

Resurging INDIA Myths & Realities



Organised by

College of Management & Computer Applications
Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India

Foreword

I am indeed glad to know that the College of Management and Computer Applications, Teerthanker Mahaveer University, Moradabad is bringing out a publication of the proceedings of the International Conference on the theme "Resurging India—Myths and Realities".

The subject chosen is highly relevant in the context of the claims that economic reforms of 1991 have resulted in accelerating the savings and investment rates for achieving sustained high growth thus leaving behind the legacy of low savings, low investment and low growth.

We have amply demonstrated our resilience to external economic shocks. India was among the best performing economies during the recent economic crisis. Our foreign exchange reserves are substantial and industry and service sectors have modernized and diversified unprecedentedly. India fastly emerging as a global centre for IT, R&D and innovations. Our financial and capital markets have become sophisticated and are capable of mobilizing and allocating resources for our investment needs. India gradually has emerged as the most preferred global destination for foreign investors. Indian companies and entrepreneurs are competing globally and are producing quality goods and services.

Expansion and increasing access to education of rural youth has enhanced their social and economic mobility and thus prosperity been extended to rural areas as well. On account of all these factors Indian economy is being projected to emerge as the third largest economy after China and Brazil in next two decades from now.

However, these tall claims are questioned on account of existence of mass poverty, hunger, disease, corruption, bottlenecks in infrastructure, low level of investment in agriculture, poor quality of education and environmental degradation.

The thorough discussion on these issues in four technical sessions viz. (i) Upcoming Technologies (ii) Economic Development (iii) Corporate Governance (iv) IT Trends by the experts from the academics and industry shall help in understanding the success achieved and the challenges being faced by India in this process of economic transformation.

The articles in the book cover the whole gamut of issues related to the conference theme. Surely the discussion during the conference shall generate sufficient inputs for the policy makers to reassess the existing economic policies and strengthen their implementation for wide spread benefits to all.

I am sure that this compendium of proceedings of the conference would be highly useful and relevant to professionals working in the industry as well as academics. I wish the conference a great success.

Prof. R.K. Mittal

*Vice Chancellor
Teerthanker Mahaveer University, Moradabad*

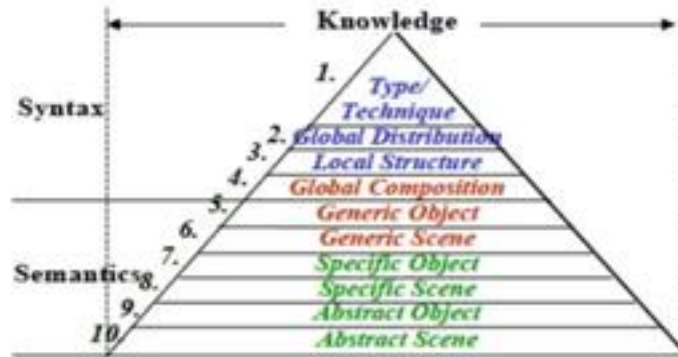


Fig. 2: Conceptual Framework for Visual Information

To address both the integrity and legitimacy issues, a wide variety of techniques have been proposed for image authentication recently. Depending on the ways chosen to convey the authentication data, these techniques can be roughly divided into two categories: *labeling-based techniques* and *watermarking-based techniques*. The main difference between these two categories of techniques is that labeling-based techniques create the authentication data in a separate file while watermarking-based authentication can be accomplished without the overhead of a separate file.

DIGITAL INTELLECTUAL PROPERTY

Information is becoming widely available via global networks. These connected networks allow cross-references between databases. The industry is investing to deliver audio, image and video data in electronic form to customers, and broadcast television companies, major corporations and photo archivers are converting their content from analogue to digital form, leading several advantages.

MAJOR COMPONENTS OF DIGITAL INFORMATION

Ecommerce

Modern electronic commerce (e-commerce) is a new activity that is the direct result of a revolutionary information technology, digital data and the Internet. E-commerce is defined as the conduct of business transactions and trading over common information systems (IS) platform such as the Web or Internet. One of these rights includes the right to exclude others from reproducing the property without authorization. The development of digital technologies permitting transmission of digital data over the Internet has raised questions about how these rights apply in the new environment.

Copyright Protection of Intellectual Property

An important factor that slows down the growth of multimedia networked services is that authors, publishers and providers of multimedia data are reluctant to allow the distribution of their documents in a networked environment. This is because the ease of reproducing digital data in their exact original form is likely to encourage copyright violation, data misappropriation and abuse. These are the problems of theft and distribution of intellectual property. Therefore, creators and distributors of digital data are actively seeking reliable solutions to the problems associated with copyright protection of multimedia data.

Digital Watermarking

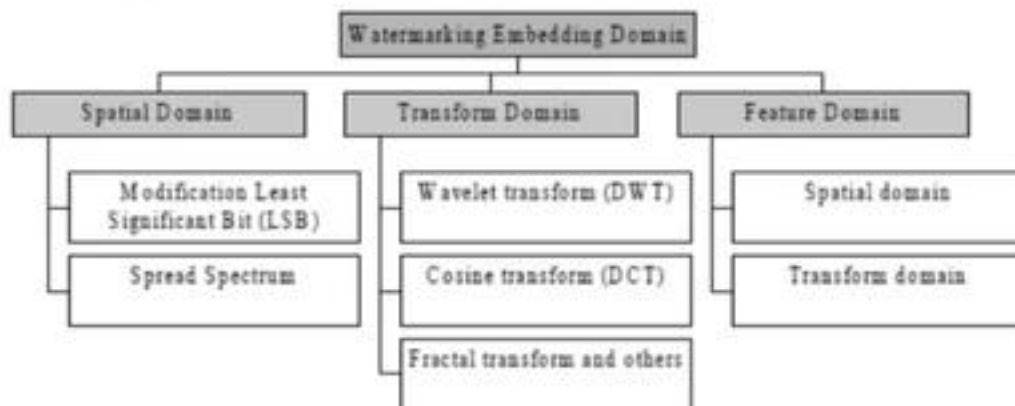


Fig. 3: Classification of Watermarking Algorithms based on Domain used for the Watermarking Embedding Process

Digital watermarking embeds a known message in a piece of digital data as a means of identifying the rightful owner of the data. These techniques can be used on many types of digital data including still imagery, movies, and music. Digital watermarking techniques derive from steganography. Watermarking approaches can be distinguished in terms of watermarking host signal (still images, video signal, audio signal, integrated circuit design), and the availability of original signal during extraction (non-blind, semi-blind, blind). Also, they can be categorized based on the domain used for watermarking embedding process, as shown in Figure 3. The watermarking application is considered one of the criteria for watermarking classification. Figure 4 shows the subcategories based on watermarking applications.

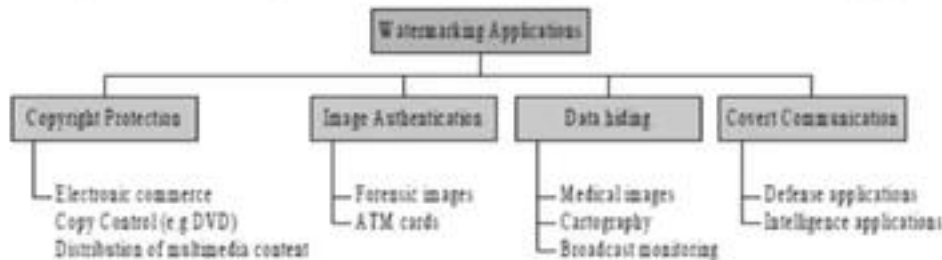


Fig. 4: Classification of Watermarking Technology based on Applications

Digital Watermarking Application

Watermarking has been proposed in the literature as a means for different applications. The four main digital watermarking applications are:

1. Copyright protection
2. Image authentication
3. Data hiding
4. Covert communication

DIGITAL WATERMARKING ALGORITHMS

Watermarking techniques are categorized into following types –

1. Spatial domain techniques
2. Transform domain techniques
3. Feature domain techniques

Spatial Domain Techniques

Many spatial techniques are based on adding fixed amplitude pseudo noise (PN) sequences to an image. PN sequences are also used as the “spreading key” when considering the host media as the noise in a spread spectrum system, where the watermark is the transmitted message. In this case, the PN sequence is used to spread the data bits over the spectrum to hide the data.

When applied in the spatial or temporal domains, these approaches modify the least significant bits (LSB) of the host data. The invisibility of the watermark is achieved on the assumption that the LSB data are visually insignificant. The watermark is generally recovered using knowledge of the PN sequence (and perhaps other secret keys, like watermark location) and the statistical properties of the embedding process. One of these, LSB-based, is a statistical technique that randomly chooses n pairs of points in an image and increases the brightness of x -coordinate by one unit while simultaneously decreasing the brightness of y -coordinate of the pixel.

Transform Domain Techniques

Many transform-based watermarking techniques have been proposed. To embed a watermark, a transformation is first applied to the host data, and then modifications are made to the transform coefficients. Three main classifications, includes wavelet based watermarking, DCT-based watermarking and fractal domain watermarking.

FUTURE OF DIGITAL WATERMARKING

Watermarking technology is still in the evolutionary stages. The watermarking future is promising. While the challenges to realization of this dream are many, a great deal of research effort has already been expended to overcome these challenges.

Development Challenges

Watermarking technology will become increasingly important as more vendors wish to sell their digital works on the Internet. This includes all manners of digital data including books, images, music and movies. Progress has been made and lots of developments and improvements have happened in the last seven years. However, despite this development and improvement in the digital image watermarking field, current technologies are far from what the end user is expecting.

Digital Watermarking and Image Processing Attacks

Digital watermarking was claimed to be the ultimate solution for copyright protection over the Internet when the concept of digital watermarking was first presented. However, some problems related to robustness and security of watermarking algorithms to intentional or unintentional attacks still remain unsolved.

Watermarking Standardization Issue

The most important question about watermarking technology is whether watermarking will be standardized and used in the near future. There are several movements to standardize watermarking technology, but no one standard has prevailed at this moment in time.

PROPERTIES & TECHNIQUES OF DIGITAL AUDIO WATERMARKING

Digital watermark is an invisible structure to be embedded into the host media. To be effective, a watermark must be imperceptible within its host, discrete to prevent unauthorized removal, easily extracted by the owner, and robust to incidental and intentional distortions. Many watermarking techniques in images and video are proposed, mainly focusing on the invisibility of the watermark and its robustness against various signal manipulations and hostile attacks. Compared with digital video and image watermarking, digital audio watermarking provides a special challenge because the human auditory system (HAS) is extremely more sensitive than the HVS (Human Video System). The HAS is sensitive to a dynamic range of amplitude of one billion to one and of frequency of one thousand to one. Sensitivity to additive random noise is also acute.

Performance Evaluation for Audio Watermarking

Digital audio watermarking can be applied into many applications, including copyright protection, authentication, trace of illegal distribution, captioning and digital right management (DRM). Since different applications have different requirements, the criteria used to evaluate the performance of digital audio watermarking techniques may be more important in some applications than in others.

Perceptual Quality

One of the basic requirements of digital audio watermarking is that the embedded watermark cannot affect the perceptual quality of the host audio signal; that is, the embedded watermark should not be detectable by a listener. This is important in some applications, such as copyright protection and usage tracking.

Bit Rate

Bit rate is a measure to reflect the amount of watermark data that may be reliably embedded within a host signal per unit of time, such as bits per second.

Some watermarking applications, such as insertion of a serial number or author identification, require relevant small amounts of data embedded repeatedly in the host signal.

Robustness

Robustness is another important requirement for digital audio watermarking. Watermarked audio signals may frequently suffer common signal processing operations and malicious attacks. Although these operations and attacks may not affect the perceived quality of the host signal, they may corrupt the embedded data within the host signal.

Security

In order to prevent an unauthorized user from detecting the presence of embedded data and remove the embedded data, the watermark embedding procedure must be secure in many applications. Different applications have different security requirements. The most stringent requirements arise in covert communication scenarios. Security of data embedding procedures is interpreted in the same way as security of encryption techniques.

ROBUST DIGITAL SIGNATURE

The digital signature method introduced by Diffie and Hellman in 1976 provides a technique to verify the integrity and the alleged source of data simultaneously. Multimedia data are usually distributed, transcoded, and reinterpreted by many interim entities (e.g., editors, agents), it becomes important to guarantee end-to-end trustworthiness between the origin source and the final recipient. Figure 5 shows a comparison of systems using traditional digital signatures (TDS) and robust digital signatures (RDS). RDS-based system reduces both the required number of trusted intermediate parties and the risk of forgery. It also verifies authenticity directly from the original machine signer, which could, in a sense, provide a proof of reality.

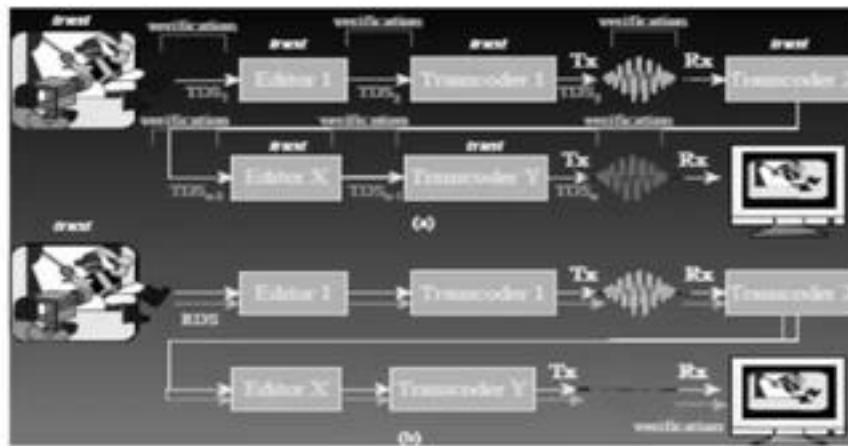


Fig. 5: Multimedia Authentication

(a) Using traditional digital signatures (TDS)—Trust all parties and verify multiple digital signatures; (b) Using robust digital signature (RDS)—Trust only the original signer and verify single signature

A simple structure of RDS algorithm is shown in Figure 6. An RDS is an encrypted form of the feature codes of the multimedia data. When a user needs to authenticate the received data, he should decrypt this signature and compare



Fig. 6: Generation and Authentication of Robust Digital Signatures

We found that some strictly quantitative invariants and predictable properties can be extracted when multimedia data was transcoded by quantization based compressions.

Given a signature derived from the original image and a JPEG compressed image bit stream, for authentication, at the first step, we have to decrypt the signature. Some parameters can be used to allow this system to be applied in various situations. For instance, we can set tolerance bounds on the authenticator to allow systems to accept some other minor manipulations, such as low-pass filtering, median filtering, and so forth. Or, multilayer feature codes can be used to increase the security and sensitivity of the system. Similar to the image authentication system, video authentication signatures that are robust to the transcoding processes can be generated. Dynamic rate shaping, rate control with/without drift error correction, consistent/ inconsistent frame types transcoding, and so forth.

MULTIMEDIA SEMANTIC AUTHENTICATION SYSTEM

A multimedia semantic authentication system architecture overview is shown in Figure 7. The system includes two parts: a watermark embedder and an authenticator. In the watermark embedding process, our objective is to embed a watermark, which includes the information of the models, such as objects, that are included in a video clip or image. We use either the automatic segmentation and classification result or the manual/semi-automatic annotation (the dotted line in Figure 7) to decide what the objects are. For the first scenario, the classifier learns the knowledge of objects using statistical learning, which needs training from the previous annotated video clips.

The classifier can learn new models or modify existing models if there is annotation associated with the new video. In this scenario, the annotation, which includes the label of regions, can be directly fed into the watermarking process. The authentication process is executed by comparing the classification result with the information carried by the

watermark. The classification result is a matrix of confidence value of each model. And the model information hidden in the watermarks can be extracted without error in most cases. Thus, the authentication alarm flag will be triggered once the confidence value of a model indicated by the watermark is under a certain threshold.

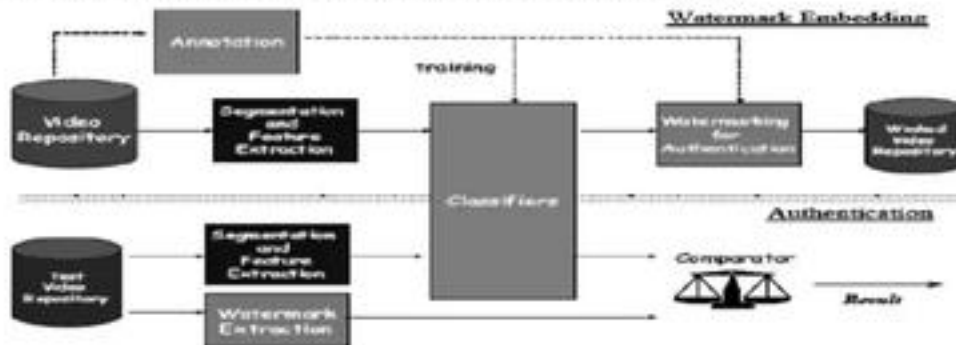


Fig. 7: Framework for Multimedia Semantic Authentication

CONCLUSION

Digital watermarking schemes can prove to be a valuable technique for copyright control of digital material. Different applications and properties of digital watermarks have been reviewed in this chapter, specifically as they apply to digital audio. However, a problem arises as different claims are made about the quality of the watermarking schemes being developed; every developer measures the quality of their respective schemes using a different set of procedures and metrics, making it impossible to perform objective comparisons among their products.

Under the quick evolution of image processing techniques, existing digital signature-based image authentication schemes will be further improved to meet new requirements. New requirements pose new challenges for designing effective digital signature-based authentication schemes. These challenges may include using large-size authentication code and tolerating more image-processing operations without compromising security. This means that new approaches have to balance the trade-off among these requirements. Moreover, more modern techniques combining the watermark and digital signature techniques may be proposed for new image authentication generations.

REFERENCES

- [1] Barni, M., Bartolini, F., Cappellini, V., & Piva, A. (1997). Robust watermarking of still images for copyright protection. 13th International Conference on Digital Signal Processing Proceedings, DSP 97, (vol. 1, pp. 499–502).
- [2] Cox, I., & Miller, L. (1997, February). A review of watermarking and the importance of perceptual modeling. Proceeding of SPIE Conference on Human Vision and Electronic Imaging II, 3016, (pp. 92–99).
- [3] C. Kurak and J. McHugh, "A Cautionary Note On Image Downgrading," Proc. IEEE Eighth Ann. Computer Security Applications Conf., IEEE Press, Piscataway, N.J., 1992, pp. 153–159.
- [4] I.J. Cox et al., "Secure Spread Spectrum Watermarking for Multimedia," Tech. Report 95-10, NEC Research Inst., Princeton, N.J., 1995.
- [5] Turner, L.F. (1989). Digital data security system, Patent IPN WO 89/08915. Wolfgang, R.B., & Delp, E.J. (1996). A watermark for digital images. Proc. IEEE Int. Conf. On Image Processing, (vol. 3, pp. 219–222).
- [6] Xu, C., Zhu, Y., & Feng, D. (2001b). A robust and fast watermarking scheme for compressed audio. IEEE International Conference on Multimedia and Expo, pp. 253–256, Tokyo, Japan.
- [7] Yardimci, Y., Cetin, A.E., & Ansari, R. (1997). Data hiding in speech using phase coding. ESCA, Eurospeech97, Greece, pp. 1679–1682.
- [8] <<http://www.cs.bham.ac.uk/~mdr/teaching/modules03/security/students/SS5/Steganography.pdf>>.

Implication of Information Technology for Teacher Education

Jyoti Puri

Faculty of CMCA, TMU MBD

Abstract—A nation's development potential depends upon its ability to continuously educate its population and create armies of skilled manpower. In particular, use of information technology (IT) in acquiring knowledge and skills has become an essential element in education and training. Various education commissions and a number of expert committee have discussed the aims of teacher education in India. Unfortunately, barring a few exceptions, our universities and institutions of higher learning have largely not been able to live up to these great expectations. This article asserts that teacher education must model the integration of IT throughout the teacher education programme. Information and communication technology (ICT) integrated teacher education is more important to Indian education system that is committed to maintain global partnership as well as leadership in knowledge-based society. IT as a subject is being taught to the trainee-teachers to provide them basic knowledge about it, to make them learn information processing tools and techniques, to make them understand IT applications in various domains of business and to develop IT vocational appreciation. To meet the challenges strong leadership from the university administration, external funding, technical support for faculty and students, incentives and recognition for faculty continue to be foundational elements for a program that effectively integrates technology into the preparation of new teachers. Unless substantial effort is made on the part of universities, teacher educators and trainees alike will be deprived of the joy of using IT.

Keywords: Information and communication technology, Universities, knowledge etc

INTRODUCTION

A nation's development potential depends upon its ability to continuously educate its population and create armies of skilled manpower. In particular, use of information technology in acquiring knowledge and skill has become an essential element in education and training. These IT elements in the educational process have magical effects.

Various education commissions and a number of expert committee have discussed the aims of teacher education in India. Unfortunately, barring a few exceptions, our universities and institutions of higher learning have largely not been able to live up to these great expectations. On the contrary, they have just become bodies for conducting stereotyped examinations and degree-awarding centres. The quality and reliability of such exams and degrees is also sometimes questionable. One of the main reasons is the inadequate academic, professional and pedagogic preparation and insufficient level of knowledge and the skills of the faculty. Besides this, traditional versus modern methods of teaching, outdated knowledge and information and lack of skills, teachers attitude, aptitude and authenticity of their sources of knowledge are some of the other core issues.

In present scenario, teachers need to help their students in: how to learn, how to grow in future, how to develop study skills, how to conduct fundamental research, how to examine, evaluate and assess information and also how to question and then dismantle unauthentic structure of knowledge and cognition if need be. This is necessary if the teachers really want to survive in the ICT savvy world of education. All these expectations may be met only through need-based, goal-oriented and meaningful in-house discussion, conferences, symposia, workshops, refresher and orientation courses, crash courses, capsule courses and subject-based courses, interdisciplinary and holistic approaches to education and quality research and by enriching the existing libraries and making use of the user-friendly ICT with contextually appropriate and firm pedagogical scaffolding. The teacher educators and individual teacher ought to sincerely and persistently work hard toward this goal. According to Verma (2010), a teacher plays a significant role not only in class teaching learning situation but in social engineering too. Society gives a respectable place to teachers who are really perspective empowered. This empowerment is not at in terms of physical perspective. It is in academic, intellectual, social, and national perspectives.

CONCEPT OF INFORMATION TECHNOLOGY

Information technology implies telecommunications involving a combination of computers, networks, satellites, telephones, radio, television and the like. IT resources involve not only hardware (equipment) but also software (programmes), people, education, government and association/collaboration resources. Application of IT to education involves many discipline related to computers in handling, processing, management, automation and communication of information in the broader culture and economic context of a society.

IT with reference to "technology in education" encompasses one or more of the following:

- Media and AV communication, e.g. alternative instructional delivery system such as Radio, ETV, etc.
- Vocational training tools, such as CBT (Computer - Based Training), CAD (Computer - Aided Design), etc.
- Computer and computer - based systems for instructional delivery and management, e.g. CAI (Computer Assisted Instruction) etc.
- Internet/web - based education e.g. not only educational information with text, graphics, and video but also courses offered by various websites.

While IT refers primarily to the components of media, computer tools and instructional uses of computer-based system, Instructional Technology lies at the core as the starting point.

FUTURE OF ICT IN TEACHER EDUCATION

The role of interactive multimedia in a perspective where learning is part of schooling, working or just living. ICT also includes web TVs, Net PCs, and Web-Based Education that offers accessibility, flexibility and innovativeness in teaching and learning. ICT integrated teacher education is more important to Indian education system that is committed to maintain global partnership as well as leadership in knowledge-based society.

Prof Ram Takwle (2003) says about IT driven education: "They are changing the methods of content generation, content storage, content packaging and content delivery and hence offer a new paradigm of education." These multimedia programs and packages are also intended to supplement the real classroom activities and help their easy assimilation. ICT especially in the 21st Century context of teacher education fulfils the following objectives:

- It envisages excitement to the learner's eyes, ears, and more importantly the head;
- ICT fulfils the needs of learners by providing items and packages of higher standard and interest;
- It helps in transforming the definition of literacy, learning and knowledge; a definition that increasingly includes multimedia digitized literacy;
- Multimedia provides a kind of control over the learning environment to the pupil teachers and they experience learning from their failures and I practices;
- ICT facilitates the learner to have control on lesson, pace the sequence, content, feedback, which in turn enhances the efficiency of learning;
- Unlike books, it is interactive in nature and creates motivation and interest among the learners, in turn meeting the individual unique needs effectively and efficiently;
- Develops the ability of self-learning and interacting individually, as the learner attains vast experiences effectively, efficiently and expeditiously;
- ICT-empowered simulated situation minimizes dangers in the real world' e.g. practical in science, pilot training driving etc;
- ICT is a powerful new development with ambitious role in teacher present's trend in the field. It takes just a computer to play multitude of media enabled programs and packages.

UNIVERSITY ROLE IN TRAINING ON ICT

What are universities doing to popularize ICT among students of education? It is difficult to compare one university with another in this regard as there is a great variation in philosophy, strategy, and funding among the universities, particularly in teaching education. However, universities involved in preparing teachers, are supposed to apply ICT in effective classroom transaction, storage, retrieval of information and evaluation. This is applicable equally for pre-service teacher training, as well as continuing education for teachers.

It is argued by some that the most important thing the university can do for pre-service and in-service teachers is to help them understand the implications of technology developments in general on the perspectives and lifestyles of aspiring teachers. That is, the university ought to teach aspiring teachers ICT as content as well as IT as instructional tool. Underlying this perspective of IT as content is the belief that IT developments are bringing about not simply evolutionary changes in society, but also profound and revolutionary changes.

At the moment, technology in many schools and colleges means computer technology. In the recent past technology meant television or language laboratories. From today's perspective, it appears that new information technology systems, i.e. multimedia, telecommunication, videoconferencing, computer conferencing and the like are becoming more pervasive and providing these new technology systems is likely to require new kinds of skills on the part of students seeking to use them, this in turn will require new skills on the part of teachers to manage the technologies as important components of teaching and learning environments.

INFORMATION TECHNOLOGY CURRICULUM FOR TRAINEE-TEACHERS

In professional courses for teaching (B.ed and M.ed) IT is being taught to the trainee-teachers as a subject in their curriculum. The general objectives of teaching this subject are:

- To acquire basic knowledge of IT;
- To learn information processing tools and techniques;
- To understand IT applications in various domains of business;
- To develop IT vocational appreciation.

The curriculum should address the need of practicing teacher. She/he must have:

- Positive attitude towards IT;
- Ability to promote ethical and legal behaviour in the use of IT for school and home use;
- Ability to meet all basic hardware knowledge and use requirements specified in the classroom;

- Ability to apply technology tools to solve a variety of problems for teaching and learning with technology;
- Ability to make decisions regarding the use of specific technologies based on empirical research on learning effectiveness;
- Ability theories of learning to create instructional courses using a selected authoring tool;
- Ability to conduct research on the effectiveness of instructional technology on specified variables of interest for learning strategies to further the field of IT, and ability to attain a minimum technical ability, etc.

FACULTY DEVELOPMENT FOR TEACHER EDUCATORS

The reality is this, that the bulk of faculty currently engaged in teacher preparation are themselves neither prepared to use technologies, nor have updated their knowledge in technology developments. Once again there are notable exceptions to this generalization. For most faculties in teacher education, however, IT is a mystery or a blur. Young students being prepared by these members of faculty, in an increasing number of cases, are somewhat knowledgeable about IT due to imports from this environment: as intellectual gap of some importance is thus being created. Can universities meet the challenge?

Most members of faculty are yet appreciated the use of technology for the delivery of instruction. The following are the benchmarks to assist in the development of faculty knowledge, skill and ability:

- Ability to master basic IT skills in the area of productivity, multimedia, telecommunication and classroom integration;
- Ability to use multimedia as a medium for delivery of class lectures;
- Ability to guide students to work collaboratively to make group presentation using IT;
- Ability to enthuse students to use IT for problem solving task;
- Ability to introduce new interactive learning package in content related courses relevant to teaching and learning, etc.

Teacher education programmes can be major catalysts for educational reform by preparing pre-service and in-service teachers to effectively use IT in classroom through specialized pre-service courses and in-service training. Teacher education must model the integration of IT throughout the teacher education programme.

WHAT NEEDS TO CHANGE IN TEACHER PREPARATION?

It is not simply a matter of adding technology to conventional practices in teacher preparation programs to achieve the goal of technology integration. According to Salomon, Perkins & Globerson- "No important impact can be expected when the same old activity is carried out with a technology that makes it a bit faster or easier; the activity itself has to change, and such a change cannot take place in a cultural vacuum" Educational stakeholders, especially teacher educators need to change how they approach and use ICT, change the routines (e.g., ICT as an elective, taught in isolation), change how they and the pre-service teachers think about teaching and learning with technology and change the pedagogical approach in relation to technology use. Jacobsen, Clifford and Friesen claim, "Learning how to teach and learn in new ways with technology requires imagination, intellect, creativity, and no small courage".

Fulton, Glenn and Valdez from their investigation into how teachers are prepared to effectively use technology in classrooms found the following:

To meet the challenges of supporting necessary changes, one strategy is to create an infrastructure framework to guide the conceptualization, implementation and institutionalization of such an approach to technology integration. In their examination of ICT in European countries, Hakkarainen, Lakkala, Rahikainen, Seitamaa-Hakkarainen and Leinonen (2001) found that fostering pedagogical and cultural changes within institutions and with individuals is difficult and requires time. They found the challenge could be met by creating four infrastructures of change:

1. Technical infrastructure - Access to new and emerging technologies and for educators to have the necessary ICT skills set;
2. Pedagogical infrastructure - Pedagogical models to guide meaningful learning with technology through such strategies as problem solving, collaboration, and inquiry;
3. Social infrastructure – New technology should be a core component used in the educational process; and
4. Epistemological infrastructure – Educational stakeholders need to develop greater epistemological awareness to foster greater appreciation and understanding of the value of deep inquiry.

In many situations, they found that the absence of some of these factors had a negative impact on the implementation of ICT. Therefore, stakeholders who are working to foster change in the integration of ICT need to carefully consider elements of each infrastructure framework and use that framework to guide the change process.

CONCLUSION

Now the concept of teaching and learning has changed totally. Higher education without the support of IT makes the lives of learners and teachers equally difficult. ICT can help the students and the teachers to access vast knowledge to solve complicated problems. It also provides them new tools to present their knowledge with different text, images, graphics and video. The role of ICT in teacher education is to equip new generation of teachers with knowledge of new learning methods as well as new materials for learning. It would require a significance commitment from the administration of universities to provide training and resources for trainee teachers and faculty staff. Unless substantial effort is made on the part of universities, teacher educators and trainees alike will be deprived of the joy of using IT.

REFERENCES

- [1] Ahmed, S. and Singh, M.(2010) Multimedia in Teacher Education Empowering Accessible,
- [2] Flexible and innovative learning, Shikshak-Shiksha Shodh Patrika Vol. (04) No (1) pp. 32-33.
- [3] Chaudhari P.T. (2004) "On line Education and Training", Shri Nivas Publication, Jaipur.
- [4] Dr. T.M. Geeta. " Role of ICT in Teacher Education".
- [5] Paliwal A.K. (2006).Faculty development in teacher education perceptions and changing context, soviniar 7th National conference MATE pp 10-11.
- [6] Sagar Krishna : "Digital Technology in Education, Author Press New Delhi, 2004
- [7] Takwal, R. (2003) Problems and Issues faced by Indian Education system UGC Golden Jubilee Lecture series. pp.5.
- [8] Venna S.K (2010) Teacher Education some qualitative consideration, Shikshak-Shiksha Shodh Patrika vol (04) NO (1) pp. 10.
- [9] <<http://www.ncert.org>>
- [10] <<http://www.teachereducation.com>>

Stochastic Linear Controlled Models

Puneet Sethi
CMCA, TMU, MBD

Abstract—This paper discusses the design of Central Laws for time invariant, linear system with probabilistic model uncertainty, under stationary Stochastic extinction. The specific model and extinction choices are motivated by their familiarity in the central literature and the desire to compare the proposed stochastically-robust-to- uncertainties methodology to other standard controller synthesis approaches. If the asymptotic approximation is used, then the stochastic programming problem is solved by the simultaneous optimization for all the design points and the optimal design variables, the efficiency of this approach depends on the accuracy of the asymptotic approximation, particularly close the optimal solution. If the accuracy is high or the approximation yields a consistent estimation error, then the identification of the optimal design configuration will be accurate. Unfortunately, though, the accuracy of the asymptotic approximation cannot be typically known a priori.

Keywords: Stochastic programming, Linear Programming, Optimization technique.

STOCHASTIC LINEAR CONTROLLED MODELS

This paper discussed the design of control laws for time invariant, linear systems with probabilistic model uncertainty, under stationary stochastic excitation. The specific model and excitation choices are motivated by their familiarity in the control literature and the desire to compare the, proposed stochastically-robust-to- uncertainties methodology to other standard controller synthesis approaches. Because of the linearity and stationary assumption, the system performance can be analytically evaluated. Contrary to simulation methods, this approach allows for efficient optimization and gives valuable insight into the theoretical characteristics of the problem. In terms of actuator characteristics, the linearity requirement restrict the design to control applications that are passive or active, or may be modeled as such for design purposes.

Estimation of Stochastic Integrals and Stochastic Optimization for Simple System Models

Frequent use is made in this paper of stochastic integrals of the form:

$$E_{\theta}[h(K, \theta)] = \int_{\Theta} h(K, \theta) p(\theta) d\theta \quad (1)$$

where (i) the performance measure $h(K, \theta)$ can be analytically evaluated, rather than obtained through computer simulation, (ii) the dimension of the uncertain parameter vector, θ , is relatively small, and (iii) the integrand corresponds to a smooth function. The estimation of such integrals can be performed efficiently if all local maxima, or at least the global maximum, of the integrand can be identified, since it is expected that the bigger contribution to the integral will come from the region in Θ close to those maxima. Thus, evaluation of the integral in these regions leads to estimation of (1). Two different methods are presented next for this estimation; one based on an asymptotic approximation, and the other based on stochastic simulation. The requirements about the analytical form, the smoothness of the function $h(K, \theta)$ and the dimension of the uncertain parameter vector are related to efficient numerical optimization for identification of the maxima of the integrand.

ASYMPTOTIC APPROXIMATION

For the estimation of stochastic integrals like the one in (1), Papadimitriou et al. (1997) derived an analytical approximation, which is based on Laplace's asymptotic method and which entails fitting a Gaussian distribution to the integrand at its global maximum denoted, θ^* . The integral is approximately:

$$\int_{\Theta} h(K, \theta) p(\theta) d\theta \approx (2\pi)^{n/2} \frac{h(K, \theta^*) p(\theta^*)}{\sqrt{\det\{H_s(K, \theta^*)\}}} \quad (2)$$

where $H_s(\theta^*) = -\nabla_{\theta} \nabla_{\theta} s|_{\theta=\theta^*}$ is the negative of the Hessian matrix of $s(\theta)$, evaluated at θ^* , where s is the log of the integrand:

$$s(\theta) = \log p(\theta) + \log h(K, \theta) \quad (3)$$

The expression in (2) is a reasonable approximation for the case where the integrand is concentrated in a single region in Θ , with one maximum. However, in many cases there may be many prominent local maxima, called design points. In such cases, a better approximation can be obtained by conducting asymptotic expansions like (2) at each design point, with the integral in (1) then approximated as the summation of these expansions (Au et al. 1999). The identification, though, of all design points and the calculation of all second-order derivative information can be a time consuming task when the space of the uncertain parameters is large.

The accuracy of the estimation in (2) depends on the (a) estimation error related to the asymptotic characteristic of the approximation, and (b) the error in identifying the exact location of the local minima and evaluating the Hessian matrix at these points. The latter error can be important when analytical forms are not available for the first- and second-order derivatives of the integrand with respect to θ . In such cases numerical differentiation is needed for obtaining the relevant information, a task which is often numerically unstable and typically computationally expensive. This characteristic can reduce the accuracy of the asymptotic approximation in (2).

STOCHASTIC OPTIMIZATION

The methods discussed previously for evaluation of stochastic integrals can be implemented for estimating the performance objective and efficiently performing the associated design optimization for stochastic design problems.

If the asymptotic approximation is used, then the stochastic programming problem is solved by the simultaneous optimization for all the design points and the optimal design variables. The efficiency of this approach depends on the accuracy of the asymptotic approximation, particularly close to the optimal solution. If the accuracy is high or the approximation yields a consistent estimation error, then the identification of the optimal design configuration will be accurate. Unfortunately, though, the accuracy of the asymptotic approximation cannot be typically known a priori. On the other hand the stochastic simulation approach is characterized by greater robustness and can lead to more reliable identification of the optimal solution, though at a greater computational cost. This approach suffers additionally from the existence of an estimation error as discussed in Section 2.1. The technique of selecting Common Random Numbers (Spall 2003) for the random samples may be implemented for reducing the variance of different estimates and thus increasing the computational efficiency of the optimization algorithm used.

Finally the methods considered here for evaluation of the stochastic integral require the identification of the design points of the integrand. In the context of a stochastic optimization algorithm, the location of the design points at the current iteration of the optimization algorithm can be used as initial guesses for subsequent iterations. If the design configurations compared between the different iterations are not far away from each other this approach is expected to yield a significant improvement in computational efficiency.

REFERENCES

- [1] Au, S.K., and Beck, J.L., 1999. A new adaptive importance sampling scheme, *Structural Safety*, 21, 135–158.
- [2] Au, S.K., Papadimitriou, C., and Beck, J.L., 1999. Reliability of uncertain dynamical systems with multiple design points, *Structural Safety*, 21, 113–133.
- [3] Au, S.K., and Beck, J.L., 2001a. Estimation of small failure probabilities in high dimensions by subset simulation, *Probabilistic Engineering Mechanics*, 16, 263–277.
- [4] Au, S.K., and Beck, J.L., 2001b. First-excursion probabilities for linear systems by very efficient importance sampling, *Probabilistic Engineering Mechanics*, 16, 193–207.
- [5] Au, S.K., 2005. Reliability-based design sensitivity by efficient simulation, *Computers and Structures*, 83, 1048–1061.
- [6] Beck, J.L., and Au, S.K., 2002. Bayesian updating of structural models and reliability using Markov Chain Monte Carlo simulation, *Journal of Engineering Mechanics*, 128(4), 380–391.
- [7] Field, R.V., and Bergman, L.A., 1998. Reliability-based approach to linear covariance control design, *Journal of Engineering Mechanics*, ASCE, 124(2), 193–199.
- [8] Gasser, M., and Schueller, G.I., 1997. Reliability-based optimization of structural systems, *Mathematical Methods of Operations Research*, 46, 287–307.
- [9] Kim, Y.S., and Wang, K.W., 1993. On the sliding mode control of structural vibrations via variable damping, *Mechanical Systems and Signal Processing*, 7(4), 335–347.
- [10] Papadimitriou, C., Beck, J.L., and Katafygiotis, L., 1997. Asymptotic expansions for reliabilities and moments of uncertain dynamic systems, *Journal of Engineering Mechanics*, 123, 1219–1229.
- [11] Papadimitriou, C., Beck, J.L., and Au, S.K., 2000. Entropy-based optimal sensor location for structural model updating, *Journal of Sound and Control*, 6, 781–800.
- [12] Papadimitriou, C., Beck, J.L., and Katafygiotis, L.S., 2001. Updating robust reliability using structural test data, *Probabilistic Engineering Mechanics*, 16, 103–113.
- [13] Rosenbrock, H.H., 1966. On the design of linear multivariate control systems, *Preprints 1966 JACC*, Session 1, Paper 1A.
- [14] Scruggs, J.T., 2007. Multi-objective performance-guaranteed control of semiactive and regenerative systems, *Proceedings of the 18th Engineering Mechanics Division Conference of the ASCE*, June 3–6 Blacksburg, Virginia.
- [15] Scruggs, J.T., Taflanidis, A.A., and Iwan, W.D., 2007a. Non-linear stochastic controllers for semiactive and regenerative systems with guaranteed quadratic performance bounds-Part 1: State feedback control, *Structural Control and Health Monitoring*, 14(8), 1101–1120.
- [16] Scruggs, J.T., Taflanidis, A.A., and Iwan, W.D., 2007b. Non-linear stochastic controllers for semiactive and regenerative systems with guaranteed quadratic performance bounds-Part 2: Output feedback control, *Structural Control and Health Monitoring*, 14(8), 1121–1137.
- [17] Spall, J.C., 2003. *Introduction to stochastic search and optimization*, Wiley-Interscience, New York.
- [18] Taflanidis, A.A., and Beck, J.L., 2006a. Analytical approximation for stationary reliability of certain and uncertain linear dynamic systems with higher dimensional output, *Earthquake-Engineering and Structural Dynamics*, 35, 1247–1267.
- [19] Taflanidis, A.A., and Beck, J.L., 2006b. Reliability-based optimal design by efficient stochastic simulation, *Proceedings of the 5th International Conference on Computational Stochastic Mechanics*, June 14–16, Rhodes, Greece.
- [20] Taflanidis, A.A., Scruggs, J.T., and Beck, J.L., 2006. Reliability-based performance objectives and probabilistic model uncertainty in optimal structural control, *Proceedings of the 4th World Conference on Structural Control and Monitoring*, July 11–13, San Diego, California.
- [21] Taflanidis, A.A., and Beck, J.L., 2007b. Stochastic subset optimization for stochastic design, *Proceedings of the ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*, June 13–16 Rethymno, Greece.

Impact of Information Technology on Business

Rakhi Garg

*Assistant Professor, Computer Science, MMV
Banaras Hindu University, Varanasi*

Abstract—Information technology has changed traditional business system entirely. With the advent of IT, everything is just a mouse click away and is available anytime, anywhere. IT has speed up communication between executives by providing online meeting irrespective of their location. IT also contributes to an organization's success by providing information that provides innovative ideas to managers and helps them in decision making which is very important to keep the organization ahead in this competitive world. Financial, trading, manufacturing, retail industries etc. are moving towards a real time business model where transaction and information sharing are near instantaneous. Obtaining full competitive advantage from IT requires long term investment in an IT strategy that supports the manager's strategic direction. It is not simply one time heavy investment in one or more business applications but is continuous in the areas where it can show remarkable growth.

Keywords: Data Mining, Knowledge management, Data Warehousing, E-commerce, Internet, IT, KDD.

INTRODUCTION

In this era of technology and competition, business people are looking for innovative ideas and information that can boost their business. In doing this they are becoming more and more dependent on information technology. IT is used in every aspects of business right from customer relationship management, marketing strategies, retailing, communication, product promotion, product development, forecast future sales to supply chain management etc. ERP, SAP, Data Mining tools, EDI, Data warehouse, Business intelligence, internet, intranet, extranet, MIS etc. are the software's and packages that support managers in every step of business.

IT has speedup the whole process of the business e.g. Instead of gathering data manually and taking out hidden information from it by conducting meeting of executives which is crucial in decision making for marketing strategies, CRM etc., the same can be obtained by using the respective data mining tools and data warehouse. Not only this, IT also provide new platform to business world where space and time is no more obstacle i.e. internet can be used in advertising, marketing.

Because of internet small companies has opportunity to compete against large companies. E-commerce provides buying, selling and exchanging of products, services and information between Business to Business, Business to Customer, Customer to Business and Customer to Customer via computer networks. By having online advertising the company is in a reach of broad number of customer to enhance sale. Currently \$80 billion is traded over internet annually and by the year 2030; the number is estimated at \$4 trillion [2].

In today's competitive and unpredictable business environment, only those organizations survive which have complete information and knowledge of customer buying habits and market strategy. Knowledge management enhances an organization ability and capacity to deal with and develop in mission, competition, performance and change. Data mining software allows users to analyze large databases to solve business decision problems.

This paper is divided into 5 sections. The theme of the paper is discussed in section 1, role of IT in different management levels of an organization as well as in business is discussed in section 2, applications of various IT tools in business is discussed in section 3. In section 4, data mining and knowledge management concepts and their applications in business are discussed and at last conclude.

ROLE OF IT IN BUSINESS

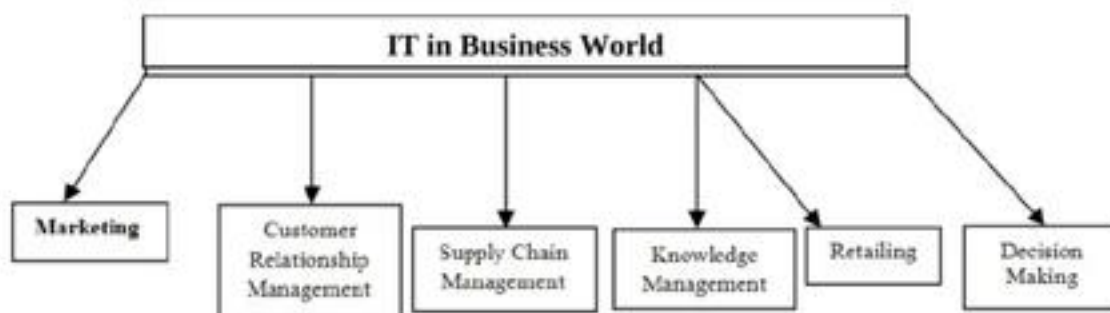


Fig. 1: Application of IT in Different Fields of Business

IT refers to the technology of the production, storage and communication and management of information using computers and micro-electronics. Most business uses IT to create and process data. Small businesses generally need to

purchase software packages, and may need to contract with IT businesses that provide services such as hosting, marketing web sites and maintaining networks. However, larger companies can consider having their own IT staffs to develop software, and otherwise handle IT needs in-house [3]. IT has changed the working styles of staff at all levels of organizations, from the executives to middle management and clerks. The prime areas where IT enabled tools are used in any organization is shown in figure 1 whereas figure 2 shows different IT enabled tools used in three i.e. top, middle and lower management of an organization.

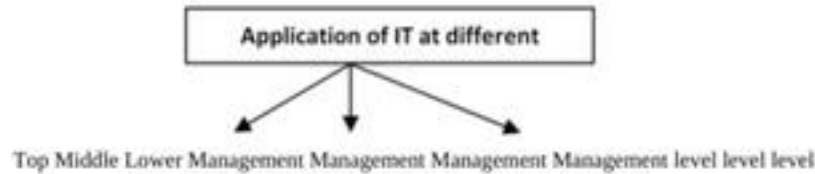


Fig. 2: IT at Three Different Management Levels

In a global survey conducted by Economist Intelligence Unit, Global Technology Forum survey, 2006 of 4,018 executives conducted for the report, 59% agreed that IT's primary role in five years' time will be to increase competitive advantage rather than drive cost efficiency. Executive confidence in this development has clearly grown since the *Business 2010* [1].



Fig. 3: Shows IT's Role in Helping a Company to Achieve its Strategy Goals in 2006 and what will it be in Three Years? (% Respondents) [1]

IT assists organisations in many ways, such as strategic decisions, timeless, reliability, allows the employee to work. According to survey conducted [1] to what extent do a company's IT capabilities (applications, hardware, IT staff and organisation) currently enable the achievement of its key business objectives today? The percentage of respondents in different fields can be seen from figure 4, published a report from the Economist Intelligence Unit sponsored by Capgemini, Cisco Systems and SAP in The Economist Intelligence Unit 2006.

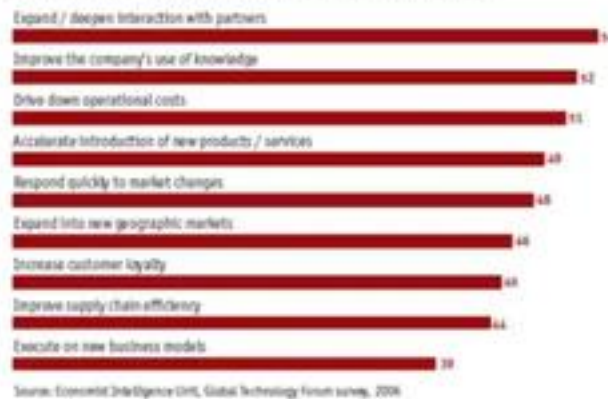


Fig. 4: Shows the Percentage of Respondents in Different Fields that Apply IT to Achieve their Objective [1]

Andrew McAfee from Harvard Business School and Erik Brynjolfsson from MIT's Sloan School of Management have divided the US private sector into 61 industries and determined the IT intensity of each one by the amount of spending on computer hardware and software as a percentage of total spending on fixed assets, grouping them into high-IT, medium-IT, and low-IT industry groups [4]. They found that "Market share increases were greatest in industries that used IT most extensively. High-IT industries experienced different competitive dynamics than other industries." Sales turbulence (i.e., the amount of shifting in where a company ranks in sales within an industry from year to year) was substantially higher in the high-IT industries than in the other two categories [3].

IT TOOLS USED IN BUSINESS

Now day's business uses IT to carry out basic functions including systems for selling items, capturing the sales data by item, stock control, buying, management reports, customer information, decision making, accounting etc. Here we discuss some of the IT tools crucial for business growth.

Business Website

By having this organisation/business becomes reachable to large amount of customer. Not only can this it also be used in an advertisement which is cost effective and in customer relationship management.

Internet and Intranet

It's a best source of communication. Time and space is no more obstacles for conducting meeting of people working in a team from multiple locations, or with different vendors and companies. E-commerce among partners (suppliers, wholesalers, retailers, distributors) using intranets, EDI, e-mail etc. provides new platform to the business world for conducting business in a faster and easier way.

E-commerce provides business to business, business to customer, customer to customer and customer to business communication with a click of mouse.

Software and Packages

DBMS, data warehousing, data mining tools, knowledge discovery can be used for getting information that plays important role in decision making that can boost the business in the competitive world. e.g. by having information of buying habits of customer, sales of product; marketing strategy can be built quickly and effectively with the use of data mining tools and KDD. These can be used in Supply chain logistics, including planning, purchasing, replenishment, logistics, and space management. Now progressively firms are replacing legacy systems with newer client/server based solutions. Data warehousing, data mining tools and knowledge discovery (KDD) applications for analysis of market baskets, customer profiles and sales trends can be used in retailing. ERP, SAP, MIS, antivirus software, Tally packages not only increases processing speed but also cut cost of hiring more employees.

Computer systems, scanners, laptop, printer, webcam, smart phone etc.-

Webcam, microphone etc. are used in conducting long distance meeting. Use of computer system, printer, scanner increases accuracy, reduce processing times, enable decisions to be made more quickly and speed up customer service. e.g. one can charge accurate prices and eliminates the need to apply price labels to individual items by the use of scanning system.

KNOWLEDGE MANAGEMENT & DATA MINING

Because of globalization and the advent of high storage computers, huge amount of data is available. The major problem is the ability to analyze and understand massive datasets. Data is simple, indisputable facts while information is obtained after processing these facts. *Knowledge is information that is contextual, relevant and actionable* [9]. Knowledge is still valuable or reusable after lapse of time and has historical relevance, while the value of information tends to decline with time without preservation of the context in which it was acquired. Over time, information accumulates while knowledge evolves [9]. The collection of data is not information and collection of information is not knowledge. Information relates to description, definition, or perspective (what, who, when, where). Knowledge comprises strategy, practice, method, or approach (how) [5]. Data is facts or values of results, and information is the relations between data and other relations whereas the knowledge is the patterns of relations of data and information and other patterns. The relation between data, information and knowledge is shown in the figure 5.

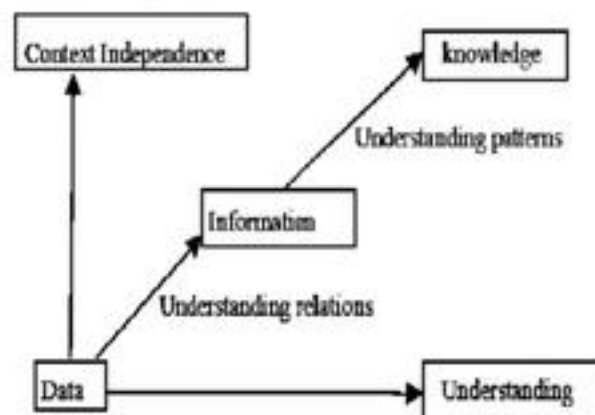


Fig. 5: Shows the Relation between Data, Information and Knowledge [5]

Knowledge management is getting right information at the right time to the right people so that they can share knowledge and act upon the information to increase the performance of the system. The key objective of knowledge management is to increase employee's capabilities, process improvement, transfer of best practice, customers market

information, customer relation management, new product development, opening new market, leverage intellectual, starting new business. Knowledge is a strategic resource that helps business in achieving long term objectives and goals [9]. In today's competitive and unpredictable business environment, only those organizations survive which have complete information and knowledge of customer buying habits and market strategy. Knowledge management enhances an organization ability and capacity to deal with and develop in mission, competition, performance and change. Knowledge Management is important as the managed knowledge enables the members of the organization to deal with today's situations and effectively envision and create their future [9]. It involves coordination between people, process and technology. Knowledge management is the art of performing *knowledge actions* such as organizing, blocking, filtering, storing gathering, sharing, disseminating and using *knowledge objects* such as data, information, experiences, evaluations, insights, wisdom and initiatives. In general terms it is the performance of knowledge actions on knowledge objects [10] as shown in the Figure 6 [9].

Table 1

Knowledge management = Knowledge Actions × Knowledge Objects		
The art of performing knowledge actions on knowledge objects ...	Organizing, storing, gathering, sharing, disseminating, using	Data, information, experience, evaluations, insights, wisdom,....

Fig. 6: Knowledge Management [9,10]

A computational techniques and tools is required to extract the useful knowledge from the rapidly growing volumes of data which are the subject of the emerging field of knowledge discovery in databases and data mining.

Data mining software allows users to analyze large databases to solve business decision problems. Data mining refers to extracting or mining knowledge from large amounts of data [6]. Data mining is the technique that finds hidden patterns in huge database which can be used in decision making. Data mining is different from database because database will list out the customer who have purchased computer in a year whereas data mining find out all the items that are purchased with computer. It is the extraction of interesting (non-trivial, implicit, previously unknown and potentially useful) information or patterns from data in large databases [7]. Data mining tools are already used in marketing as they helped managers in decision making, bioinformatics, medical etc. Various data mining tools available are DB Miner, Multimediaminer, Web Logminer, IBM Intelligent Miner, Max Miner etc. Data mining is simply a step in the process of knowledge discovery in databases (KDD) [6]. KDD process consists of following sequence of steps [6]:-

1. Data cleaning- It involves removal of noise and inconsistent data.
2. Data integration- It involves the collection of multiple data sources.
3. Data selection-It involves the retrieval of data relevant to the analysis task from the database.
4. Data transformation- It involves the transformation of data into forms appropriate for mining by performing summary or aggregation operations for instance.
5. Data mining-It involves the application of intelligent methods for extraction of hidden data patterns.
6. Pattern evaluation- it involves the identification of the truly interesting patterns representing knowledge based on some interestingness measures.
7. (vii)Knowledge representation- It involves the visualization and knowledge representation techniques are used to present the mined knowledge to the user.

Different data mining tasks are dependency identification (done by association rule mining), class identification (done by clustering), concept description, deviation detection and data visualization. Different data mining tasks are grouped into categories depending on the type of knowledge extracted by the tasks. The identification of patterns in a large data set is the first step to gaining useful marketing insights and making critical marketing decisions [8]. The data mining tasks generate collection and a range of customer and market knowledge that is used by knowledge management process [8]. e.g. Association rule mining is used in market basket analysis i.e. to find the association between the products that helps in predicting the buying habits of the customer. Classification and clustering can be used in finding similar type of customers.

CONCLUSION

Although IT has set high hopes to companies for their growth as it reduces processing speed and helps in cutting cost but in reality it's not true because most of the research shows that there is a mark able gap between IT capabilities and the business-related demands that senior management is placing on it. IT is not simply one time investment but needs continuous updating.

Moreover, senior managers won't promote acquiring new technology because of need of skilled and trained persons for its application in business and the problem with IT staff having less exposure to other parts of the business. Other disadvantages of IT are less social interaction that causes isolation and may affect the team work.

REFERENCES

- [1] A report from the Economist Intelligence Unit sponsored by Caggemini, Cisco Systems and SAP (2006), "Great expectations The changing role of IT in the business", © The Economist Intelligence Unit 2006, pp.3 and 6.
- [2] Ankit Dhamija, (2010), "IT in Business, SCM and CRM", proceeding of National Conference on Modern Trends in Computer Science & Information Technology, 2010, pp.13–15.
- [3] King William, "Role of Information Technology in Growth of Business", <http://ezinearticles.com/?Role-of-Information-Technology-in-Growth-of-Business&id=344198>. Accessed on 02.03.2011
- [4] McAfee, Andrew, and Erik Brynjolfsson.(2007), "Dog Eat Dog." Wall Street Journal. <http://www.computerweekly.com/Articles/2007/10/05/227250/Cutter-paper-IT39s-role-in-creating-business-advantage.htm>, Accessed on 03.03.2011
- [5] Knowledge Management-Emerging perspectives, <http://www.systems-thinking.org/kmgmt>.
- [6] Jiawei Han & Micheline Kamber, A book, " Data Mining: Concepts and techniques", Morgan Kaufmann publishers, © 2001 by Academic Press, pp. 5–7.
- [7] Han Jiawei and Kamber Micheline, ppt., 'Introduction to Knowledge discovery in database and Data Mining', ppt. (http://www2.cs.uh.edu/~ceick/ai/kdd_intro.ppt).
- [8] Michael J. Shaw, Chandrasekar Subramaniam, Gek Woo Tan, Michael E. Welge, "Knowledge management and data mining for marketing", Decision Support Systems 31 (2001).127–137, © 2001 Elsevier Science.
- [9] Hussain Fareed, Caro Lucas, M.Asif Ali, "Managing Knowledge Effectively", Journal of Knowledge Management Practice, May 2004.
- [10] Sivan, Y.Y., (2001). "Nine Keys To A Knowledge Infrastructure". Harward University.

Breadth First Search & Genetic Algorithm as an Effective Technique to Solve Crypt Arithmetic Problems

Anu Sharma¹, Nitin Kumar Verma² and K.B. Anand³

¹Dept. of Computer Science & Engineering, COE, TMU, Moradabad

²Dept. of Computer Science & Engineering, COE, TMU, Moradabad

³Dept. of Mechanical Engineering, COE, TMU, Moradabad

Abstract—Crypt arithmetic is a class of constraint satisfaction problems which includes development of mathematical relations assigning digits to letters in order to make meaningful arithmetic operations. A solution to this problem has been proposed using breadth first search & genetic algorithm. The result of the proposed solution are compared with DFS and found to be better in terms of providing complete and optimal solution. The advantages of using breadth first search and genetic algorithm in the solution of crypt arithmetic problem has been well justified.

Keywords: Crypt-arithmetic Problems, Constraint Satisfaction, Chromosomes, Breadth first search.

INTRODUCTION

Crypt arithmetic is a puzzle consisting of an arithmetic problem in which the digits have been replaced by letters of the alphabet. The goal is to decipher the letters (ie. Map them back onto the digits) using the constraints provided by arithmetic and the additional constraint that no two letters can have the same numerical value [1]. This type of problem was popularized during the 1930s in the *Sphinx*, a Belgian journal of recreational mathematics [2]. One of the well known Crypt arithmetic problems which published in the July 1924 issue of Strand Magazine by Henry Dudeney [3] is shown in Fig 1.

```
SEND
+ MORE
-----
MONEY
```

Example 1: Crypt arithmetic problem

Assigning digits to letters in the following way would be an acceptable solution which is arithmetically correct.

O=0, M=1, Y=2, E=5, N=6, D=7, R=8 and S=9.

Hence the result would be as shown in Example 2.

```
9567
+ 1085
-----
10652
```

Example 2: An acceptable solution to problem in Example 1

Constraint satisfaction is a search procedure that operates in a space of constraint sets. The initial state contains the constraints that are originally given in the problem description. A goal state is any state that has been constrained "enough" where "enough" must be defined for each problem. For example, for crypt arithmetic, enough means that each letter has been assigned a unique numeric value. Constraint Satisfaction Problems (CSP) has been a subject of research in Artificial Intelligence for many years. [1]. Many powerful algorithms were designed that became a basis of current constraint satisfaction algorithms. Crypt-arithmetic problems fall under the category of Constraint Satisfaction Problems. A standard problem consists of a series of variables and sets of possible assignments to these variables, along with a set of constraints that relate to the allowable assignments among the variables. For example, a crossword puzzle challenges us to fill in blank spaces with words. Crossword puzzles can be seen as Constraint Satisfaction Problems by treating sets of blank spaces as variables, and the word choices as domain values. Choosing the right order of variables and values can noticeably improve the efficiency of constraint satisfaction. Genetic Algorithms not only provide an alternative method to solve CSPs, it also consistently outperforms other traditional methods. Its usefulness and gracefulness of solving problems has made it a better choice among the traditional methods, namely gradient search, random search and others.

This was first introduced by H.E. Dudeney and was first published in the July 1924 issue of Strand Magazine associated with the story of a Kidnapper's ransom demand [2].

The paper is organized as follows: section 2 recalls how a Constraint Satisfaction Problems may be defined along with its standard form; a brief overview of the crypt-arithmetic problems along with their conventions and constraints are discussed; the last section shows the experimental results for a typical crypt-arithmetic problem. genetics and natural selection.

These algorithms are powerful search techniques that are used to solve difficult problems in many disciplines. Unfortunately, they can be very demanding in terms of computation load and memory. Parallel Genetic Algorithms (PGAs) are parallel implementations of GAs which can provide considerable gains in terms of performance and scalability. The most important advantage of PGAs is that in many cases they provide better performance than single population-based algorithms [3]

CONSTRAINT SATISFACTION PROBLEMS

A constraint satisfaction problem is a special kind of search problem in which states are defined by the values of a set of variables and the goal test specifies a set of constraints that the value must obey. Constraint may be higher order, Unary or binary. Unary constraint concerns the value of a single variable, binary constraints relate pairs of variables while higher order constraints are between all variable in a row. Crypt-arithmetic column constraints fall under Higher-order Constraint category of problems. Each constraint restricts the combination of values that a set of variables may take simultaneously. A standard search Problem can be formulated with the help of 5-tuple (States, Initial state, Successor function, Goal test, Path Cost) where,

- States is a set of value assignments to some or all of the variables
- Initial State is an empty assignment
- Successor function is used for value assignment to any unassigned variable without conflicting with previously assigned variables
- Goal test is used to find out whether the current assignment is complete and
- Path Cost, which denotes a constant cost

CRYPT-ARITHMETIC PROBLEMS

Crypt arithmetic is the science and art of creating and solving Crypt arithmetic problem. It is a type of mathematical puzzle in which the digits are replaced by alphabets or other symbols. The invention of Crypt arithmetic has been dated back to ancient China. This art was originally known as letter arithmetic or verbal arithmetic. In India, during the middle ages, Crypt arithmetic called "skeletons" were developed. These were Crypt arithmetic in which most or all of the digits have been replaced by asterisks.

CRYPT-ARITHMETIC CONVENTIONS

The following crypt-arithmetic conventions are to be considered for solving the problem in hand:

- Each letter or symbol represents only one digit throughout the problem
- When letters are replaced by their digits, the resultant arithmetical operation must be correct
- The numerical base, unless specifically stated, is 10; and
- Numbers must not begin with a zero

Example.1 shows sample Crypt-arithmetic problems and their corresponding solutions satisfying the above conventions

DONALD + GERALD = ROBERT, which has one solution, given by A = 4, B = 3, D = 5, E = 9,

G = 1, L = 8, N = 6, O = 2, R = 7, T = 0. In general, if there are n letters then there are 10^n possible states. However, the requirement of a unique digit for each letter means that there are $\frac{10!}{n!}$ ways to choose the values and $n!$ ways to assign them to the letters, which reduces the total number of search states to

$n! \cdot \frac{10!}{n!} = 10! = (10 \cdot n)!$. Thus the above example, which has 10 letters has $10!$ states in its search space.[4]

CRYPT-ARITHMETIC CONSTRAINTS

To solve the problems as shown in Example1, we have considered around 33 constrains. For e.g., in SEND + MORE = MONEY problem, we have total 8 variables to which the values are to be assigned. Out of these, 7 distinct variables are in operands while 1 unrepeatd variable is in resultant. Depending upon the occurrence of the variables, the values which are assigned to variables should also be repeated. In general, the value of the extra variable in the resultant can be 0 or 1 only, not more than that. But from the discussed above, it can be pointed out that the value of variable M cannot be 0 because if it is so, the values of the variables S and O would have same value, which itself violets the constraint that every variable should be assigned a unique value.[1]

STRATEGIES FOR SOLVING CRYPT ARITHMETIC PROBLEMS

Breadth First Search

Breadth-first search generates new states in the order of their distance from the start state. All states at level i are examined before any states at level $i+1$ are examined.

Algorithm

1. Put the start node s on a queue called open. open contains nodes that are still to be examined.
2. While open is non-empty,

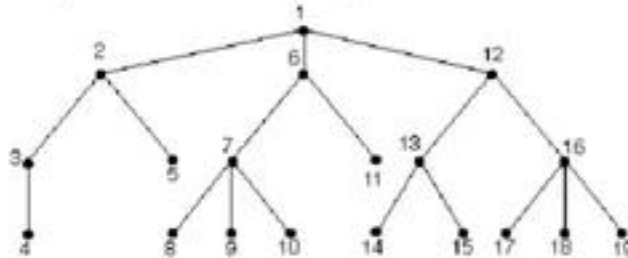
- Remove the first node n from open; put n on a list called closed. If n is a goal node, terminate with success. The solution path is given by the pointers from n back to the start node.
- Expand node n (generate its successors). For each successor node m , if it is neither on open nor on closed, put a pointer from m back to n and record the operator used; insert m at the end of the open queue.
- Open is empty; terminate with failure.

Advantages

1. Guaranteed to find an optimal solution (in terms of shortest number of steps to reach the goal).
2. Can always find a goal node if one exists (complete).

Disadvantages

1. High storage requirement: Exponential with tree depth. [8]



All numbers in Fig 1 refer to order visited in search.

Here we have an addition sum where letters denote distinct digits. We assume we do not want solutions with leading zero digits (so $R \neq 0$ and $D \neq 0$).

```

ROE
+ RED
-----
DEER
-----

```

The goal is to find the possible solutions to the problem. We are not so much interested in showing how to get there although we do wish to know that all solutions have been obtained

```

E+D=R E+D=R+10
O+E=E O+E=E+10 O+E+1=E O+E=E+9
X X
R+R=E R+R=E+10 R+R+1=E R+R=E+9
X X
D=1 D=1
2R=E+10
E+1=R
O=0
2R=E+9
E=R+9
O=9
X
E=8;R=9;D=1;O=0

```

Once a tree or graph has been constructed for solving a problem, we require techniques for searching the structure. There are essentially such algorithms.

1. Depth first: Go down the leftmost branch until a leaf is reached. If not a goal then back up branch until find a branching node and go down leftmost branch not yet visited.
2. Breadth first: Scan level 1 for goal first in a left to right manner. If no goal found then scan level 2 and continue in this manner.

Depth first search may not be complete (find a goal) if there are possibly infinite branches. The search may get stuck continuing down an infinite path and so not find a goal which is on another branch.

Breadth first search is guaranteed to find a goal if one exists and is optimal in the sense that a goal with minimal depth in the tree will be obtained.[6]

GENETIC ALGORITHM

Genetic Algorithms (GAs) are search algorithms inspired by genetics and natural selection [4]. These algorithms are powerful search techniques that are used to solve difficult problems in many disciplines. Unfortunately, they can be very demanding in terms of computation load and memory. Parallel Genetic Algorithms (PGAs) are parallel implementations of GAs which can provide considerable gains in terms of performance and scalability. The most important advantage of PGAs is that in many cases they provide better performance than single population-based algorithms, even when the parallelism is simulated on conventional machines [3]. Genetic algorithms are typically implemented as a computer simulation in which a population of chromosomes of candidate solutions to an optimization problem evolves towards a better solution. To formulate the solution to above problem[1]

Genetic algorithms are basically a smart search procedure. The goal is to find a solution in a multi-dimensional space where there is no known exact algorithm. Genetic algorithms are often thousands or even millions of times faster than exhaustive search procedures. Exhaustive search is impractical for high dimension problems. The use of random mutations allows genetic algorithms to avoid being trapped in locally-optimal regions which is a serious problem for hill-climbing algorithms typically used for iterative/convergence procedures.[7]

Biological DNA systems, the basic units are the adenine (A), thymine (T), guanine (G) and cytosine (C) nucleotides that join the helical strands. In genetic algorithms, the basic unit is called a symbol. The nature of symbols depends on the particular genetic algorithm. In gene expression programming, the symbols consist of functions, variables and constants. Symbols for variables and constants are called terminals, because they have no arguments.

An ordered set of symbols form a gene, and an ordered set of genes form a chromosome. In GEP programs, genes typically have 4 to 20 symbols, and chromosomes are typically built from 2 to 10 genes; chromosomes may consist of only a single gene. The DNA strand for a mammal typically contains about 5×10^9 nucleotides.

Structure of Chromosome

The chromosomes are traditionally represented in terms of binary strings of 0s and 1s, but other encoding schemes are also possible. Here, we have used decimal numbers (e.g. 1,2,3...) to represent the chromosomes. The process starts from randomly generated individuals and are replaced by better chromosomes generation by generation. A chromosome here looks like

3	6	1	0	8	5	4	9
---	---	---	---	---	---	---	---

A Chromosome for Crypt- arithmetic Problems

For e.g.

SEND+MORE=MONEY problem the size of chromosome is taken as 7. The additional distinct variable in the resultant (i.e. Y) is considered as a constraint at the time of assignment of values to the variables. [1]

Comparison between DFS v/s BFS

Table 1

	Complete	Optimal	Time	Space
BFS	YES	YES	$O(bd+1)$	$O(bd+1)$
DFS	Finite Depth	NO	$O(bm)$	$O(bm)$

m is maximum search depth d is solution depth b is branching factor

Time

$m = d$: DFS typically wins

$m > d$: BFS might win

m is infinite: BFS probably will do better

Space

DFS almost always beats BFS

RESULTS & CONCLUSION

This paper concentrated on Crypt-arithmetic problem solved by Breadth first search & Genetic algorithm. We can find that BFS Guaranteed to find an optimal solution and it can always find a goal node if one exists. BFS is optimal in comparison to DFS. This technique not only help to find a good solution but also given the exhaustive nature of the problem.

From the Desk of Conference Convener

Proud to be an Indian!

A Brief Introduction to the Conference Theme

When our future generation will read India's history, a few prominent turnarounds shall be prominently taught. The golden era of India's history during which India flourished and was adoringly called 'the golden bird; then came the plunderers with ulterior motives and then we got independence. Post independence it was realized, we were still not independent- gone was the British Raj but license raj, quota raj, permit raj let loose a reign of economic slavery. And finally, in 1991 as per the demand of the hour our economy was also liberated.

These days it is commonplace to hear people talk about how India is emerging as a great economic superpower and how, together with another robust Asian economy- China, it is reshaping the world economic system. There is a sequence of events that brought India to this juncture- emerging forces of demographic change, urbanization, growing middle class, rising literacy levels, entrepreneurship, economic reforms, and growth of IT. The conference has been organized to confer upon such issues in the light of India's present and its future.

India's performance in primary school enrollment is regarded as one of its great achievements, and its near 100% net enrollment is one of the Millennium Development Goal targets it has reached ahead of time. But this milestone hides some shocking facts- just half the kids who enroll in Class I actually make it to Class VIII.

We brag to be the next fast upcoming superpower. 230 million Indians go hungry daily. (Source: International Food Policy Research Institute). According to this survey carried out early this year, India is 67th among the worst 80 countries in terms of malnutrition.

Another fact which puts us as nation to embarrassment is that 13 lakh children die before first birthday. The maternal mortality rate in Western Europe is 15, Russia and Brazil is below 133, China is 38 while it works out to 212 in India. We top the chart again.

No doubt the nation has got immense potential as it is a country so young that 50 percent of the population is still not eligible to vote. This is country's strength. We have to channelize this potential in the right direction and utilize it to the optimum.

I want to be a citizen of a nation where multi billion scams are not a common place, where a chief minister is not permitted to send a personal jet to get a pair of sandals, where juxtapose Antilia slums are not seen, where there is no opulence versus penury, where democracy is not only a word included in the Constitution, but practiced, where I can hold my head high and say I'm citizen of a progressive nation in the true sense of term.

The conference on "Resurging India—Myths and Realities" intends to bring forth issues that largely deal with the renaissance of India-its resurgence!

In short this conference is the opera of a bird which has risen, fallen and again risen from the ashes-the phoenix called India.

Vaishali Dhingra

Faculty Incharge, CMCA,

Teerthanker Mahaveer University, Moradabad

REFERENCES

- [1] Hardik Soni, Nidhi Arora, Solving crypt-arithmetic problems via genetic algorithm *J*academy of IT & Management.
- [2] Abu Sayef Md. Ishaque, Md. Bahlul Haider, Muhammad Al Mahmud Wasid, Shah Mohammed Alaul, Md. Kamrul Hassan, Tanveer Ahsan, Mohammed Shamsul Alam, An Evolutionary Algorithm to Solve Cryptarithmic Problem, *Transactions on Engineering, Computing and Technology* v1 December 2004 ISSN 1305-5313.
- [3] Reza Abbasian, Masoud Mazloom, Solving Cryptarithmic Problems Using Parallel Genetic Algorithm, 2009 Second International Conference on Computer and Electrical Engineering.
- [4] Tad Hogg, Bernardo A. Huberman, Better Than The Best: The Power of Cooperation, 1992 *Lectures in Complex Systems*, pp. 165-184, Addison-Wesley 1993.
- [5] <<http://physicsarchives.com/index.php/courses/241>>.
- [6] <<http://cs-sol.swan.ac.uk/~cs488884/Logic%20and%20AI/chapt3.pdf>>.
- [7] <http://www.dreg.com/gep.htm?gclid=CKzu_Kba260CFUkb6wodLSzc0g>.
- [8] Prof.S.P.Shinde1, Prof.V.P.Deshmakh2 & Prof S.S.Kapase3, An Overview of Artificial Intelligence with.
- [9] Game Playing and Search Techniques, *International Journal of Research and Reviews in Computer Science (IJRRCS)* Vol. 2, No. 3, June 2011.

Project Management Methodology Used for Process Improvement in IT

Nilesh Mahajan¹, Kirti Mahajan², Tusshar Mahajan³ and Sonia Gupta⁴

¹Associate Professor, Imed, Bharti Vidyapeeth University, Pune

²Associate Professor, Imed, Bharti Vidyapeeth University, Pune

³Associate Professor, CMCA, TMU

⁴Sr. Lecturer, CMCA, TMU

Abstract—Projects are the way organizations improve performance. Projects result in new and improved products and services and improve processes by increasing effectiveness, lowering costs and increasing quality. Project Management (PM) is a critical factor in making sure that projects are performed well to achieve their objectives. PM methodology improves PM performance. A methodology is a defined process. It may be called guidelines or a framework. It is written set of policies and procedures, supported by tools, role and responsibility definitions, checklists and templates. Implementing a PM methodology should promote lean and agile performance. In this paper we discussed Agile and Traditional methods.

Keywords: Project Management, Agile Method, Traditional Method.

INTRODUCTION

Project Management (PM) methodology is a critical factor; it alone does not improve project performance. Now organizations are working on new methods called Agile Methods. Agile methods are evolved to adopt changes quickly during the development. This approach is just opposite to plan driven traditional approaches. The main focus of Agile method is early releases of working software that responds to changes promptly using collaborative techniques, code refactoring, test driven development and customer involvement.(figure 1)

PRINCIPLE OF AGILE METHODS

1. Highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes change for the customers' competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter time scale.
4. The most efficient and effective method of conveying information to and within a development team is face to face conversation.
5. Agile processes promote sustainable development. The sponsors, developers and users should be able to maintain a constant pace indefinitely.

We will discuss Agile methods and compare it with other traditional development.

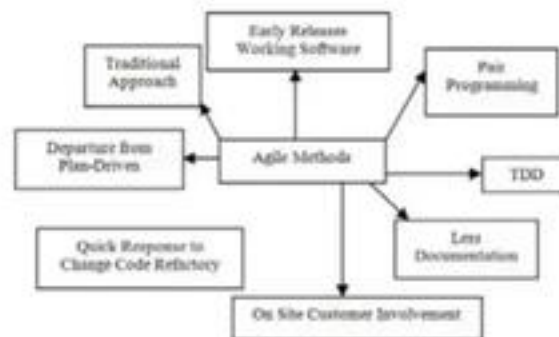


Fig. 1

Table 1

Defined Process	Waterfall Required	Spiral Required	Iterative Required	Agile Planning and Closure Only
Final product	Determined during planning	Determined during planning	Set during project	Set during project
Project cost	Determined during planning	Partially variable	Set during project	Set during project
Project completion date	Determined during planning	Partially variable	Set during project	Set during project
Responsiveness to Environment	Planning Only	Planning primarily	At end of each iteration	Through-out
Team flexibility creative	Limited look book approach	Limited look book approach	Limited Lookbook approach	Unlimited during operation
Knowledge transfer	Training prior to project	Training prior to project	Training prior to project	Team work during project
Probability of success	Low	Medium low	Medium	High

Most common problems organizations face during and after software/ project development are:

Frequent Changes from Client Side

In few cases we receive frequent small changes from client and in this scenario it's almost impossible to apply defined classical processes. So we start implementing new changes after delivery on ad hoc basis.

Depending on Resource

Since different team is responsible for different phase of development, there are more dependencies on respective resource.

Documentation Takes Lot of Time

We find documentation consumes lot of time. It's very hard to create and update for short duration project or project with short deadlines.

Impact Analysis is Very Complex

We always emphasize to create document that must cover all the important info and fact. But after putting all there relevant fact and figures it becomes very large document.

COMPARISON WITH OTHER EXISTING METHOD

Limitations of Agile Method

1. Limited support for distributed environments.
2. Limited support for building reusable artifacts.
3. Limited support for developing safety critical software.
4. Limited support for development involving large team.

Best Practices of Agile Process

1. Unit testing and Test-Driven development ensure that bugs and errors are found quickly and early so that it would be cheaper to fix.
2. On-Site customer and functional testing ensure the analysis and specification of the system is upto date and precise with business requirements.
3. Pair programming allows two developers working together on one computer, which increases the chances of finding bugs and leads to a simple design.
4. Daily small status meeting ensure the progress is in right track.
5. Use of UML diagrams help to address long documentation and cumbersome impact analysis of design change.

Challenges in Adopting Agile Methods

Following are the main challenges:

1. Fear to change
2. Specialized skills
3. Outdated skills
4. Documentation heavy mind set
5. Do it all at once attitude
6. Serial thinking
7. Closed mindedness
8. Office politics
9. Black and white mindset.

CONCLUSION

Agile methods emphasize or focus to respond the changes quickly even late in development and feel complete satisfaction after the delivery of any project. In agile methods, the software grows through each iteration and each iteration adds some business value to the final product. But heavy methods try to acquire most of the requirements early and then build and test the application on those specifications.

FUTURE SCOPE

We will investigate which method is to be implemented in IT industry to improve success project rate and also find which factor most affect to failure rate of projects in IT.

REFERENCES

- [1] Khan, A (to be published in 2009) Survey of development methodologies for the web. Minor research thesis departments of inform systems university of Melbourne.
- [2] K.B. Hass "The blending of traditional and Agile project management", project management world today, vol. ix issue, no 7.
- [3] Belass; W; and Tukul, O.I. (1996). A new framework for determining critical success/failure factors in projects, international Journal of Project mgt.
- [4] Basili V.R. and Weiss, D.M. (1984). A methodology for collecting valid software engineering data IEEE transactions on software engineering 10(6), 728-738.
- [5] Pinto, J.K. and Levin, D.P.(1987). Critical success factors in successful project implementation IEEE transactions engineering management, 34(1) 22-27.

Interior Decoration through Creative use of Custom CAD Softwares

Bhawana Goel¹, Ramji Maurya² and Kavita Bisht³

^{1,2}Directorate of Extension Education, SAMETI-Uttarakhand

³G.B.P.U. Ag. & Tech., Pantnagar, Uttarakhand

Abstract—Interior decorating generally covers enhancing the visual presentation of the interior of a building, home, or other structure. When decorating a home, there are many things to think about. Space planning, flooring, lighting, furniture, window treatments and the accessories. Among them accessories like wall panels, pictures, photo frame etc plays an important role for decorating the home. A small picture will look better hanging in a small space, or in a group with other small pictures. They should be spaced close enough together so that the eye takes them in as a group. It is best to arrange them so that they form an approximately rectangular shape. In this way lots of ideas comes in our mind in planning the interiors with wall panel/pictures/photo, but it is not possible to see the effect of all pictures by using it actually.

Hence it is important to use some method for interior decoration which can help and save time, money, energy of the designer/customers. In this direction computer aided designing is a solution to this problem. It can help the customer as well as interior decorator to plan and see the final look of the home with accessories prior to the construction of pictures.

In the present study attempt has been made to design the wall panels, pictures/photos its framing etc. with the help of a computer-based tools and simple/custom software's. The interiors decoration is done with these accessories with the help of CAD using simple software like Microsoft office, Microsoft power point, adobe photoshop etc. Computer aide designing technique was find helpful in saving time, money, energy with the result of increase satisfaction of customers and designers prior to its actual construction.

Keywords: Computer Aided Designing (CAD), Wall Panels, Interior Decoration, Software

INTRODUCTION

In the present global market designers are facing a stiff competition from those who have the latest technology in creating the good designs in less time, money and effort with greater accuracy. Conventional way of designing is very skill oriented, time consuming and thus costly. A design first had to be visualized and then the arduous process of representation would take place. The hand produced sample swatch would be time-consuming and therefore expensive. If any changes were necessary, even minute changes, a whole new design would have to be rendered. Designers have difficulty in keeping pace with the fast changing trends of the market. Designers are facing the challenges of constantly changing fashion, shorter runs, more colors per design and ever growing variety of designs therefore it is very difficult to remain in competitive market with conventional system of designs. Today's design becomes out of fashion tomorrow, hence they loose a share of market.

So, to keep pace with fast changing trends of designs and according to the pulse of present market it is very important to include the fast, money, energy and time saving techniques like computer aided interior decoration (CAD). Computer is becoming an ever increasing demand of today fashion word; the use of computer may have remarkable opportunities for innovative designs, improved productivity, and greater efficiency in the use of materials. Computer-aided design (CAD)—the term sounds intimidating. Many people still think it would take them longer to create designs on CAD software than by hand. With the easy-to-use tools and the accuracy of CAD, design is faster and better than ever. The move to computerization is a major trend in the designing industry today. Computers are changing the way designers all over the world are working. For designers of any field i.e. interior decoration, textile designing, CAD has become more or less indispensable. With the help of softwares designer can sketch, visualize and produce attractive, saleable hardcopy of his or her ideas in full colour with their application in decorating the room/home. The swatches produced are extremely realistic and technically accurate. Designers can save swatches on zip disks, CD-ROM or in the hard drive. The swatches can then be easily edited.

The main advantage of using CAD software for interior decoration is that the designer can visualized their design prior to its actual construction. They can see the final look of their designs and home on computer screen itself and can make any change in this according to their choice. Colour combinations of designs, their placement and any desired modifications can be made on computer screen with the click of mouse itself. In this way designer can save time, money energy along with getting the ultimate customer satisfaction. We can create endless number of designs. Over and over we have heard the phrase, "the computer is just another tool." Computers simply aid in the process; they serve as tools for designers and so on, but they cannot replace the skills required to generate a first design. Computers will never be assumed to have the color sense or the eye for proportion and detail that a designer feels intuitively. They will never be able to weed out the good designs from the bad ones. CAD is a tool, like a paintbrush, pencil, hip curve, or calculator. It is no wonder that even small-scale design and manufacturing companies are using CAD systems. A typical CAD system consists of two parts Hardware and software. Hardware part consists of PC compatible Pentium processor with color

monitor, digitizer, scanner, printer and plotter. The software programme can create the design and motif, process it, manipulate it, display it on the monitor and finally give output of the design and production data in a suitable format. The CAD system increases utilization of both human and manufacturing resources and benefits of quick response to market requirements and demands. The pattern is less likely to have faults and there is less chance of error in the pattern formation. If there are any errors, correction is quick and easy. This improves the quality and quantity of time spent.

Thus in view of the above stated significance of the computer aided designing (CAD), this paper present a focus on the practical use of the simple software's. There are many software's which can be used for interior decoration but most of them are very costly therefore they are not with in the reach of people. In the present study attempt has been made to design the wall panels, pictures/photos its framing etc. with the help of a computer-based tools and simple/custom software's. The interiors decoration is done with these accessories with the help of CAD using simple software like Microsoft office, Microsoft power point, adobe photoshop etc. Detailed stepwise procedures of making designs and interior decoration done with theses design are given as here under.

Adobe Photoshop is an image processing software package that enables to create & edit images on computers. It has been used to edit and create Images as diverse as designs, new Photos, Motion picture footage, Animation cells & fine art work, Creates original art & converts it to desire platforms, retouch, Manipulate & enhance photographs of designs, Master the Special effects you've always wanted.

PATTERN 1: FOR CREATING ANY FREE HAND DRAWING DESIGN

Steps

1. Go to file MENU and click NEW or press CTRL + N.
2. For making an design select PEN tool from the toolbox.
3. Click anywhere on the file screen then make the design with the help of left mouse button. Always remember to close the design by clicking on the starting point so that you can fill the colour.
4. Now select the paint bucket tool from the left toolbar.
5. Select any colour from the color picker and click ok.
6. Fill pattern in the created image by clicking on to the image, texture or pattern.
7. Now select free hand, pen tool for forming the design with the help of left mouse button.
8. Again pick the colour from the color pick and click ok.
9. If you want to change a pattern which is created, then select shape tool from the tool box to change shape of the curve.
10. Using pick tool, select whole design and click group.
11. Arrange the design as required on the drawing page using guidelines.

Pattern 2: To Create Repeat Pattern Design

Steps

1. Go to file MENU and click new or press CTRL + N.
2. Set the width and height in inches.
3. Select the move square and fill with colour.
4. Select the circle and fill in the colour.
5. Convert drawing into bitmap image by going into bitmap menu.
6. In bitmap menu, go to distort and select swirl.
7. Select clockwise or anticlockwise swirl as well as number wholeness of rotation and click ok.
8. In a bitmap menu, go to DISTORT option in this select TILE option.
9. Fill number of repeat units required vertically and horizontally and PER CENT of overlap required. Click OK
10. Select the image and enlarge it by dragging.

Pattern 3: Design Arrangement in Different Way

Steps

1. Go to file MENU and click new or press CTRL + N.
2. Set the width, height in inches.
3. Open the pre-existing design file.
4. Press CTRL + A for selection, CTRL + C for copy and then paste it by pressing CTRL + V.
5. Go to the property bar, use mirror buttons to set the design in both the direction i.e. lower and upper.
6. Select whole image and group it by right mouse click.
7. To change the dimensions of the image, click object size and set size in inches then click.
8. Draw the pattern using single repeat.

Pattern 4: To Create Repeat Pattern Design using Type Tool**Steps**

1. Go to file menu and click new or press ctrl + N.
2. Set the width, height in inches and resolution as 72 pixel/inch, and then click ok.
3. Select the move tool and drag an imaginary line from the ruler by pressing the left mouse.
4. Click Type tool option on the left toolbar.
5. Click on the file screen and write any letter.
6. Select the letter by clicking it.
7. You can also change the font, size, color and style of the letter.
8. Click the warp text tool on the top toolbar.
9. Choose your own style from the warp text dialogue box.
10. You can modify the style according to your wish by changing the bend percentage, horizontal distortion and vertical distortion, then click ok.
11. Click on to the screen for deselecting the letter.
12. Press ctrl + A for selection, ctrl + C for copy and then paste it by pressing ctrl + V.
13. Go to the edit menu, click transform and select flip horizontal, then set the image by move tool.
14. Press ctrl + V, then repeat the above step and select flip vertical.
15. Again press ctrl + V and repeat step 13 and 14.
16. Remove the imaginary line by dragging the line towards the ruler and towards the blank screen.
17. Select crop tool from the left toolbar.
18. Crop the image according to your own requirement then click on any option on the left toolbar.
19. One dialogue box will appear on to the screen regarding crop the image, then click crop.
20. Go to image menu, click image size and set document size in inches then click ok.
21. Go to edit menu, select define pattern and name your pattern, then click ok.
22. Open a new file or press ctrl + N.
23. Again set the height, width in inches and resolution as 72 pixel/inch, and then click ok.
24. Go to edit menu and select fill option.
25. One dialogue box will appear on to the screen, choose your own pattern from the custom pattern, and then click ok.
26. Now you can see your own design.

Pattern 5: Step Repeat**Steps**

1. Open a new file from file option.
2. Set the rulers & imaginary lines for help.
3. Import any picture from pre-existing file, insert a scanned picture by using file option from picture or create a new design using pencil, lasso tools or brush tools etc.
4. Define the size of the picture say 1 X 1 inches.
5. Copy the picture using, Ctrl +A then Ctrl +C.
6. Paste it on new file using Ctrl + V.
7. Set in first box of the first row.
8. Again paste the same image and set it in second box of the same row by dropping its one-fourth.
9. Do the same procedure with the third and fourth box.
10. Then merge the above four layers & copy it.
11. Paste it from the fifth box the first row.
12. Repeat the procedure until the row gets full.
13. Merge the above layers, copy it and paste in the second row.
14. Repeat the procedure until the rows get full.
15. Now crop the layers for repeat work.
16. Save your work at last.

Pattern 6: Designing with Different Type of Brushes**Steps**

1. Open a new file.
2. Fill the background color according to your wish.
3. Now open a new layer for another work in the same file.
4. First set the rulers and imaginary lines for help.

5. Select the brush tool and select a particular style of brush provided with it.
6. After selecting a particular brush, select the color in which you want a image.
7. Click on particular place where you want on your canvas.
8. Repeat the same procedure until your canvas gets full
9. For the use of next brush, first open a new layer and repeat the above procedure for the same.
10. At last crop the canvas for repeat work.
11. Save your work.

Pattern 8: All-Over Design Pattern

Steps

1. Go to the file menu and click new or press ctrl + N.
2. Set the image size in inches and click ok.
3. If ruler is not there then for seeing the ruler go to view option and click show ruler or press ctrl + R.
4. Click on create new layer option from the bottom of the right side toolbar.
5. Then click the Single column Marquee Tool from the left toolbar.
6. Click on to the file screen for the formation of column.
7. Go to the edit menu and click stroke option.
8. Set the width, location, color, blending and opacity according to your own wish, then click ok.
9. Press ctrl + D for deselecting the line.
10. Press ctrl + A and then press ctrl + C for copying it.
11. Again go to create new layer option on the bottom of the right side toolbar.
12. Paste the copied layer into the new layer by pressing ctrl + V.
13. Set the line on to the screen horizontally by using the Rotate 90° CW tool from transform option in edit.
14. Repeat the same procedure according to your column and row requirement.
15. Merge the above layers, copy it and paste it.
16. Now rotate the whole design by using rotate 180° tool from transform option in edit for completing a box design.
17. Fill the inner of this box by selecting special effect brush from the brush tool.
18. Go to image menu, click image size and set document size in inches then click ok.

Pattern 9

1. To see the effect or placement of any designs in your own drawing room or anywhere in home, first take the photo and make jpg picture of that.
2. Now apply the jpg image of the designs/accessories/wall panel on the desired place in your home.
3. We can see the final look of our wall panel and any desired modification could be made at this time by rearranging this picture.

Any handmade article can be seen as wall panel by CAD. Different frame design can be made by adobe Photoshop or readymade frames can be use. Customer can see the effect of their design as it will look after framing (as shown below).



Fig. 1



Fig. 2

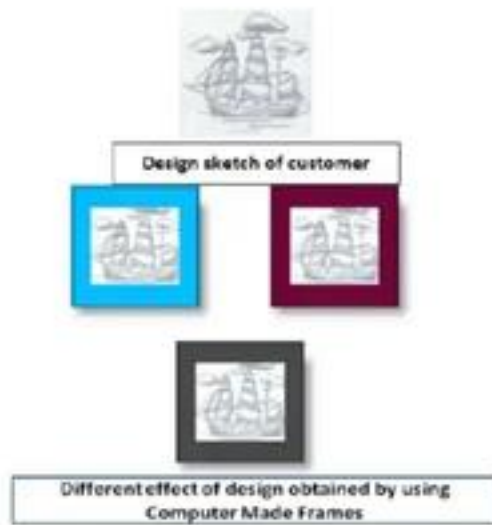


Fig. 3



Fig. 5



Fig. 4



Fig. 6

CONCLUSION

It is now very clear from the above discussion that creative and practical use of simple, easily available, cost effective and user-friendly software can be best utilized for interior decoration. The endless number of designs can be created. Computer aided interior designing/decorations through all these simple software's can easily be taught to the youth and will definitely help them in creating unique designs in less time. Computer aide designing technique was find helpful in saving time, money, energy along with the satisfaction of customers because in this, designers can show the work to customer prior to actual construction of the products and any modification could be done. With a little effort and creative use of simple computer software's youth can start their own work and can get the employment as interior decorator. This work can be performed online by sending mail to the client (or by video presentations) which will be helpful in getting feedback from them. A common facility centre-(CFC) can be established at nominal charges and people can be trained. This will also reduce the migration of youth from their places and congestion in metropolitan cities.

SESSION II



An Analysis of Delhi Local Transportation with Special Reference to Delhi Metro

Gurendra Nath Bhardwaj¹ and Babita Pandey²

¹Associate Professor, NIIT University, Neemrana, Rajasthan

²Lecturer, Kali Charan P.G. College, Lucknow

Abstract—The Delhi Metro is a part of an Integrated Multi Mode Mass Rapid Transport System (MRTS) which has been planned for dealing with the fast growing passenger traffic demand in Delhi. It has become an alternate convenient and comfortable mode of travel in Delhi which caters to a large fraction of passengers using the road transport in Delhi. This research shows the economic analysis of Delhi Local Transportation with special reference to Delhi Metro. It is being analyzed through descriptive research by way of structured questionnaire. The study has been made to understand the preferences of Delhiites for traveling in Metros over other means of transportation. Further it measures the impact of Delhi Metro on the social and economic aspect of Delhi people. This research helps in analyzing the transforming effect of Delhi's overall picture with the introduction of Delhi Metro. The analysis shows that the introduction of Metro services in Delhi has changed people's preferences regarding mode of local transportation. The users find the metro services suitable because it is more convenient and time saving. Further, in order to avoid the stress of driving, people use metro services.

Keywords: Integrated Multi Mode Mass Rapid Transport System, Means of Transportation

INTRODUCTION

The local transportation is the lifeline of Delhi. Delhi's population stands at 13,782,976 spread over 1,483 square km. More than half of the population in Delhi is dependent on local transport for commuting purposes. The city has a developed public transport system, which is undergoing rapid modernization and expansion. There are more than 5.5 million registered vehicles in the city, which is the highest among all cities of India. The need for a reliable public transportation system had been felt for a long time. This adds significantly to city's traffic and pollution woes. Therefore serious efforts, including a number of transport infrastructure projects, under way to encourage usage of public transport in the city. Because of relatively large development of road infrastructure, public transport in the metropolis is largely road-based and includes a bus system, auto-rickshaws, cycle-rickshaws and taxis.

With the introduction of Delhi Metro, a rail-based mass rapid transit system has gained ground. Other means of transit include suburban railways, inter-state bus services and private taxis which can be rented for various purposes. However, buses continue to be the most popular means of transportation for intra-city travel, as they cater to about 60% of the total commuting requirements. Private vehicles account for 30% of the total demand for transportation, while the rest of the demand is met largely by auto-rickshaws, taxis, rapid transit system and railways. The project is being implemented through a joint venture company (viz., Delhi Metro Rail Corporation Ltd.) set up on 50:50 partnership ratios by GOI and GNCTD in May, 1995 and will be completed within 10 years.

REVIEW OF LITERATURE

Social Cost-Benefit Analysis of Delhi Metro

The Delhi Metro provides multiple and incremental benefits and costs to a number of economic agents: government, private transporters, passengers, general public and unskilled labor. The social cost-benefit analysis of Delhi Metro tries to measure all these benefits and costs from Phase I and Phase II projects covering a total distance of 108 kms in Delhi. Estimates of the social benefits and costs of the project are obtained using the recently estimated shadow prices of investment, foreign exchange and unskilled labor as well as the social time preference rate for the Indian economy for a study commissioned by the Planning Commission, Government of India and done at the Institute of Economic Growth. The financial internal rate of return on investments in the Metro is estimated as 17 percent while the economic rate of return is 24 percent. Accounting for benefits from the reduction of urban air pollution due to the Metro has increased the economic rate of return by 1.4 percent.

Survey of Delhi Metro using Equipments Developed in UK

The study used vibration levels experienced by passengers in the metro as a measure of the comfort level and compared it with international standard ISO 2631-4-1997. According to the study, the vibration inside the train was less than 0.315 meters per second squared (m/s^2), which is the most comfortable level according to ISO standards. It used a device called potentiometer, developed jointly by Loughborough University, UK, and IIT, Delhi, for the first time in India. The data regarding vibration and human responses were than recorded by a central computer and the real ride comfort was assessed. The study was conducted on elevated and underground sections of all three operational lines of the Delhi metro and results from all sections were within the most comfortable category.

A Comparative Study of Executive and Non Executive Associates of DMRC for their Level of Commitment and Personal Efficiency

The research was designed to study the level of commitment and personal efficacy amongst the associates of *Delhi Metro Rail Corporation (DMRC)* and also to understand the relationship between these two variables. Data was collected from 50 executives and 50 non-executives of DMRC. For this purpose, Organizational Commitment Instrument (OCI) and Personal Efficacy Test were administered individually to all employees. Chi-Square was applied to see the level of commitment and personal efficacy of executives and non-executives. The results were analyzed using Chi-square test Pearson Product Moment correlation. The results revealed that Chi-square for commitment was 35.78, which was significant at 0.01 levels. There was only one employee from non-executive group who showed high level of commitment. There were only 5 non executive employees who showed high personal efficacy. The correlation coefficient of commitment with personal efficacy (n=100) came out to be 0.324 significant at 0.001 levels.

Message in a Metro-Building Urban Rail Infrastructure and Image in Delhi, India

The development of a *metro* railway in *Delhi* shows that galvanizing public support and attracting patrons to a public transit system stems from creating an all-round positive image that combines tangible variables with an intangible set of symbolic meanings. Of course, image is only an impression, and does not necessarily reflect reality. The article examines the broad physical and societal implications of the *metro* development in *Delhi*, and uncovers the driving forces behind the project. In spite of the cultivation of a positive image, the specific *metro* form that was developed in *Delhi* to satisfy each of the special interest groups involved in its production might be specifically one that fails to suit the *transportation* needs of the city.

Mass Urban Transportation in India-Features of Three Models and Learning

Urbanization and urban population growth have now firmly gripped India, and together with them metropolitanization of cities has also been happening. It is expected that the *metro* class cities (cities with more than 1 million population) shall have the mass urban transport systems in order to sustain their growth and function efficiently on that scale. All the three modes of transport-rail, road and water-can play an important role in the development of suitable transport system in Indian cities. This paper evaluates the attempts to provide mass urban transport systems in the three major metropolitan cities in India-Mumbai, *Delhi* and Ahmadabad. It brings out the features for each of them, which refer to different systems of transport. The learning and way forward for the remaining *metro* cities have also been spelt out.

Coordination as a Strategy for Serving the Transportation Disadvantaged

A comparative framework of Local and State Roles: Given many public services previously delivered by federal and state entities continue to devolve to more *local* levels of service delivery and programmatic control, interorganizational coordination serves as an approach for the public sector to ensure that services are efficiently delivered in a no duplicative manner. This article explores the issue of coordination by examining three different policy approaches toward *local* coordination of *transportation* services for the *transportation* disadvantaged. *Local transportation* services for the disadvantaged are often delivered by a variety of nonprofit organizations, operated independently by multiple entities in a community, and result in duplicative, overlapping, and uncoordinated services. The analysis concludes that although coordination sounds like an easy and magical policy solution to be effective, state-level policies must, at a minimum, target and fund the coordination process.

Carpooling-A Step to Reduce Congestion

India is undergoing rapid urbanization. More people than ever before will be living and working in cities, more people and more goods will be making greater and longer trips in urban areas. The costs of increasing dependence on cars is resulting in expensive road building and maintenance, clogged and congested roads, high levels of energy consumption along with its economic and environmental costs, worsening air and noise pollution, traffic accidents and social inequities that arise when the poor find *transportation* services increasingly unaffordable. The most widely used mode of conveyance of public transport in *Delhi* is buses. Thus buses form a backbone of the *transportation* system in *Delhi* and serve about half of the travel demand while it constitutes less than 1 % of the total vehicle fleet of *Delhi*. In spite of this, it does not receive any preferential treatment in terms of traffic management, dedicated lanes, and better upkeep/ maintenance of vehicles resulting in that common man who can afford even slightly is shifting from buses to their own vehicles. Two-wheelers, four wheelers or even bicycles are other vehicles on the roads which are leading to further lowering of speed, congestion, increase in pollution level. Strategies to combat these problems would include reducing the emissions per vehicle kilometer traveled and the total number of kilometers traveled. Road congestion may be reduced by the use of good public transport management, traffic management and car pools etc. A survey based on a structured questionnaire for carpooling was conducted. By the analysis of the data collected, it was found that if there is no carpooling, the amount required for 968316 Kilolitre petrol for 1289231 cars is Rs. 4213.14crores per annum while by carpooling, this amount reduces to Rs. 4213.14-1310.98 =2902.16 crores.

Symbol of Progress [Metro Rail of New Delhi]: This article originally appeared on the *Kathmandu Post*. Nepali version appeared in *Kantipur*. With prestige comes the threat to its existence. In these times when India is facing terrorist assaults every now and then, this marvelous train operation has become one of the possible targets. Which terrorist wouldn't want to hit the Metro that has become the symbol of Indian prosperity? Thus, stringent security measures have been put in place. Everyone must go through frisking and metal detectors before entering the compartments.

Delhi Metro Sets Benchmarks for Commercial Properties, by George Gonigal

The IT PARK at Shastri Park is an example, which has done wonders for properties around. Today there are over 3,000 employees commuting everyday to the IT Park in Shastri Park, from various parts of Delhi NCR. There is a surge in property demand from corporate as well and after the absorption of space in one block by Genpact, the second one will be ready by December 2007 and will be taken up by Accenture. Plans for Block 3 are in the pipeline and tendering is taking place. The rental values in this part of Delhi here have escalated from Rs 40 per sq. ft per month to Rs 60 per sq ft per month and additional Rs 6-per sq. ft per month is further added over the rental value for maintenance. The coming up of IT Park has positively impacted the Shastri Park area, and has changed the profile of real estate markets- now malls are coming up in vicinity such as Welcome and Shahdara station.

GIS based Composite Delhi Metro Map for Reduced Vehicular Pollution

(Dr. Subhan Khan, Mr. Deepak Goel & Ms. Gulshan National Institute of Science, Technology and Development Studies): The use of GIS is extremely advantageous for urban networks such as railway network and road network. In the present study, the PC ARC/INFO is used along with other software to generate the composite Delhi metro map. The main outputs of the study was GIS based composite Delhi metro map for reduced vehicular pollution containing length in kilometer - underground; elevated; surface; MRTS stations; depots; high priority high capacity bus systems (HCBS) corridors and priority HCBS corridors; electric trolley bus HCBS, etc. It was possible to have a digital metro map for the city and to create data tables connected directly to it at a proper scale, which enable a complex network to be easily and economically maintained effectively. This would also help to decrease costs and increase people's standard of living, take less time and less excavation and road repair works in the city.

Traffic and Pollution Solution

The system is already helping to take the edge off Delhi's mammoth traffic and pollution problems. An average of 500,000 commuters travel underground daily instead of driving their own cars and scooters or packing into buses. As a result, authorities say, pollution levels in Delhi are down by a third, and they see no need to add to the city's fleet of 7,500 buses. Congestion has eased to where those buses now travel an average of 11 mph. That's up from around 8 mph before the metro was built—a serious achievement in a city with world-class traffic jams.

Objective of the Study

- To study and analyze the transforming effect in Delhi's overall picture with the introduction of Delhi Metro.
- To analyze the preference made by Delhi people for traveling in Delhi Metro over other means of transportation.
- To study and analyze the impact of Delhi Metro on Social aspect and Economic aspect of Delhi.

RESEARCH METHODOLOGY

Research methodology required field work – it required survey to collect data base from people. The study is based on Primary data which was collected through Questionnaire and direct communication with people. The area selected to generate responses were in Delhi Metro where genuine responses could be generated. There is a defined sample size for the collection of data. Sample size of 210 was chosen.

DATA ANALYSIS

Computation of Chi Square

The Chi Square is computed by keeping in mind the annual incomes of people and their frequency of travel with the following Hypothesis:

- H₀:** How often a person travels by Metro is Independent to his income;
- H₁:** How often a person travels Metro depends upon his income;

If chi square is more than 0.05 then accept the null hypothesis, otherwise reject it. Therefore, we reject the null hypothesis which means that people of all income group travel through Delhi Metro. They are not dependent upon their income group.

Table 1: Chi-Square Tests

	Value	df	Asymp.Sig.(2-sided)
Pearson Chi-Square	81.188 ^a	9	.000
Likelihood Ratio	88.033	9	.000
Linear-by-Linear Association	10.266	1	.001
N of Valid Cases	210		

a. 5 cells (31.3%) have expected count less than 5. The minimum expected count is 1.49.

Measures of Central Tendency

Statistics		
	For what Reason do you Travel by Delhi Metro?	How did the Introduction of Delhi Metro Influence your Decision?
Valid	210	210
Mean	2.7857	2.9857
Median	3.0000	3.0000
Mode	4.00	3.00
Std.Deviation	1.47281	.87210
Variance	2.169	.761
Sum	585.00	627.00

The analysis shows that the reason for traveling in Delhi Metro has influenced their decision to use it.

Rating of Delhi Metro Station on the Basis of Following Parameters

Parameters	Excellent	Good	Okay	Poor	Very Poor
Cleanliness	38.6%	52.9%	8.6%	-	-
Ambience	23.8%	59%	17.1%	-	-
Information	47.6%	41.9%	10.5%	-	-
Available Assistance	40.5%	42.9%	16.7%	-	-
Toilet Facilities	-	-	-	30.5%	69.5%

According to the survey, the respondents feel that the metro stations and platforms ambience is good, cleanliness is excellent, information availability is excellent, available assistance is good. However, the toilet facility is very bad.

Rating of Delhi Metro Train on the Basis of Following Parameters

Parameter	Excellent	Good	Ok	Poor
Traveling Frequency	21.90%	45.20%	32.90%	0
Stoppage Time	0	22.40%	47%	30.50%
Onboard Facilities	1.40%	25.20%	56.70%	16.70%
Onboard Information	44.80%	42.90%	12.40%	0
Temperature	15.70%	50%	33.80%	0.50%
Punctuality	35.70%	53.80%	10%	0.50%
Cleanliness	42.40%	42.90%	14.80%	0

Both the metro stations as well as metro trains are maintained in good conditions. They are clean and hygienic. Most of the respondents feel that the Metro trains are good and there is further scope of improvement.

RECOMMENDATIONS

The research shows that the introduction of Metro services in Delhi has changed their preferences to use it. According to the people surveyed they feel that the Delhi Metro is providing good services which can further be improved. Certain recommendations are as follows; Metros sometimes become very crowded especially during peak hours of morning and evening. Therefore human traffic should be taken care of. Moreover, there should be separate ladies department in Metro trains so that journey for ladies becomes more comfortable, easy and safe. There should be some eating outlets available at the Metro Station so that the commuters can relax. Further there should be more dustbins on station as well as metros. The toilet facility at Delhi Metro station as well as Metro trains is very bad. Therefore the number of restrooms at station and trains should be increased keeping in mind the health and hygiene of the commuters. Delhi Metro should cover the entire Delhi and NCR region as soon as possible. Moreover, the frequency as well as the stoppage time of Metros should also be increased. Moreover, keeping in mind the level of crowd and the increasing terrorism in the country, Safety and Security conditions should be taken care of both at the station as well as the metros.

FINDINGS AND CONCLUSION

The Delhi Metro planned in four phases is a part of an Integrated Multi Mode Mass Rapid Transport System (MRTS) which has been planned for dealing with the fast growing passenger traffic demand in Delhi. It has become an alternative convenient and comfortable mode of travel in Delhi which caters to a large fraction of passengers using the road transport in Delhi. It reduces the travel time of people using road, number of accidents and atmospheric pollution.

The survey shows that the introduction of Metro services in Delhi has changed their preferences to use it. People belonging to the all income group particularly the middle class use metro most frequently. It is however not dependent on the income group of people. Many of them use the metro services for going colleges or for business purposes. They use the metro services because it is more convenient and time saving. Further, in order to avoid the stress of driving people use metro services. According to the people surveyed they feel that the Delhi Metro is providing good services which can further be improved. People belonging to all income group particularly the middle class use metro most frequently. It is however not dependent on the income group of people. Many of them use the metro services for going colleges or for business purposes. According to the people surveyed they feel that the Delhi Metro is providing good services which can further be improved. The progress of Delhi Metro services can be seen which shows that it will be undertake more ridership soon.

The research shows that buses is the near competitor for Metros since buses are available easily and metros will still take some time to provide better connectivity within Delhi / NCR region. The progress of Delhi Metro services can be seen which shows that it will be overtaking the bus rider ship soon.

Table 2: Bus is the Near Competitor of Metro

Issue	Bus	Metro
Capacity	The capacity of buses to carry passengers is low as compared to Metros	Metros have greater capacity to carry more passengers and as a faster mode
Accidents	Buses are more prone to accidents because of the traffic congestions and rash driving	Metros are relatively safer because they have separate tracks to travel.
Travel Timings	If only in-vehicle time is considered it takes more time than metro	If only in-vehicle time is considered it takes less time than bus
Time	Buses stop at each stop and taken in large chunk of people thus making it very crowded	Metros have less stoppage and therefore offers greater speed and is time saving

REFERENCES

- [1] "A Comparative Study of Executive and Non Executive Associates of DMRC for their Level of Commitment and Personal Efficiency" | Professor of Organizational Behavior, Human Resource Management, Technology and Change Management and Communication, University School of Management Studies (USMS), Guru Gobind Singh Indraprastha University, Delhi | University School of Management Studies, Guru Gobind Singh Indraprastha University, Delhi.
- [2] Carpooling (2007), "A Step to Reduce Congestion: Engineering Letter" Vol. 14 Issue 1, pp61-66.
- [3] "Coordination as a strategy for serving the transportation disadvantaged: A comparative framework of Local and Studies.
- [4] Roles: Public Works Management & Policy" (2004) Vol.9 Issue 2, pp132-144.
- [5] <http://ideas.repec.org/p/prs/mprapa/1658.html>
- [6] <http://www.gisdevelopment.net/application/environment/air/ma03216.htm>
- [7] http://www.streetdirectory.com/travel_guide/68781/india_properties/delhi_metro_sets_benchmarks_for_commercial_properties.html
- [8] <http://www.wagle.com.np/dinwag/dinesh-wagle-blog/2008/12/27/symbol-of-progress-metro-rail-of-new-delhi/>
- [9] ICFAI Journal of Infrastructure; Dec2008, Vol. 6 Issue 4, pp36-47, 6 charts.
- [10] Khan, Dr. S., Goel D. and Gulshan, "GIS based Composite Delhi Metro Map for Reduced Vehicular Pollution", National Institute of Science, Technology and Development Studies.
- [11] Mass Urban Transportation in India- Features of three models and learning:
- [12] Message in a Metro- Building Urban Rail Infrastructure and Image in Delhi, India: International Journal of Urban & Regional Research; Jun2006, Vol. 30 Issue 2, pp277-292.
- [13] Murty, M.N., Dhavala, K.K., Ghosh, M., and Singh R. "Social Cost-Benefit Analysis of Delhi Metro"
- [14] Survey of Delhi Metro using equipments developed in UK: Conducted by the Indian Institute of Technology, Delhi, and using equipment developed in the United Kingdom.

ANNEXURE

Table 1: What is Your Annual Income; How Often Do u Travel by Metro; (Cross Tabulation)

		How Often do u Travel by Metro				Total
		Daily	Weekly	Monthly	Few Times a Year	
what is your Annual Income	less than 2 lakhs	17	6	21	24	68
	above 2 lakhs	53	17	15	7	92
	above 5 lakhs	3	3	8	24	38
	above 10 lakhs	0	0	1	11	12
Total		73	26	45	66	210

Table 2: How Much Did the Introduction of Delhi Metro Influence Your Decision to use Metro Services?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Did not influence at all	10	4.7	4.8	4.8
	Influenced very little	50	23.7	23.8	28.6
	Somewhat influenced	82	38.9	39.0	67.6
	Greatly influenced	68	32.2	32.4	100.0
	Total	210	100.0	100.0	
Total		210	100.0		

Table 3: Why do you use Delhi Metro?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saves time	15	7.1	7.1	7.1
	Saves money on auto expenses	39	18.5	18.6	25.7
	Environment friendly	14	6.6	6.7	32.4
	Do not own a vehicle	63	29.9	30.0	62.4
	Avoids stress of driving	30	14.2	14.3	76.7
	Convenient	30	14.2	14.3	91.0
	Other	19	9.0	9.0	100.0
Total		210	100.0	100.0	
Total		210	100.0		

Table 4: If Delhi Metro had not been Made Available How Would you have Made Traveling?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Own Vehicle	42	19.9	20.2	20.2
	Taxi	13	6.2	6.2	26.4
	Walk	4	1.9	1.9	28.4
	Carpool	26	12.3	12.5	40.9
	Bus	89	42.2	42.8	83.7
	Auto	34	16.1	16.3	100.0
	Total		210	100.0	100.0
Total		210	100.0		

Poverty and Anti-Poverty Strategies in India

Minal

Faculty, Institute of Business Management, Mangalayatan University, Aligarh

Abstract—The research paper sheds light on various strategies undertaken for the purpose of rural development in India. These programmes constitute the "five year plan", for the purpose of simplicity the measures undertaken have been categorized in broad groups and then elaborated upon. In the end, an ideal model of rural development is proposed. The rural economy, as much as urban economy, is an integrated part of the overall Indian economy. Any talk of overall development without rural development, particularly in a country where three-quarters of people below the poverty line reside in rural areas, is flawed. Poverty is indeed a global issue. Its eradication is considered integral to humanity's quest for sustainable development. Reduction of poverty in India, is, therefore, vital for the attainment of international goals. Poverty alleviation has been one of the guiding principles of the planning process in India. This can be substantiated by the fact that anti-poverty programmes have been internalized in the (particularly the ninth) five-year plan. This research paper sheds light on the various programmes that form the instruments of the plan.

Keywords: Poverty, causes, rural, strategy, programmes, flaws

INTRODUCTION

Poverty is one of the most important and pressing problem facing Indian economy today. It is a socio-economic problem. The concept and content of poverty differs from country to country depending upon what a particular country accepts as a reasonably good standard of living for its people. In India, poverty levels are synonymous with deprivation, malnutrition, illiteracy, ill health and poor quality of life; a picture which is agonizing from any standard human existence.

CONCEPT OF POVERTY AND POVERTY LINE

Poverty is the lack of *basic human needs*, such as *clean water, nutrition, health care, education, clothing and shelter*, because of the inability to afford them. This is also referred to as *absolute poverty* or destitution. *Relative poverty* is the condition of having fewer resources or less income than others within a society or country, or compared to worldwide averages. About 1.7 billion people live in absolute poverty. Whether developed or underdeveloped, relative poverty exists in every country, be it U.S.A. or India. What we are concerned here is not the relative but absolute poverty. The poverty threshold or poverty line is the minimum level of *income* deemed necessary to achieve an adequate *standard of living* in a given country. The poverty line was originally fixed in terms of *income/food requirements* in 1978. It was stipulated that the calorie standard for a typical individual in rural areas was 2400 calorie and was 2100 calorie in urban areas. Then the cost of the grains (about 650 gms) that fulfill this normative standard was calculated. This cost was the poverty line. In 1978, it was Rs.61.80 per person per month for rural areas and Rs.71.30 per person per month for urban areas. Since then the Planning Commission calculates the poverty line every year adjusting for inflation. The poverty line is Rs.368 per head per month in rural India as compared to Rs.560 per head per month in urban India in 2005-2006. This income is bare minimum to support the food requirements and does not provide much for the other basic essential items like health, education etc. That is why sometimes the poverty lines have been described as starvation lines.

Magnitude of Poverty

Poverty ratio or Poverty rate gives the magnitude of poverty. Poverty ratio is the proportion of a population that lives below the official poverty line. According to Planning Commission (1999-2000), about 23.6% of the urban population and about 27.1% of the rural population lives below the poverty line. About 260.3 million persons were in a 'state of being poor', which gives the poverty ratio as 26.1% (Economic Survey, 2004-05). The data of the latest NSS 61st Round for the year 2004-05 states that poverty ratio was 22% (Economic Survey, 2006-07). The absolute number of poor is approximately 300 million in 2004-05 (11th Five Year Plan, p.71).

RURAL-URBAN BREAK-UP OF POVERTY

Poverty exists both in rural and urban areas of the country. The incidence of poverty is more in rural areas than in urban areas. About 23.6% of the urban population and about 27.1% of the rural population lived below the poverty line in 1999-2000. The projection for 2007 is that rural poverty ratio will fall to 21.1 and urban poverty ratio will fall to 15.1%. In the rural areas, poor people are those who are landless agricultural labourers, small and marginal farmers. In the urban areas, poor people are those who are unemployed, underemployed or employed in low productivity occupations with very low wages.

REGIONAL VARIATION IN INCIDENCE OF POVERTY

The incidence of poverty varies from State to State. The poorest State with the highest incidence of poverty is Orissa. According to Economic Survey, 2001-02, Orissa, Bihar, Madhya Pradesh, Assam, Sikkim and Tripura (more than 30% poverty ratio) are the backward States. Punjab, Haryana, Delhi, Daman and Diu, Jammu and Kashmir, Goa and Chandigarh (less than 10% poverty ratio) are the rich States.

CAUSES OF RURAL AND URBAN POVERTY

Almost one third of the country's population of more than 1.1 billion continues to live below the poverty line, and a large proportion of poor people live in rural areas. Poverty remains a chronic condition for almost 30 per cent of India's rural population. The incidence of rural poverty has declined somewhat over the past three decades as a result of rural to urban migration. Poverty is deepest among members of scheduled castes and tribes in the country's rural areas. In 2005 these groups accounted for 80 per cent of poor rural people, although their share in the total rural population is much smaller. On the map of poverty in India, the poorest areas are in parts of Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Jharkhand, Orissa, Chhattisgarh and West Bengal.

Large numbers of India's poorest people live in the country's semi-arid tropical region. In this area shortages of water and recurrent droughts impede the transformation of agriculture that the Green Revolution has achieved elsewhere. Women in general are the most disadvantaged people in Indian society, though their status varies significantly according to their social and ethnic backgrounds.

The causes of urban poverty are presence of educated unemployment, i.e., failure to get job for even one person in a family; inequalities in the distribution of urban property; high level of migration from rural areas; illiteracy etc.

MEASURES TO ELIMINATE POVERTY GENERAL MEASURES

A country is caught in a vicious trap once poverty is inbuilt in the system. Some of the measures to remove poverty are:

The Rate of Economic Growth Should be Raised

Economic growth can be helpful in removing poverty for two reasons.

1. Poor can directly share in the increased income generated by economic growth.
2. Overall increase in national prosperity can help in financing the public services and special programmes.

But economic growth is not a sufficient condition for removal of poverty as:

3. Poverty may not be in the form of low income, there are other kinds of deprivation.
4. The ability of the poor to participate in economic growth depends upon a variety of enabling social conditions. (Specially basic education, good health, social security arrangements, etc.).
5. The fruits of economic growth may not be automatically utilized to expand basic social services.

Various Beneficiary-oriented Programmes Need to be Strengthened

For this, local institutions have to be involved in these programmes. The activities should be organized on a co-operative basis. Major training programmes should be taken up to improve the skills of potential workers.

1. There should be substantial increase in the rate of capital formation.
2. The population growth must be controlled.
3. The poor should themselves become conscious and improve their skills and capabilities.

Special Programmes to Fight Poverty

The anti-poverty strategy has two important elements:

- To create wage or/and self-employment for the poor : It calls for policies that eradicate poverty through employment generation.
- To provide basic social services to the poor and have well targeted transfers and safety nets.

INTEGRATED RURAL DEVELOPMENT PROGRAMME (IRDP)

First introduced in 1978-79, IRDP has provided assistance to rural poor in the form of subsidy and bank credit for productive employment opportunities through successive plan periods. Subsequently, Training of Rural Youth for Self Employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA), Supply of Improved Tool Kits to Rural Artisans (SITRA) and Ganga Kalyan Yojana (GKY) were introduced as sub-programmes of IRDP to take care of the specific needs of the rural population.

WAGE EMPLOYMENT PROGRAMMES

Important components of the anti-poverty strategy, Wage Employment Programmes have sought to achieve multiple objectives. They not only provide employment opportunities during lean agricultural seasons but also in times of floods, droughts and other natural calamities. They create rural infrastructure which supports further economic activity. It encompasses National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGP) which were initially part of the Sixth and Seventh five year Plans.

EMPLOYMENT ASSURANCE SCHEME (EAS)

EAS was launched in October 1993 covering 1,778 drought-prone, desert, tribal and hill area blocks. It was later extended to all the blocks in 1997-98. The EAS was designed to provide employment in the form of manual work in the lean agricultural season. The works taken up under the programme were expected to lead to the creation of durable economic and social infrastructure and address the felt-needs of the people.

FOOD FOR WORK PROGRAMME

The Food for Work programme was started in 2000-01 as a component of the EAS in eight notified drought-affected states of Chattisgarh, Gujarat, Himachal Pradesh, Madhya Pradesh, Orissa, Rajasthan, Maharashtra and Uttaranchal. The programme aims at food provision through wage employment. Food grains are supplied to states free of cost. However, lifting of food grains for the scheme from Food Corporation of India (FCI) godowns has been slow.

RURAL HOUSING

Initiated in 1985-86, the Indira Awas Yojana (IAY) is the core programme for providing free housing to families in rural areas, targets scheduled castes (SCs)/scheduled tribes (STs), households and freed bonded laborers. The rural housing programme has certainly enabled many BPL families to acquire pucca houses, the coverage of the beneficiaries is limited given the resource constraints. The Samagra Awas Yojana (SAY) was taken up in 25 blocks to ensure convergence of housing, provision of safe drinking water, sanitation and common drainage facilities. The Housing and Urban Development Corporation (HUDCO) has extended its activities to the rural areas, providing loans at a concessional rate of interest to economically weaker sections and low-income group households for construction of houses.

SOCIAL SECURITY PROGRAMMES

Democratic decentralization and centrally supported Social Assistance Programmes were two major initiatives of the government in the 1990s. The National Social Assistance Programme (NSAP), launched in August 1995 marks a significant step towards fulfillment of the Directive Principles of State Policy. The NSAP has three components: a) National Old Age Pension Scheme (NOAPS); b) National Family Benefit Scheme (NFBS); c) National Maternity Benefit Scheme (NMBS). The NSAP is a centrally-sponsored programme that aims at ensuring a minimum national standard of social assistance over and above the assistance that states provide from their own resources.

LAND REFORMS

In an agro-based economy, the structure of land ownership is central to the wellbeing of the people. The government has strived to change the ownership pattern of cultivable land, the abolition of intermediaries, the abolition of zamindari, ceiling laws, security of tenure to tenants, consolidation of land holdings and banning of tenancy are a few measures undertaken. Furthermore, a land record management system is a pre-condition for an effective land reform programme. In 1987-88, a centrally-sponsored scheme for Strengthening of Revenue Administration and Updating of Land Records (SRA & ULR) was introduced in Orissa and Bihar.

FLAWS IN ANTI-POVERTY PROGRAMMES

Although these special programmes undertaken have been successful in curbing poverty to some extent, the flaws they have are as follows:

Inadequate Financial Limits

The financial limits of investment in different schemes are centrally fixed without reference to actual costs. The amount actually transferred to the beneficiary bears no relation to the investment required by beneficiary household to become viable. The assessment of IRDP shows that about 70% of poor households who were assisted were able to raise their income. However, the rise in income was sufficient to cross the officially set poverty line in about 15% of the cases.

Lack of Interest

The schemes are administered by over burdened block development officers who are unlikely to be familiar with the local situation.

Poor Targeting

The evaluation of the programmes also indicate that the programmes have been most successful in areas experiencing fast agricultural growth and where the beneficiaries are located below but near the poverty line and their integration with the growth process did not require conscious efforts.

Accountability

The accountability for ensuring proper choice of beneficiaries and proper use of funds remains a serious problem. No one is held accountable if wrong projects are launched or wrong beneficiaries are chosen.

CONCLUSION

There is immense scope for improving the efficiency of anti-poverty programmes. According to the planners of the 11th five year plan, this can be done by better targeting, reducing waste and corruption, creating institutional conditions for greater accountability, greater coordination, better designing, avoiding duplication and overlapping of programmes. This will not only help reduce this imbalance but will have a multiplier effect on the overall economy. By aligning the goals of the two parts we can convert this seemingly zero sum game into a win-win situation. It would be a very long drawn and difficult battle with conventions but the reward is worth the effort.

REFERENCES

- [1] Dr. Deepashree, Indian Economy – Performance and Policies, Tata McGraw-Hill Publishing Company Limited, New Delhi.
- [2] Misra, S.K. and Puri, V.K., Indian Economy, Himalaya Publishing House, New Delhi.
- [3] Prasad, K.N., Indian Economy – Before and since the reform, Atlantic Publishers and Distributors, New Delhi.
- [4] Vaidyanathan, A., The Indian Economy: Crisis, response and prospects, Orient Longman Limited, New Delhi.
- [5] [.msn.com/dictionary/poverty_rate](http://msn.com/dictionary/poverty_rate)
- [6] www.country_data.com
- [7] www.economictimes.com
- [8] www.gov.bih.nic.in/schemes.htm
- [9] [www.indianchild.com/poverty in india.htm](http://www.indianchild.com/poverty_in_india.htm)
- [10] www.infoaworld.com
- [11] www.karmayog.org
- [12] www.kurukshetramagazine.com
- [13] www.ruralpovertyportal.org
- [14] www.yojana.com

Contents

<i>Messages</i>	v
<i>Foreword</i>	ix
<i>From the Desk of Conference Convener</i>	x

SESSION I

1. Doing Business in India: International Perspectives (With Particular Reference to Business Process Outsourcing (BPO) Industry) <i>James Ondracek, Andy Bertsch, M. Saeed and Matthew Cohen</i>	3
2. Mobile Agents and Its Uses in E-commerce and Internet <i>Rashmi Priya</i>	12
3. An Overview of Security Issues in Grid Computing <i>Santosh Kumar Singh, Ranjeet Kumar Singh and Ganesh Gupta</i>	16
4. EHR and its Impact in Health Informatics <i>Mukesh Joshi</i>	21
5. Knowledge Discovery and Data Mining <i>Harish Kumari</i>	24
6. Test Case Effectiveness of Higher Order Mutation Testing <i>Shalini Kapoor</i>	28
7. Image based Dual Level Authentication System <i>Vaibhav Sharma, Gulista Khan, Dhanshree Gupta and Hari Om Sharan</i>	32
8. Comparative Study of Different Operating Systems <i>Neetu Goel</i>	35
9. Reliable Confidentially Conserving Hierarchical Position Service for MANETs <i>Amit Upadhyay and Lalit Johari</i>	41
10. A Novel Designing Methodologies for Artificial Intelligent Agents <i>Ashish Bishnoi and Harsh Kumar</i>	45
11. Implementation of Semantic Web in Social Computing: Review <i>Akanksha Chandola and Tushar Anthwal</i>	48
12. Simulation based Analysis of AOMDV using NS2 and Throughput Comparison with DSR <i>Alpna Bansal, Shikha Garg and Pooja Narula</i>	50
13. Boom of Artificial Intelligence <i>Indu Tripathi</i>	55
14. Data Mining: Process, Techniques and Scope in Competitive Intelligence <i>Palak Gupta</i>	57
15. Impact of Internet on Banking Sector <i>Mukta Sharma</i>	62
16. E-Learning: A Need of Today's Market <i>Surbhi Dwivedi and Mukta Sharma</i>	68
17. Cyber Laws: A Prerequisite against Cyber Crime <i>Shikha Garg, Gulista Khan and Swati Verma</i>	73
18. Future Aspects of Digital Watermarking and Multimedia Security using Steganography <i>Ishuita Sengupta, Mragank Singhal and Deepak Sharma</i>	78
19. Implication of Information Technology for Teacher Education <i>Jyoti Puri</i>	84

Micro Insurance: A Tool for Socio-Economic Transformation

Vijay Kumar Gangal¹ and Kirti Singh²

¹Director, Ashoka Centre for Business & Computer Studies,

Nashik Business Economics & Ashoka Business School, Nashik, (Maharashtra)

²Research Scholar & Faculty, Department of Applied Dayalbagh Educational Institute (Deemed University), Agra

Abstract—With a population of 1.2 bn, India is the second-most populated country in the world. Though, in recent years, strong GDP growth has been experienced, yet percentage of persons living below poverty remains is too high, especially among the 70% of the population that resides in rural areas. In decade of 50, Government of India nationalized insurance industry and liberalized in 1999 to allow private insurers. Since then insurance premiums have grown rapidly. India is unique in that the government plays a proactive role in providing insurance to the very poor (those below the \$1/per day threshold) through various social security programmers and subsidized insurance schemes. Therefore the micro insurance market in India should largely be regarded as the low-income population living on less than \$1/day. The paper discusses the issues and concludes that 'broad' social- economic transformation in Indian low-income market which creates enormous scope and need for micro insurance which has an important role in interrupting risk and vulnerability among the chronic poor.

Keyword: Micro insurance, Low income, Need, socio-economic, transformation

Micro-insurance is the tool of financial inclusion developed to alleviate poverty and low-income people from specific perils. Micro insurance includes all principles of insurance in general, but products and services are designed to view the requirements of financially and socially backward people who are situated at the bottom of the pyramid.

Micro insurance is featured by low coverage limit, low premium and typical risk pooling. The marketing of micro insurance products are designed to reach low income group effectively.

"Micro insurance is the protection for the low -income population against specific dangers in exchange for regular payments of proportional premiums to the probability and costs of the involved risks."¹

Micro-insurance is therefore designed with the objective of protecting poor people and also designed with the environment that surrounds them, their needs, and possibilities. It is necessary that the product is developed for people ignored by traditional insurance markets.

By helping low-income households manage risks, micro-insurance can assist them to maintain a sense of financial confidence even in the face of significant vulnerability. If governments, donors, development agencies and others working for the welfare of the poorer community are serious about combating poverty, insurance has to be one of the weapons in their arsenal.

The chief players involved in micro-insurance in Indian market are:

- Insurance Companies; (e.g., LIC, TATA AIG Insurance, SBI Insurance, & Bajaj Allianz etc.)
- Micro-Finance Institutions; (e.g., Asmitha microfinance Ltd., SKS microfinance Pvt. Ltd., Grameen Kota, Sadhana microfinance society, Microcredit foundation of India, & Micro Save, etc.)
- Non-Governmental Organizations (NGOs);
- Banking Institutions
- Central/State Governments;
- Co-operative Societies;
- Village councils (Panchayatsamitis);
- Employers' Organizations;
- Health Providers & various other third parties related to health insurance

Micro-Insurance Historical Background

"Government of India and certain NGOs started the micro-insurance scheme in India. Although the reach of these insurance schemes is limited only to the 10 million individuals but there is a huge potential seen in the near future. The overall market is estimated to reach Rs. 250 billion by 2008 (ILO 2004)"².

"For micro-insurance facilities to be available to the poor, the IRDA has divided the poor block of people under the two broad categories which are:

- a. Rural sector,
- b. Social sector. "³

And there are the obligations set by the IRDA to be fulfilled in both of these sectors. These obligations are:

- The rural obligations are in terms of certain minimum percentage of total policies written by life insurance companies and, for general insurance companies, these obligations are in terms of percentage of total gross premium collected.
- The social obligations are in terms of number of individuals to be covered by both life and non-life insurers in certain identified sections of the society.

In order to fulfill all these requirements of “IRDA all the insurance companies have designed products especially for the poorer sections, rural sections and also for the low income group. These insurance companies in collaboration with the nodal agencies have been able to cater to the low-income segment of the economy”.⁴ These nodal agencies which organize the poor, impart training, and work for the welfare of the low-income people play an important role both in generating both the demand for insurance as well as the supply of cost-effective insurance.

Table 1: Difference among Micro Insurance and Traditional Insurance

Basis	Traditional Insurance	Micro Insurance
Target Market	<ul style="list-style-type: none"> • High and medium income individuals • Market is largely aware of insurance benefits 	<ul style="list-style-type: none"> • Low income individuals • Extremely limited Insur. awareness/ knowledge
Product Design	<ul style="list-style-type: none"> • Multiple coverage and features • Risk-based pricing driven by multiple parameters; good data quality 	<ul style="list-style-type: none"> • Simple product design with easy-to-understand features • Community or group pricing; limited actuarial data
Marketing and Distribution	<ul style="list-style-type: none"> • Employ conventional channels including agents, banks, internet • Insurance sold by licensed intermediaries 	<ul style="list-style-type: none"> • Innovative distribution with multiple tie-ups • Usually sold as combined product through micro finance institutions
Underwriting	<ul style="list-style-type: none"> • Comprehensive underwriting; large sum assured • Complex language with multiple exclusions and terms and conditions 	<ul style="list-style-type: none"> • Simple underwriting practices; Small sum assured • Simple policy language with minimal or no exclusion
Administration	Regular payment paid by cheque, direct bank debit, credit card	Irregular premium payments, by cash or bundled with other products
Claims Handling	Comprehensive process; detailed documentation	Simple and quick claim turnovers process; limited documentation
Asset Management	As per regulatory norms or investment rules of the risk-carriers.	As per regulatory norms or investment rules of the risk-carriers.

(Source: Sigma report 2010: Micro insurance-Risk Protection for 4 billion people)

NEED OF THE STUDY

Micro-insurance is a key element in the financial services package for people at the bottom of the pyramid. The poor face more risks than the well-off, but more importantly they are more vulnerable to the same risk. Usually, the poor face two types of risks – idiosyncratic (specific to the household) and covariate (common, e.g., drought, epidemic, etc.). To combat these risks, the poor do pro-active risk management – grain storage, savings, asset accumulation (especially bullocks), loans from friends and relatives, etc. However, the prevalent forms of risk management (in kind savings, self-insurance, mutual insurance) which were appropriate earlier are no longer adequate.

Thus, in this paper an attempt has been made to know the importance of micro insurance that how it is helpful in socio-economic transformation of low income people.

GOVERNMENT AND PRIVATE COMPANIES INITIATIVES

A complete list of Micro-insurance products currently available in the market is provided below in table 2:

Table 2: Micro Insurance Products Currently Available To the Companies

Finan-cialYear	Name of Insurer	Name of the Product	Inoperation From (Opening Date)	Remarks
2007-08	Bajaj Allianz Life Insur. Co. Ltd.	Bajaj Allianz Jana Vikas Yojana	4/Apr/07	Single Premium Life Insurance
2007-08	Bajaj Allianz Life Insur. Co. Ltd.	Bajaj Allianz SaralSuraksha Yojana	4/Apr/07	Term Assurance
2007-08	Bajaj Allianz Life Insur. Co. Ltd.	Bajaj Allianz Alp Nivesh Yojana	4/Apr/07	Endowment Plan
2007-08	AVIVA Life Ins.Co.India Pvt.Ltd.	GrameenSuraksha	16/Mar/07	Term Assurance
2007-08	Birla Sun Life Insur. Co .Ltd.	Birla Sun Life Insurance BimaSuraksha Super	13/Aug/07	Life Insurance
2007-08	Birla Sun Life Insur. Co.Ltd.	Birla Sun Life Insurance BimaDhanSanchay	13/Aug/07	Endowment + LI
2008-09	ICICI Prudential Life Insur. Co. Ltd	ICICI PruSarv Jana Suraksha	2/Jun/08	Term Assurance
2007-08	ING Vysya Life Insur. Co.Ltd.	ING VysyaSaralSuraksha	3/Sep/07	Life Insurance
2006-07	Life Insur. Corporation of India	LIC's JeevanMadhur	14/Sep/06	Endowment + LI
2009-10	Life Insur. Corporation of India	LIC's JeevanMangal	4/May/09	Term Assurance

Table 2 (Contd.)...

... Table 2 (Contd.)

2008-09	Met Life India	Met Vishwas	2/Jun/08	Single Prem. Term Assur.
2007-08	SBI Life Insur. Co. Ltd.	SBI Life Grameen Shakti	6/Sep/07	Group Micro Insurance
2007-08	SBI Life Insur.Co. Ltd.	SBI Life Grameen Super Suraksha	6/Sep/07	Group Term Assurance
2006-07	TATA AIG Life Insur. Co.Ltd.	AyushmanYojana	30/May/0	Single Premium LI
2006-07	TATA AIG Life Insur. Co. Ltd.	NavkalyanYojana	30/May/0	Term Plan
2006-07	TATA AIG Life Insur. Co. Ltd.	SampoornBimaYojana	2/Jun/06	Endowment + LI
2008-09	TATA AIG Life Insur. Co. Ltd.	Tata AIG SumangalBimaYojana	3/Jun/08	Limited Payment Money Back
2007-08	Shriram Life Insur. Co. Ltd.	ShriSahay	7/Feb/07	LI
2007-08	Shriram Life Insur. Co. Ltd.	Sri Sahay (AP)	24/Apr/07	LI
2008-09	IDBI Fortis Life Insur.Co.Ltd.	IDBI Fortis Group Microsurance Plan	5/Nov/08	Group Micro Insurance
2008-09	DLF Prameric Life Insur. Co. Ltd	DLF PramericaSarvSuraksha	16/Mar/09	Group Term MicroInsurance
2008-09	Star Union Dai-ichi LifeInsur. Co Ltd.	SUD Life ParasparSurakshaPlan	17/Mar/09	Group Micro Insurance

(Source: IRDA website)

OBJECTIVES OF THE STUDY

1. To find the awareness of micro insurance among the people living at the bottom of the pyramid.
2. To find the customer need and preference of various products of micro insurance.
3. To estimate the minimum amount of premium which poorest group of society agrees to pay.

RESEARCH METHODOLOGY

This paper is based on both primary and secondary data. A questionnaire/ schedule has been prepared to know the awareness, need of Micro insurance among poor people and find out the minimum amount of premium they are ready to pay. Primary data have been collected from weaker section of the society of Agra City through structured questionnaires/ schedule conducted among 500 respondents. Out of 500, 135 did not give any response. 58 questionnaires were incomplete and not included in study. For analysis 163 who were not aware about micro insurance have been left out.

Secondary data have been collected from various official sites i.e., www.irda.org.in, www.adl.com/microinsurance, www.microsave.org and <http://www.ilo.org> etc. The study has been carried out from June to August 2011.

Table 3: Analysis of Data

Profile of Respondent	
Occupation	Percentage of Respondent
Shoe Workers	38%
Petha Workers	24%
Gate Keepers	16%
Auto & Riksha Pullers	22%
Annual Family Income	
Income (Rs.)	Percentage of Respondent
Less than 15000	12%
15000-30000	46%
30000-45000	31%
Above 45000- Below 60000	11%
Size of Family	
No. of Family Members	Percentage of Respondent
2	4%
3	5%
4	27%
5	32%
6	26%
More than 6	6%

(Source: Survey Analysis)

Table 3 is showing the respondents profile all of the respondents are daily earners, chosen randomly, with age more than 25 years. Maximum respondents are shoe workers and Petha workers, some of them are college, Hostel and banks gate keepers. Major portion of respondents belongs to income group 15000-30000; only 11% respondent's family income is more than 45000 thousands as there is more than one earner in their family.

Table 3 also shows, most of the respondents are married having one or two children. 32% of respondents have family of size 5, 27% and 26% of respondents live in a family of 4 and six respectively.

Table 4

Respondent Awareness About Micro Insurance	
Awareness	Percentage of Respondent
Yes	47%
No	53%
Investment in Any Insurance Policy	
Have Policy	Percentage of Respondent
Yes	43%
No	57%

(Source: Survey Analysis)

From table 4 is clear that majority of respondent are unaware about micro insurance (53%) and till now not invested in any insurance policy (57%). Only 47% respondents are aware and 43% have insurance policy.

Table 5

Reason for Taking/ Will Take Micro Insurance	
Reasons	Percentage of Respondent
To fulfill the basic needs	31.04%
Deal with emergencies like illness, flood, death etc.	43.28%
Improve standard of living	25.64%

(Source: Survey Analysis)

Table 5 displaying that maximum percentage of respondent taking micro insurance so that they can easily deal with emergencies like death, illness i.e., 43.28% where as to fulfill the basic needs is the second most reason for taking micro insurance by low income people.

The table 6 is showing the two things together the most reliable source of taking micro insurance and the most preferable insurance company by respondents.

Table 6

Most Reliable Sources of Taking Micro Insurance	
Sources	% of Respondent
Public Insur. Co.	34.67%
Private Insur. Companies	21.86%
Self Help Groups	8%
Co-operative Societies	10.13%
Post Office	12.34%
Others	13%
Most Preferable Insurance Company By Respondents	
Companies	% of Respondent
LIC	32.12%
TATA AIG	14.23%
BAJAJ	12.32%
SBI	12.3%
ICICI	9%
HDFC	14.03%
Other	6%

(Source: Survey Analysis)

Most of the respondents rely on public insurance company followed by private insurance companies contributing about 56.53% as their reliable source of taking micro insurance and then post office i.e., 22% whereas co-operative societies and others contribute about 23.13% for total respondents whereas self-help group have just 8% showing that self-help should be formed in Agra as we know that self-help group have played a very significant role in the south India for helping low income people.

From Table 6 it is also clear LIC of India is the utmost preferable company by customers because it's a public sector company and low income people generally trust government. Therefore they mostly go for public sector Company instead of private.

It is inferred from the table 7 that 44% of total respondents are agree to pay micro insurance premium up to 85 per annum whereas 32% respondents are willing to pay premium 90 per annum belong to low income group. On an average people are ready to pay Rs 85 per annum as premium.

Table 7

Amount of Premium Respondent Willing to Pay Towards Micro Insur.		
Amount Of Premium Per Annum	Number of Respondents	Percentage of Respondent
75	14	4%
80	68	20%
85	148	44%
90	107	32%
Mean = 85 & Stander Deviation = 4.14		

(Source: Survey Analysis)

Table 8

Micro Insurance a Tool to Eradicate Poverty	
Options	Percentage of Respondent
Yes	59%
No	23%
Can't say	18%

(Source: Survey Analysis)

Most of the respondents feels that micro insurance will help to eradicate poverty i.e. 59% of the respondents as it have helped them to earn their livelihood where as 23% says no and rest were not able to make their judgment on this issue.

Table 9

Anticipated Future of Micro Insurance							
Prosperous	Scale	1	2	3	4	5	Non-prosperous
	Number of respondent	98	78	73	53	35	

(Source: Survey Analysis)

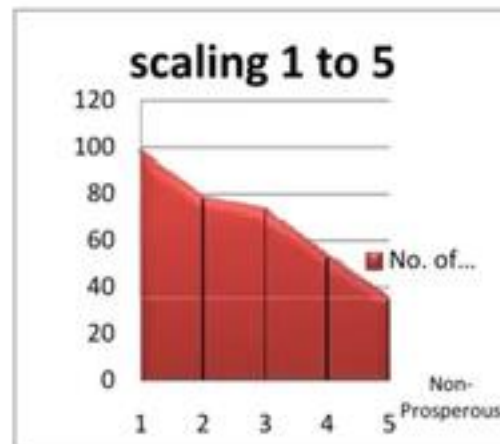


Fig. 1

(Source: Survey Analysis)

The Table 9 and figure 1 displays that the future of micro insurance in Agra is going to be prosperous as most of the respondents are between the scaling rates of 1 to 2 i.e. about 176 out of 500 respondents.

FINDING

- Maximum of respondents were daily earners their income varies from season to season, in their peak seasons they earns 200-300 per day but in off season their earning decreases significantly, those respondents who were salaried people get monthly salary ranging from 3000-5000 per months.
- Most of respondents are married having one or two children. 34% of respondents have family of size 5, 27% and 28% of respondents live in family of 4 and six respectively. Those families which have five or more than five members; they generally live in combined family and these families have income level more than five thousand per month.
- Most of the respondents have heard about insurance but they are totally unaware of Micro insurance, they believe depositing their money in bank or post-office is more profitable than putting money in insurance; also ease of withdrawing money from bank and post-office makes their investment more liquid.

- Only 43% respondents have invested in insurance policy, all of them belongs to income level of more than RS.45000 Per annum out of which 2 have invested their money only for one and 3 years only and they stopped giving premium for their insurance due to some problems and all of them invested in LIC's policy.
- After explaining those about need and benefits of insurance respondents want to invest in insurance policy to deal with emergencies, to fulfill basic necessities of life but lack of knowledge and awareness about micro insurance stop them for investing. Many of them told that they don't need insurance as there is very low chance miss happening totem. In spite of they are more vulnerable to risks; negligence and ignorance of risk for their health or life also prevent them for investing in insurance.
- Maximum of respondents choose government companies rather than private insurance firms as they think they are cheaper, reliable and ease in claiming insurance money.
- Most of the respondents have taken micro insurance from LIC i.e. about 32.12 % followed by TATA AIG which is about 14.26% whereas ICICI, Bajaj and SBI insurance are not being regarded as better source for taking micro insurance in Agra.
- Majority of the individuals have the capacity to pay premiums towards insurance. On an average they have capacity to pay Rs. 85 per annum per head. This indicates that there is enormous scope for the insurance companies to innovate micro insurance products which should be affordable by the poor.
- An appropriate premium has to be devised which suit the pocket of the poor. This will be done by offering micro insurance products to this sector of society.
- About 59% of the total respondents say that, it will help to remove the poverty so it can be seen as tool to remove poverty from Agra.

SUGGESTIONS

- People should be made aware about Self-Help Groups and various steps should be taken by various Private and Public banks to form Self Help Groups among masses.
- Various NGO's should come forward to help poor people by helping them to provide micro insurance at low premium rates so that they can deal with risks and shocks.
- People's reliability over Local-money-lenders should be tried to decrease as they exploit poor and making them fool.
- There should be MFI's such as SSK working in South India, which is not only working successful but also main reason for the success of micro insurance in South India and also there is a need to establish a council of micro insurance representatives, regulator and government. This body should meet on a regular basis to discuss the issues and strategies to develop the sector. This body can also help to develop regulations. It could help facilitate the sharing of information between insurers.
- Most MFIs and insurance companies are willing to start life insurance schemes since it is easy to design and operate and its fund generation prospect is good; but actual need in the market is for quality health care, agriculture & assets etc therefore they should also focus on this.
- Low income people have fluctuations in income patterns and flow. Premium collection should consider these fluctuations, and should coincide with maximum flow and minimum variations. Also it could be integrated with saving or loans so that it eases out the pressure for money at the people's side.

CONCLUSION

This field of micro insurance is just emerging and through it has number of issues at all the three levels- people, Insurance companies and MFI's, this sector has big potential. More innovation in product design, processes and practices is bound to happen as the sector evolves and expand. The survey confirmed results of qualitative research that needs for micro insurance among poor and vulnerable households in Agra are very high. These needs are much more accentuated among lower income group. Given that micro insurance is an unknown service for majority of Agra people, the effective demand declared by survey households is substantial. The market development projections show that the market for all three micro insurance products (health, life, property) is prospective in short-term.

REFERENCES

- [1] Craig Churchill, Protecting the poor-Amicro insurance compendium, Munich Re Foundation from Knowledge to Action; by international labor organization.
- [2] Micro insurance-risk protection for 4 billion people; Sigma report, November 2010
- [3] Mitra, Dr. Debabrata & Ghosh, Amlan, (2009) "Rural Life Insurance in Post Reform Era in India: Growth and Opportunities" International Journal of Rural Development and Management Studies Volume 3, Number 2.
- [4] <<http://www.irda.gov.in>>
- [5] <http://en.wikipedia.org/wiki/Micro_insurance>
- [6] <<http://www.microinsurancenet.org/history.php>>
- [7] <<http://www.adf.com/microinsurance>>
- [8] Roth, J. , Churchill, C., Ramm, Gabriele and Namerta, (2005) Micro insurance and Microfinance Institutions - Evidence from India; CGAP Working Group on Micro insurance, Good and Bad Practices, Case Study No. 15.

Impact of Entrepreneurial Characteristics on Organizational Performance: An Exploratory Study

Deepak Sharma¹, Dharmendra Kumar² and Gaurav Agrawal³

¹Asst. Prof., KC Institute of Management, Una

²Asst. Prof., Delhi College of Technology & Management, Palwal

³Asst. Prof., BSA College, Mathura

Abstract—Organizations are formed to achieve goal by efficient and effective use of resources. Effective and efficient use of resources ultimately determines the overall performance of the organization. In this way, performance of the organization depends on how the management of the organization drafting their strategies and implement practices for overall organization to handle the resources in effective and efficient manner. These practices are determined by the entrepreneurial characteristics. Entrepreneur to Entrepreneur, the characteristic vary and their practices also vary. It is therefore important to understand the relationships between the entrepreneurial characteristics and organizational performance. This paper will help to understand to what extent the entrepreneurial characteristic can go to determine the Organizational Performance.

Keywords: Entrepreneurship, Organisational Performance, Entrepreneurial Characteristics

INTRODUCTION

All developed and developing countries have recognized the importance of the development of Small and Medium Enterprises (SMEs), because, they play a significant role in economic development. SMEs perform as a useful vehicle for economic growth of countries, because they have the capacity to achieve rapid economic growth, while generating a considerable extent of employment opportunities (Reddy, 1991).

Development of SMEs is significant in the developing countries, which suffered from problems of unemployment, lack of investment, balance of payment, poverty etc. Because, growth of SME's provides solution for the complex economic problems of a country.

Small and Medium Enterprises are assumed to play a key role in social and economic development. Entrepreneurship is a decisive factor for any economy to attain its competitive and dynamic character. It is the driving force for the achievement of economic development and creation of jobs, contributing at the same time to personal development. It is important to encourage entrepreneurship because they are market oriented. Their outlook effectively solves many problems or "voids" in the community and market place, with optimal use of resources. They organize themselves effectively, they thrive at their work and their influence on employees results in productive and efficient working ventures. They build businesses creating wealth and developing themselves and others in their communities. Thus entrepreneurial action result in contributing towards the development of overall environment and society.

Entrepreneurship is a process undertaken by an entrepreneur to argument his business interests. It is an exercise involving innovation and creativity that will go towards establishing his/ her enterprise. Entrepreneurship is a composite skill, the resultant of a mix of many qualities and traits-these include tangible factors as imagination, readiness to take risks, ability to bring together and put to use other factors of production, capital, labour, and land as also intangible factors such as the ability to mobilize scientific and technological advances.

Organization performance today has assumed special significance, since it is a key to economic development. The objectives of industrial development, regional growth and employment generation depend upon Organization performance. Entrepreneurs are thus the seeds of industrial development. The fruits of industrial development are greater employment opportunities to employed youth, increase in percapita income, higher standard of living and increased individual saving, revenue to the government in the income tax, sales tax, export duties, import duties, and balanced regional development

The aim of this study is to evaluate the characteristics of the entrepreneurs and the extent of the success gained in the enterprise through the Organizational performance.

REVIEW OF LITERATURE

Entrepreneurship covers business activities including manufacturing, retailing and also service industries. The word "entrepreneurship" has entered the managerial vocabulary as the 1980s' equivalent of "Professionalism" the managerial buzzword of the 1970s. Many managers are trying to understand the concept of entrepreneurship, and their own organization can be made more "entrepreneurial".

The theory of entrepreneurship comes in many guises. Management scholars and economists have made the entrepreneur an innovator, a leader, a creator, a discoverer, an equilibrator, and more. In only a few of these theories, however, is entrepreneurship linked to asset ownership (Knight, 1921; Mises, 1949; Casson, 1982; Foss, 1993; Langlois and Cosgel, 1993; Foss and Klein, 2005).

Entrepreneurship plays an important role in the economic system, which determines the nature and scope of this field. Economic systems grow and take shape under the influence of political policy, economic policy, and the socio-cultural ideas of the people.

According to Cole (1942), production of goods and services is possible due to integration of various factors of production such as land, labour, capital, management and entrepreneurship. Entrepreneurship is the purposeful capacity of individual or a group of associated individuals, undertaken to initiate, maintain or organize of profit-oriented business unit for the production or distribution of economic goods and services.

According to McClelland (1961), entrepreneurship is a risk-taking, which is responsible for end results in the form of profit or loss. According to him, the function of an entrepreneur is to promote economic ventures and take decisions on vital issues concerning production, finance, personnel and marketing and bear the risk arising out of business operations in a company form organization, the entrepreneurs are the common funds of the company.

Higgins (1991) defined entrepreneurship is meant the function of seeing investment and production opportunity, organizing an enterprise to undertake a new production process, raising capital, hiring labour, arranging for the supply of new materials and selecting top managers for the day-to-day operation of the enterprise.

According to Drucker (1970) entrepreneurship is neither a science nor an art, it is a practice, it has a knowledge base; knowledge in entrepreneurship is a means to an end. Indeed, what constitutes knowledge in practice is largely defined by the ends, that is, by the practice.

ENTREPRENEUR

The concept of entrepreneur varies from country to country as well as from period to period and the level of economic development thoughts and perceptions. A review of research done in different disciplines over the year would improve our understanding of the concept of entrepreneur.

The English word entrepreneur is a derivative of the French verb *entreprendre* that means literally, to “undertake” the German equivalent, *unternehmer*, closely translates to owner-manager (Drucker, 1985).

In the late 17th century, the French economist Cantillon described the entrepreneur as a rational decision maker who assumed the risk and provided the management of the firm (Kilby, 1971). In the 18th century, Drucker (1985) pointed out from Say’s statement the entrepreneur as one who “shifts economic resources out of an area of lower and into an area of higher productivity and greater yield”.

Collins, Moore, and Unwalla (1964) defined the entrepreneur as “— a risk taker – a man who braves uncertainty, strikes out on his own, and through native wit, devotion to duty, and singleness of purpose, somehow creates business and industrial activity where none existed before”. In a 21st Century business context, and largely as lay people understand it, entrepreneur typically refers to “a person who undertakes or control a business or enterprise and bears the risk of profit or loss” (Brown, 1993), while the Macquarie Dictionary offers a definition of “one who organizes and enterprise, is involved with considerable risk” (Delbridge, Bernad, Blair, Peters and Bulter, 1991).

THE CHARACTERISTICS OF AN ENTREPRENEUR

The characteristics of an entrepreneur that contribute to success are the result of his achievement motivation. The characteristics of achievement motivated persons were identified by McClelland (1961). Successful entrepreneur must be a person with technical competence, initiative, good judgment, intelligence, leadership qualities, self-confidence, energy, attitude, creativeness, fairness, honesty, tactfulness and emotional stability.

Timmons (1994) analysis of more than 50 studies found a consensus around six general characteristics of entrepreneurs: (1) commitment and determinations; (2) leadership (3) opportunity obsession; (4) tolerance of risk, ambiguity and uncertainty; (5) creativity, self-reliance and ability to adapt; and (6) motivation to excel. A related stream of research examines how individual demographic and cultural backgrounds affect the chances that a person will become an entrepreneur and be successful at the task.

Hashim, Wafa, and Suliman (1999) have proven empirically that entrepreneurial characteristics of the owner / manager are closely related to the success of the firm.

ORGANIZATIONAL PERFORMANCE

Kiyonari, Nakamura, and Hirao (1971) stated Venture business is a new company that intensively invests its energy in research and Development or creative design development. According to this definition, it may be considered that a venture business has at least two distinguishing characteristics. One is that there must be an entrepreneur who positively undertakes a new enterprise in which a risk exists. The other is that this entrepreneur performs some type of innovation activity.

Birch (1987) suggested the positive link between economic development and entrepreneurship. In another study, the most important psychological factors for success were the energetic participation in the endeavor, self-confidence, desire for being one’s boss, achievement need, linking of work commonsense and tenacity (Hornaday and Bunker, 1970). These factors were judge by the entrepreneurs themselves.

The resulting strategies therefore are frequently an extrapolation of the personality of the entrepreneur and an image of his or her vision. In turn, those decisions are guided by many factors, such as the characteristics, values and

expectations of the individuals that make them; factors that may thus influence the performance of the business (Bamberger, 1983).

Sandberg and Hofer (1987) put forward a model, $NVP = f(E, IS, S)$, suggesting that new venture success is dependent on the characteristics of the entrepreneur (E); the structure of the industry involved (IS); and the strategy (S) of the venture involved. They have subsequently determined the role of entrepreneurs in new venture performance (NVP).

Herron (1990) found that 40% of NVP could be attributed to entrepreneurial skills, skill propensities, and the interactions with strategy and industry structure. Freeman (1996) emphasizes successful entrepreneurs are especially skilled at using their time to develop relationships with people, who are crucial to the success of their new venture. The characteristics of top management teams are important to the success of a new venture (Eisenhardt and Schoonhoven, 1990).

CHARACTERISTICS OF ENTREPRENEURS' AND ORGANIZATIONAL PERFORMANCE

Whilst several studies have focused upon the personality and traits of entrepreneurs, the performance of entrepreneurs has received limited research attention. Given the heterogeneous nature of entrepreneurship in terms of motivational diversity, different types of entrepreneurs and organizational forms, measuring entrepreneurial performance is inevitably a challenging task (Davidson, 1995).

Cooper (1998) suggested that the degree to which an entrepreneur was satisfied may influence future investment decisions in the business and Watson (2001) argued that, as many of the reasons given for entering a business are non-financial (Stanworth and Curran 1976; Cooper, 1993). Non-financial performance indicators (Such as owner satisfaction) should be included in any assessment of SME performance (Watson, 2001).

Heunks (1998) pointed out that innovation plays an important role in the success of small and medium-sized enterprises, and the individual characteristics of entrepreneurs such as values, posture, and education level etc may influence a company's innovation and originality.

Kiyonari, Nakamura, and Hirao (1971) conducted research about the relationship between the characteristics of founders and enterprise establishment on the basis of interviews of 80 people who founded venture businesses. Gartner (1985) proposed that the interaction of the entrepreneur's personality, the environment, and the characteristics of the organization, led to the process of entrepreneurship, including the venture creation and growth.

Freeman (1996) emphasizes that, as a result, successful entrepreneurs are especially skilled at using their time to develop relationships with people, who are crucial to the success of their new venture. Management characteristics, operating characteristics, and competitive strategy are the characteristics of the successful small manufacturing firms (Stainer and Soles, 1998). Another study has identified six principal factors (Efficient management, marketing strategy, customer orientation, supportive environment, capital accessibility, and product quality) that are perceived to be major contributors to the success or growth of manufacturing SMEs in India (Wijewardena and Zoysa, 1993).

Dess and Robinson (1984) reported strong and statistically significant relationships between the subjective comparative assessments of the 5-year performance of 18 businesses by their top management against other similar businesses in their industries, and the objective measures of return on assets and sales growth.

CONCLUSION

Cooper (1998) argues there is an empirical relationship between the business founding processes of entrepreneurs and the performance of their businesses. The result also supports Kotey's and Meredith's (1997) broad finding that the personal values of owner/managers, the strategies they adopt in operating their firms, and the performance outcomes of their businesses are empirically related. Based on the empirical research, the researcher found that positive relationship between entrepreneur characteristics on organizational performance.

REFERENCES

- [1] Bamberger, I., (1983), "Value systems, strategies and the performance of small and medium-sized firms", *European Small Business Journal*, Vol. 1, No. 4, pp 25-39.
- [2] Birch, D., (1987), "An analysis of small business size and rate of discontinuance", *Journal of Small Business Management*, Vol. 7, No. 4, pp 1-7.
- [3] Box, T., White, M.A. and Barr, S.H., (1993), "A contingency theory of new manufacturing firms performance", *Journal Entrepreneurship Theory and Practice*, pp 31-45.
- [4] Brown, L., (1993), "The new psychology of the entrepreneur, *Encyclopedia of entrepreneurship*," Englewood Cliffs, NJ, Prentice-Hall, pp 39-57.
- [5] Casson, Mark C., (1982), "The entrepreneur an economic theory, Oxford: Martin Robertson," 2nd (ed) Edward Elgar, *Advances in Economic strategy Research*, New York: Oxford University Press.
- [6] Cole, A.H., (1942), *Entrepreneurship as an area of research, the task of economics history*.
- [7] Cooper, A.C., and Dunkelberg, W. C., (1981), "A new look at business entry experiences of 1,805 entrepreneurs", *Frontiers of Entrepreneurship Research*, MA Babson, college, pp 1-20.
- [8] Cooper, A.C., (1998), "Findings on predictors of performance from a large-scale research program, small enterprise research", *The Journal of SEAANZ*, p 247.

Study of Growth in Micro and Small Scale Enterprise after Liberalization in U.P.

Priyanka Chaudhary

Lecturer, Advance Institute of Management, Ghaziabad

Abstract—This paper focused the role of strategic financial policies among formal and informal credit institution in determining the access of micro and small scale enterprise credit in Uttar Pradesh. The analysis of the research show that limited credit reflects lack of supply, resulting from the rationing behavior of both formal and informal financial institution. This research concludes by improving lending term and conditions in favour of small-scale enterprise would provide an important avenue for facilitating their access to credit and growth to analyze the factors that determine to participation of entrepreneurs in credit markets and their choice of credit source in Uttar Pradesh.

Keywords: SMEs, Financial Policies, U.P.

INTRODUCTION

We will focus on entrepreneurship development within the small and micro scale enterprise (SME) sector in India. The micro and small scale Enterprise sector has often been termed the 'engine of growth' for developing economies. We begin with an overview of this sector in India and look at some recent trends which highlight the development and significance of this sector vis-à-vis the Indian economy. The provision of credit has increasingly been regarded as an important tool for raising the incomes of semi-urban populations, mainly by mobilizing resources to more productive uses.

Commercial banks and other formal institution fail to cater for the credit needs of smallholders, however, mainly due to their lending terms and conditions. It is generally the rules and regulations of the formal financial institution that have credit the myth that the poor are not bankable, and since they can't afford the required collateral, they are not considered creditworthy. Hence despite efforts to overcome the widespread lack of financial services, especially among smallholders in India, and the expansion of credit in the semi-urban areas in the states of India, the majority still have only limited access to bank services to support their private initiatives. In Western Uttar Pradesh, despite emphasis on increasing the availability of credit to small and micro enterprises (SMEs), access to credit by such enterprises remains one of the major constraints they face.

Although informal credit institution have proved relatively successful in meeting the credit needs of small enterprises in some countries, their limited resources restrict the extent to which they can effectively and sustainably satisfy the credit needs of these entrepreneurs. This is because as micro enterprises expand in size, the characteristics of loans they require become increasingly difficult for formal credit sources to satisfy, yet they still remain too small for the formal lenders, studies on financial markets in Western Uttar Pradesh have shown that credit markets are segmented and unable to satisfy demand for credit in rural areas. A relevant issue for empirical investigation is therefore that of the factors behind the coexistence of formal and informal credit sources credit sources in the Western Uttar Pradesh market.

REVIEW OF LITERATURE

An increasingly body of analytical work has attempted to explain the functioning of credit markets using theoretical development. Challenging the paradigm of competitive equilibrium, they have explored the implication of incomplete markets and imperfect information for the function of credit markets in developing countries. The work by Stiglitz and Weiss (1981) marks the beginning of attempts at explanations of credit rationing in credit markets. The incentive effect occurs because as the interest rate and other terms of the contract change, the behavior of borrowers is likely to change since it affects the returns on their projects, Stiglitz and Weiss (1981) further show that higher interest rates induce firms to undertake projects with lower probability of success but higher payoffs when they succeed (lending to the problem of moral hazard). Besley (1994) analyses the rationale for interventions in rural credit markets in the presence of market failure. An increase in interest rates negatively affects the borrowers by reducing their incentive to take actions conducive to loan repayment. Accordingly, where the default risk exists, with the upward sloping supply curve and the borrowers are restricted to those points. Empirically, research on the use of credit by rural household tends to imply that although it is not obvious that demand for credit far outweighs the supply, there are significant obstacles to the transformation of potential demand into revealed demand (Aryeetey, 1996b). The absence of supply creates a lack of demand expressed in low revealed demand. Again, due to market failure in the credit market, the transaction cost involved in obtaining credit is considered greater than the utility, promoting households to switch profits between activities as a way of financing working capital. This also explains the existence of informal credit markets alongside formal credit institutions.

OBJECTIVES

The objectives of the Research were:

- To identify the main features of the lending policies of formal and informal credit institutions that determine the access to and use of credit by small-scale entrepreneurs.
- To analyze the factors that determines the participation of entrepreneurs in credit markets and their choice of credit source in Western Uttar Pradesh.
- To draw policy implications for financial services to small-scale enterprise in Western Uttar Pradesh.

20. Stochastic Liner Controlled Models <i>Puneet Sethi</i>	88
21. Impact of Information Technology on Business <i>Rakhi Garg</i>	90
22. Breadth First Search & Genetic Algorithm as an Effective Technique to Solve Crypt Arithmetic Problems <i>Anu Sharma, Nitin Kumar Verma and K.B. Anand</i>	95
23. Project Management Methodology Used for Process Improvement in IT <i>Nilesh Mahajan, Kirti Mahajan, Tusshar Mahajan and Sonia Gupta</i>	100
24. Interior Decoration through Creative use of Custom CAD Softwares <i>Bhawana Goel, Ramji Maurya and Kavita Bisht</i>	102

SESSION II

25. An Analysis of Delhi Local Transportation with Special Reference to Delhi Metro <i>Gurendra Nath Bhardwaj and Babita Pandey</i>	109
26. Poverty and Anti-Poverty Strategies in India <i>Minal</i>	115
27. Micro Insurance: A Tool for Socio-Economic Transformation <i>Vijay Kumar Gangal and Kirti Singh</i>	119
28. Impact of Entrepreneurial Characteristics on Organizational Performance: An Exploratory Study <i>Deepak Sharma, Dharmendra Kumar and Gaurav Agrawal</i>	125
29. Study of Growth in Micro and Small Scale Enterprise after Liberalization in U.P. <i>Priyanka Chaudhary</i>	128
30. Virtualization—The Game Changer in MSME <i>Paritosh Sharma and Shikha Dixit</i>	133
31. FDI in Retail...Prudence or Politics....??? <i>Rupesh Kr. Gupta and Neha Taak</i>	136
32. Economic Development in Rural Areas with the Help of Marketing at the Bottom of Pyramid with Special Reference to Indian Marketing Scenario <i>Ambarish Ghosh and Gaurav Takkar</i>	143
33. Inculcating Innovative Practices in an Organization in Competitive Environment <i>Bosky Agarwal, Nazia Hasan and Shalini Bansal</i>	148
34. Economic Liberalization and the Coffee Export Trade in India <i>Mili Saxena and Padmini Ravindra Nath</i>	152
35. Role of Marketing and Promotional Practices in Small and Medium Enterprises: With Special Reference to Moradabad and Nearby Region <i>Satyendra Arya, Avinash Rajkumar and Abhinav Srivastava</i>	156
36. Innovation—A Pillar for a Successful Entrepreneur <i>Roma Khanna, Surbhi Chauhan and Shachi Gupta</i>	165
37. Role and Importance of Small and Medium Scale Enterprise in Developing Nation <i>Paridhi Narang and Shipra Kaushik</i>	167
38. Poverty and Disability among Indian Elderly: Evidence from Household Survey <i>Vidushi Yadav</i>	171
39. Study of the Working Behaviour of Unorganized Service Sector in the Middle Size Towns with Special Reference to Jabalpur <i>Uma V.P. Shrivastava and Jeetendra N. Mulkikar</i>	174

HYPOTHESIS

The Research tested below hypothesis:

The differences in the lending terms and condition between formal and informal credit institutions significantly determine the access to and the choice of credit sources by small-scale enterprise in rural Western Uttar Pradesh.

Financial Structure in SME (Small-Scale and Micro Enterprises) Sector: Western Uttar Pradesh

A large part of financial transactions in Western Uttar Pradesh occur outside the formal financial system. Formal finance refers to all loans, transactions and deposit occurring the regulations of a central monetary. Literature on the theory of credit markets with incomplete markets and imperfect information is largely relevant to the functioning of informal markets. Informal finance has been defined to refer to all transactions, loans and deposits occurring the regulation of a central monetary authority, while the semiformal sector has the characteristics of both formal and informal sectors.

Informal Finance	Formal Finance
Unregulated MFIs	Commercial Banks
NGOs	State Dev Banks
Savings and Credit Associations	Postal Banks
Village Banks	Insurance Companies
Self Help Groups	Leasing Companies
Farmers' Organizations	Money Transfer Firms
Women's Associations	Apex Organizations
Indigenous Savings Clubs	Rural Banks
Deposit Collectors	Cooperative Banks
	Microfinance Banks
	Credit Unions
	Regulated MFIs
	Finance Companies

One of the major hurdles faced by small scale industry is fund management. The problems on account of impact of fund management can be presented:

The shortage of finance affects the ability of the small units severely. Every kind of problem, whether of raw material, power, transport or marketing faced by an entrepreneur in its ultimate analysis turns out to be a problem of finance? The small industry gets elbowed out by the large and medium scale industries in the procurement of bank finance and institutional credit. The crux of the problem is very often that of finance. Studies on informal finance in Western Uttar Pradesh show that they will do well so long as the level of economic activity demands increasing financial services for group that cannot be reached by the formal financial institution. The failure of many government-subsidized credit programmes to reach the targeted groups has prompted the emergence of alternative means of administering rural credit so as to reduce the access problem. Most services of informal finance are client oriented, thus reducing the transaction costs for customers, and making their services attractive despite the explicitly high interest rates.

RESEARCH METHODOLOGY

The research used mainly primary data from individual entrepreneurs receiving credit from both formal and informal credit institutions as well as those who did not. The formal financial institutions considered in this study were commercial banks, post office savings bank, non-bank financial institution, cooperative banks and developments financial institution, mainly. The informal financial institutions in this study consisted of rotating savings and credit associations, self help groups, relatives and friends, women's associations, Chit funds and NGOs. The primary data were collected by administering structured questionnaires to the sampled respondents.

The survey was carried out in the rural areas of five districts of Bulandshaher, Mathura, Firozabad, Saharanpur and Bijnor. Small-scale entrepreneur engaged in manufacturing, wholesale and retail trade and primary processing of agriculture products were selected as the units of study.

DESIGN OF SAMPLING

Systematic random sampling was then used to pick subsequent respondents. A sample size of 500 respondents was initially targeted. However, only 325 respondents were successfully interviewed, distributed as follows: Bulandshaher 160, Firozabad 65, Mathura 40, Saharanpur 30 and Bijnor 30.

ESTIMATION

The major characteristics of enterprises that are likely to determine their participation in credit markets, and which segments of the market they use. Such characteristics include: main occupation, household size, number of business

owners and employees, gender of the owner, business revenues, incomes, enterprise age and assets owned. These characteristics have been found to determine the decision to apply for credit at all, and whether to apply from either formal or informal lenders. However, their effects on the lenders' decision to ration applicants differ between the two market segments. Table 1 gives the distribution of the main occupation of the respondents.

Table 1: Distribution of Occupation

Occupation	No. of Respondents Engaged in Activity	Percentage
Selling metal product	129	39.7
Selling food product	103	31.7
Selling glass product	63	19.4
Farming	15	4.6
Selling agriculture product	09	2.8
Formal employment	06	1.8
Total	325	100

(Source: computed from the collected data)

We observe that more than 70 % of the respondents were involved in selling of manufacturing product. And other 30% respondents were involved in agriculture product. Almost 70% of the sample had no supplementary activity on top of their main occupation. These results indicate that most of the enterprises sampled were small entrepreneur mainly in manufacture product as opposed to those engaged in agriculture enterprise. Surveys of small and micro enterprises in Western Uttar Pradesh have shown that more than 50% of the enterprises are located in rural areas. Their activities are also dominated by commerce and trade, most of which are in retailing and vending of manufacture products. These surveys also found that up to 61% of the enterprises are involved in trade, with only 12% in services and 27% in manufacturing. This study therefore gives a representatives picture of microenterprises response to credit needs, and their use of various credit source in the state.

The difference between the amount applied for and amount received in both markets was tested for statistical significance. The results presented in Table 2. The extent of credit rationing in three segments of the informal markets was also tested.

Table 2: Segments of the Market

Market Type	Mean Amount Applied(Rs)	Mean Amount Received (Rs)	t Value	Significance
Formal	51,961	29,018	2.77	0.008
Family and friends	10,461	8,870	1.53	0.140
Group based	2,284	1,703	1.85	0.072
Commercial lenders	12,012	11,252	2.04	0.046

(Source: computed from the collected data)

The result show that the difference between the amount applied for and that received is statistically significant in both credit markets, suggesting the existence of credit rationing in both markets. However, in the informal market, the difference between amount applied for and amount received is only statistically among the group based lenders and the commercial lenders. Among family and friends, the difference are not statistically significant, suggesting less credit rationing in this market segment. The concern with loan repayment among the formal lenders is given more emphasis and determines the amount of credit actually disbursed to the borrower compared with the amount applied for. Among the informal lenders, the deviation between the amount applied for and that received is attributed to their limited resource base. The result is a credit gap capturing those borrowers who cannot get the type of credit they need from informal source, and yet do not qualify for credit from the formal source due to their lending terms and conditions. We, therefore, observe two types of credit rationing whereby those who are credit constrained are discouraged from seeking credit due to the lending terms and conditions, and loan quantity rationing whereby those who apply receive less than they applied for. The small number of respondents who use credit is attributed to lack of information about credit and lack of security. Hence markets information asymmetry and problems of contract enforcement result in loan rationing by the lenders and eventually the inability to satisfy the existing demand as implied by these result.

A comparison based on the heterogeneity of the informal market was made of the different credit categories between the different segments (Table 3). The amount differed significantly between the different market categories.

Table 3: Credit Categories

Credit Category	Family & Friends	Group Based	Mean Value (Rs) Commercial Lenders	F Statistic	Significance
Initial capital	3,681	5,600	1,518	12.386	0.0001
Operating capital	10,142	3,580	11,942	8.4291	0.0001
Past credit, amount applied for	10,461	2,284	23,012	8.4824	0.0001
Past credit, amount received for	8,870	1,703	11,252	6.4357	0.0001
Current credit, amount applied for	NA*	2,575	19,020	9.3884	0.0001
Current credit, amount received	NA*	2,452	16,983	8.1643	0.0001

*Means the market segment was not used. The difference therefore applies to group based and commercial lenders.

(Source: computed from collected data)

The table shows that even within the informal market, there are differences between the different segments in the amount of credit applied for and received, which may imply that the different informal market segments serve different borrower categories, depending on the amount of credit they can offer. Difference in loan characteristics represent different lender types since in the informal market, different lenders are able to offer different credit packages to meet the needs of their clients. Units of informal finance therefore vary mainly because they are purpose oriented and develop to meet the demand for specific financial services.

Table 4 shows the distribution of the use of different categories of informal credit sources for both initial and operating capital. The results indicate that own savings at home was the most common source of finance used for both initial and operating capital. For initial capital, this was followed by loans from parents and closed relatives and the sale of property, while for operating capital, sale of property, profits and supplier's credit were the next most common sources. Personal saving again appears to be the most used source in the in formal market.

Table 4: Distribution of the use of Credit

Sources of Capital	Initial Capital		Operating Capital	
	Number	Percentage	Number	Percentage
Own savings at home	141	49(42)	157	53(47)
Loan from societies	7	2(2)	16	5(5)
Loan from self help group	3	1(1)	1	.3(3)
Parents/ close relatives	77	27(23)	1	.3(3)
Supplier's credit	6	2(2)	34	11(10)
Sale of own property/ profits	40	14(12)	84	28(25)
Income from manufacturing	8	3(2)	4	1(1)
Gifts from parents	4	1(1)	0	0
Total	286	100(86)	297	100(89)

Note: figures in the bracket are percentage of the total sample.

(Source: computed from collected data)

We find that borrowing for family and social obligations were the most common reasons. When the informal market is fragmented into the three categories, we see that for initial and operating capital, own savings at home, friends and relatives provided more than 50% of the loans from the informal market. Surveys of rural finance in Western Uttar Pradesh suggest the enterprise would use self help group only as a last resort or in emergency.

Table 5: Sources of Credit

Source	Past Credit Use		Current Credit Use	
	Number	Percentage	Number	Percentage
Societies	43	34(26)	42	51(44)
Self help group	2	2(1)	1	1(1)
Friends and relatives	19	15(12)	8	10(8)
NGO	46	36(28)	13	16(14)
Supplier's credit	11	9(7)	13	16(14)
No idea about institution name	4	3(2)	4	5(4)
Missing	2	2(1)	1	1(1)
Total	127	100(77)	82	100(86)

Note: Figures in brackets are percentages of the total who had ever borrowed. Current credit use here refers only to those who succeeded and whose applications were still being processed.

(Source: computed from collected data)

We have seen that more enterprise used informal sources of credit than formal sources. Even within the informal market, the different segments display different degrees of accessibility. Most enterprises used personal savings and credit from relatives. The reasons given in this part of study for not using credit or choosing a specific source tend to confirm this difference in accessibility. Evidence of credit rationing was observed in both markets. However, within the informal market, family sources display no rationing, compared with the other categories. Self help groups were the least used, reflecting their relative inaccessibility. The results also show a fragmentation of the credit market not only between formal and informal credit sources, but also by the distinct characteristics of the clients served. This is reflected in the differences in the loan amounts from different sources. A study of SMEs engaged in manufacturing activities found that over 50% of the sample had access to commercial bank credit in the form of short-term loans and the number was increasing over time. Hence, whereas distinct segments of the formal and informal credit markets serve the credit needs of enterprises engaged in specific activities, at the general level, existing evidence suggests that formal financial institutions, including commercial banks, are more accessible to those enterprises engaged in manufacturing enterprises. The credit market in Western Uttar Pradesh therefore seems disaggregated into different segments, with each saving different types of borrowers.

CONCLUSION

The research had the object of assessing the role of the institutional lending policies of formal and informal credit institution in determining the access to and use of credit facilities by small-scale entrepreneurs in rural Western Uttar Pradesh. The results showed that most enterprises (51%) had not used credit before. Out of those who had, the majority (67%) had used informal sources. The major reasons for not seeking credit were lack of information about credit and lack of required security. The use of specific credit sources, either formal or informal, was justified as the only source available. When credit access is seen in terms of the rationing behavior of lenders, we find that 15% of the sample was credit constrained, although only 49 % had ever applied for credit. Evidence of credit rationing was observed in both markets, as indicated by the significant difference between amount applied for and amount received. Within the informal market, however, family sources display no rationing compared with the other market categories. A comparison of household and enterprise characteristics between those who had used credit and those who had not, as well as between those who used formal sources and those who used informal sources, showed that the differences were not significant in both cases. The result is, therefore, a credit gap capturing too big for the informal market, but not served by the formal market. In Western Uttar Pradesh different lenders are able to offer different packages in the credit market. Data from this study show that each single lender had a specific credit package offered to borrowers meeting specific conditions. This was particularly true for the group based credit programmes supported by NGOs. We can therefore argue that in the Western Uttar Pradesh credit market, the diversity in informal credit with respect to loan characteristics represents only the different lender types offering different types of loans. The result is that potential borrowers fail to seek credit from informal sources because they do not provide the required credit package.

REFERENCES

- [1] Brody, A., (2005), "Managing the Social Performance of Microfinance," ITDG Publishing, Money with a Mission, Volume-2.
- [2] Subrahmanya, B. M. H., (2009), "Small Industry And Globalization: Implications, Performance And Prospects", Readings in Indian Agriculture And Industry, (Editors)
- [3] Subrahmanya, B. M. H., (2002), "Small Scale Industry in Liberalization Era: Emerging Dimensions of Needs for Finance, in Financial Management in Small Enterprises" Edited by N Meenakshisundaram, Kanishka Publishers & Distributors, New Delhi.
- [4] Redfern, A., and Snedker, P., (2002), ILO, "Creating Market Opportunities for Small Enterprises: Experiences of the Fair Trade Movement"
- [5] Drake D., And Rhyne. E., (2002), "The Commercialization of Microfinance: Balancing Business and Development," Kumarian Press.
- [6] Hirschland, M., (2005), "Saving Service for the Poor," Kumarian Press.
- [7] Badrinath, R., (1998), "Benchmarking for Small Enterprises: The International Competitiveness" Gauge International Trade Forum; Vol-2.
- [8] Copestake, J., (2005), "Microfinance And Poverty Reduction," ITDG Publishing, Money with Mission Vol-1.
- [9] Daley, S., (2002), Pathways Out of Poverty: Innovations in Microfinance for the Poorest Families, Kumarian Press.
- [10] World Bank, (2008), Innovation Experiences in Access to Finance

Virtualization—The Game Changer in MSME

Paritosh Sharma¹ and Shikha Dixit²

¹Associate Professor, CMCA, TMU

²Lecturer, CMCA, TMU

Abstract—Every business is moving on high speed broad band high way. Technology is changing its shape with every coming day. We have moved from desk top PC to Laptops, from laptop to tablets and from basic telephones to mobile and from mobile to iPhone or smart phones, and so our business is changing their operating methods. Earlier MSME's business was operated manually but now the young generation businessmen are using tablets PCs and smart phones to manage their business. This technological shift has put the entire business on high speed corridor of information sharing. Instant information sharing has resulted into more business and more opportunities. But the secondary fact is that this IT revolution has increased the infrastructure cost of MSME. This paper is all about evaluation of low cost and reliable solution of IT infrastructure along with the future trends and their use in business execution.

Keywords: Information Technology, Cloud computing, MSME, Online Advertising

INTRODUCTION

Business is all about information sharing and effective utilization of that information that can transform to revenue generation and brand building. The relationship between the MSME and its buyer is equally important as the relationship between MSME and its supplier. The manual linkage normally creates huge communication gap. That results into disconnection and business opportunity loss. Moreover manual operations have their own limitation of storage and execution. Manually managed businesses can survive only with limited number of buyers, supplier and a small amount of information. But in the fast changing face of dynamic business and rapidly growing competition MSME's have to empower themselves with current high performance support system. This is the only reason why we cannot find any MSME not taking IT support in their business. MSMEs constitute a vibrant and dynamic sector of the Industrial economy of India. This sector has its contribution in the economic development of India in terms of production, creation of additional employment and spectacular performance in exports, year after year. The big corporate houses cannot survive without the support of the supply chain of these MSME's.

The Globalization and post-liberalization era has enhanced the opportunities and challenges for the Micro Small Medium size Enterprise (MSME) sector. With their dynamism, flexibility and innovative drive they are increasingly focusing on improved production methods, penetrative marketing strategies and management capabilities to sustain and strengthen their operations. They are thus poised for global partnership and to absorb latest technologies in diverse industrial fields. Many Information Technologies (IT) companies and IT enabled services providers are adding SMEs into their priority sales programmes. They are launching various solutions keeping in mind the specific requirements of the SMEs and their affordability. Enterprise Resource Planning (ERP) related solutions are being launched every day by many information or management solution providers.

Another technological advancement that is getting popularity is cloud computing. Cloud computing is Internet-based computing, whereby shared servers provide resources, software, and data to computers and other devices on demand, as with the electricity grid. Cloud computing is a natural evolution of the widespread adoption of virtualization, service-oriented architecture and utility computing. Details are abstracted from consumers, who no longer need to have expertise to operate or to control over, the technology infrastructure "in the cloud" that supports them.

MICRO, SMALL, MEDIUM SIZE, ENTERPRISE (MSME)

Micro Small Medium size Enterprises are the enterprises in which less capital is involved and which start with small numbers of people. These are generally privately owned corporations, partnerships and sole proprietorships. MSME's has its contribution in the economic growth of country. These enterprises provide more opportunities and employment in comparison of large organizations. These businesses can be started with low cost and on a part time basis. MSMEs are independent and freedom to operate independently is a reward for small business owners. In addition, many people desire to make their own decisions, take their own risks, and reap the rewards of their efforts. Small business owners have the satisfaction of making their own decisions within the constraints imposed by economic and other environmental factors. They are treating their customers as emperor and give them priority. The small business has small number of people therefore these businesses have more group cohesiveness than large organizations have. MSME proprietors tend to be intimate with their customers and clients which results in greater accountability and maturity.

VIRTUALIZATION

We people are living in the era of technology therefore one can't avoid its pace. Information technology is the major player in the growth of business and Indian economic sector. So in this technological era Indian small and medium businesses (SMBs) are planning IT initiatives to increase its growth and performance. Virtualization is at the top of the

list for many. It is no longer just an enterprise technology and is increasingly being adopted by SMB organizations. As we are aware about the fact that there are pros and cons of everything so as is technology. Although it has solved many problems and reduced human efforts but it imposed many challenges also. Security is one of them. Many cybercriminals are concealing the valuable data of various businesses and MSME's also have become favorite target of these cybercriminals. In Present scenario these small businesses will start taking tangible steps to protect their businesses from the threats they face.

The following are some of the key IT trends that will influence implementation of IT in the MSME:

USE OF CLOUD COMPUTING

Cloud computing is a emerging concept in today's time. It has captured the attention of organizations of all sizes. Cloud computing is a kind of technology that offers lower operational expenses, scalability and mobility among other benefits. In general terms, cloud computing can be described as a web architecture that allows users to work and save information online. The aim is to move all of the applications installed on our computers to a remote location. In other words, to do away with a number of standard components, including operating systems and hard disks, and make them accessible through an online desktop accessed via a standard browser. In cloud computing Instead of data being stored on the PC, it is stored on a server on the Internet. Cloud computing transforms computer processing, data storage, and software applications, allowing them to be delivered as a utility. Just like people tap into existing infrastructure for water or power, companies can now tap into a variety of services - applications, platforms, raw computing power and storage - all via the Internet.

MSME in particular, are increasingly aware of emerging technologies, as they struggle to secure their IT infrastructure and better manage their data and storage needs. According to the Symantec 2011 State of Cloud Survey, Indian organizations are conflicted about security – rating it both as a top goal and as a top concern with moving to the cloud. Eighty-seven percent of respondents are confident that moving to the cloud will not impact or will actually improve their security. Cloud security services such as email security and web filtering technology allows small businesses to get enterprise-class security as a service that is always up-to-date on the latest threats. Many organizations are talking about moving to the cloud. Most of the Indian organizations have adopted or are adopting some sort of cloud service for security.

CLOUD COMPUTING FOR SMES

The numbers of MSMEs are increasing day by day in India. MSMEs are planning to adopt cloud computing technology because of its ability to cut costs and reduce the need for capital equipment - both hardware and software. The adoption of cloud computing has certainly increased in India and is the fastest growing technology. Cloud computing is the next logical stage in the adoption of virtualization and the transformation of IT.

According to Cisco, cloud applications offer SMEs more than just peace of mind - they offer flexibility as well. This is a critical component of an overall growth strategy, as businesses often find themselves at a point where they need to spin up (or spin down) resources to match customer needs. MSMEs need a solution which doesn't require them to appoint or to consult a costly consultant. MSMEs implement those IT applications in their functioning which require less infrastructural cost. They can't spend too much IT infrastructure and professionals. They want something that can add value to their business at the same time when they started using of that application. Here cloud based applications can be very useful. In any cloud based set-up the applications can be used in almost in the same way as e-mail. They just need to sign-up, pay monthly fee, and use. It can be used with any PC, laptop or smart phone or any other application. This is the biggest advantage of cloud. Cloud makes easy life for SMEs.

The advantages of cloud computing are improved business agility, the convenience of self-service and reduced equipment costs, but they can only be reached with a comprehensive management strategy that reduces risk and drives compliance. Keeping in mind the increasing demand for cloud computing, especially in the SME sector, NetApp enhanced its cloud portfolio, by adding storage capability. Taking a step in the direction, the company entered into an agreement with Tata Communications to offer NetApp-based cloud service to the customer.

MSMEs are providing a base for large organizations. These organizations expect a positive growth in the SME market space by use of more and more IT applications. About ten per cent of its revenues come from this segment, and the company expects a quantum growth in coming years.

VIRTUALIZATION AND THE MSMEs

Now a days MSMEs have resorted to taking shortcuts to protect information in physical and virtual environments. It is very necessary to have a backup of the data and information in soft form on the network. As we know that our environment is uncertain in nature and uncertainty contains risk, therefore it is very necessary to insure the business and its information against any contingency.

Virtualization facilitates standardization on a single platform. A common software platform will protect physical and virtual machines together, enabling SMBs to centrally schedule backup jobs, manage recoveries, monitor the success and failure of backup jobs and provide a common console that IT managers can use to administer all backup jobs.

Virtualization enhances automation in its functioning and centralizes monitoring. The creation of a virtual machine can now occur as quickly as in a few minutes by an individual and their creation can even be automated through the use of scripting. Centralized reporting can monitor and report on the creation of these Virtual machines. This is the authentic source of protecting and recording the information. It has simplified approach of backup that can protect and restore the information within the virtual machine very quickly and easily. It considers data duplication solution to save space and time.

ONLINE ADVERTISING FOR MSME

Online advertising means to make aware the customers about your product with the help of internet on various portals. Online advertising is much cheaper, faster, and has wider coverage than traditional advertising. A recent study reveals that very few of Indian MSMEs with access to personal computers advertise online. It is shocking why the sector is so much unaware of the benefits of using online advertising. The reason behind this could be that most of the MSMEs are started by first generation entrepreneur that are not aware about information technology and online advertising and its benefit than that of traditional one. With the help of online advertising MSMEs can overcome the disadvantage of being small in size and reach the global market. Online advertising is essential for every modern day business to create greater acceptance, strengthen the brand, and gain market shares from competitors.

Apart from online advertising, Indian MSMEs need to go also for other Internet technology tools like electronic direct mail and digital newsletter. In addition, websites and online directory listings can help them a lot to pull prospective buyers with rational effort and cost. Every business should learn to effectively use the Internet and explore the benefits of online advertising.

ADVANTAGES OF VIRTUALIZATION FOR MSMEs

- One of the most important part of virtualization i.e. cloud computing is very easy to implement for SMEs because of its low barrier to entry. Risks are limited because contracts with service providers are generally covered by service level agreements. These contracts can be cancelled at any time.
- For the channel community this means only more opportunities, as the cloud will increase the penetrations of IT services in the country. The market opportunity will be huge and no single vendor would be able to address it. Channels can themselves look to become cloud computing service providers for SMB's and niche verticals partnering with ISV's who can then deliver specific applications on the cloud.
- The cloud technology has the potential of simplifying business processes for SMEs. Coupled with that, the technology adds value to software applications and lowers costs by moving the focus of IT applications outside the limits of traditional businesses.
- Cloud computing is expected to help SMEs offer more cost-effective services to their customers, improving efficiencies in the process.
- Virtualization brings advancement to the enterprise and makes it more dynamic to adopt the changes placed in environment. This enables organizations to get competitive edge over others and a systematic management of their information.

CONCLUSION

MSMEs are small businesses therefore their IT needs are less complex and they have fewer legacy applications. This sector has been the most aggressive segment to adopt cloud services. MSMEs are often willing to outsource the delivery and operation of IT to third parties, ensuring that they focus on running their businesses. Cloud computing technology is catching fast in MSMEs. This is helping the MSMEs is reducing their IT cost and helping them in avoiding risk.

REFERENCES

- [1] <http://www.smeworld.org/story/technology/cloud-computing-for-smes-2.php>
*Symantec 2011 State of Cloud Survey **Symantec 2011 Virtualization and Evolution to the Cloud Survey
- [2] <<http://itknowledgeexchange.techtarget.com/mainframe-blog/sun-cto-cloud-computing-is-like-the-mainframe/> dt 24.1.12>
- [3] <<http://dl.acm.org/citation.cfm?id=1496091.1496100&coll=&dl=ACM> dt 24.1.12>
- [4] <<http://www.cloudave.com/2425/recession-is-good-for-cloud-computing-microsoft-agrees/> dt 25.1.12>
- [5] <http://news.cnet.com/8301-13953_3-9977049-80.html dt 25.1.12>
- [6] <http://www.businessweek.com/technology/content/aug2008/1c2008083_619516.htm dt 25.1.12>

FDI in Retail...Prudence or Politics....???

Rupesh Kr. Gupta and Neha Taak

Asst. Prof., KC Group of Institutions

Abstract—The retail sector in India has a pretty unique structure. It started with rationing and grew through retail in textile and footwear. Today, India has 15 million-plus retailers who account for \$350-plus billion of annual sales. The retail space is dominated by the unorganized sector that contributes to 94 per cent of the sales. FDI in retail will have a far-reaching impact on various aspects of the economy. If rolled out in phases and with proper checks and balances, it will give a boost to the economy. Customers will get a wide assortment of quality goods at reasonable prices. They will be able to buy the best brands across various categories. The biggest argument against FDI is centered on its negative impact on small, unorganized retailers. We believe that the unique model of retail in the country will not only survive FDI but also prosper once it's allowed.

Also, the ingenuity of Indian entrepreneurs has no match. Big retailers will find it difficult to measure up to services like free home delivery, monthly khata and the personalized approach of kirana stores. Even 10 years after FDI is allowed, unorganized retail will dominate the Indian market with more than 85 per cent share.

Keywords: FDI, Multi-Brand Retail, Foreign Investment, Retail Sector.

INTRODUCTION

Retailing in India came with evolutionary patterns from Kirana store to Super market. The journey of retail started long back through the Kirana store in India. This is first effort by local shopkeeper. The shopping centre concept comes into the existence in year 1869, with Mumbai Crawford market and Kolkata's New Market in year 1874. The underground shopping complex Palika Bazaar in New Delhi was established in the late 1970s and mini malls on the Bangalore's Brigade Road come into existence in 1980s.

Government of India entered into the rural India by franchisees called Khadi Bhandar.

This is direct selling in its pristine form, where the actual producer/manufacturer/farmer sells directly to his customers, without any middlemen/distributors in the picture.

The local kirana stores, are usually around 500 to 800

sq ft in size. Omni-present, low-key outlets, they're run by owners/proprietors who know their business well and pass on the knowledge to the next generation. Value proposition is basically convenience. Their success in the respective localities is such that the existence of these stores has been used as an indicator of the real estate potential in that locality.

Mini-supermarkets are the 'evolved' kirana stores of 1,500 or even 2,000 sq ft. In my view, they are in in-betweens, in search of a true identity in the entire customer service proposition.

Knowing that they are bigger than the local stores, they tend to go for over-kill, offering just about everything in terms of product/price range, but unfortunately forget that they do not have the luxury of space to do so. Customers tend to get a slightly better spread in terms of product/brand availability in these outlets. This sector was un-organized in the initial stage, and after that it carried forward by the textiles industries through the dealer model. Now it is growing as supermarket and hypermarket. The main drivers of the retail evolution in India are buying behavior of the customer, increase in disposable income of middle class, infrastructure development and changing customer choice. The target segments of retailers are the younger middle class earners, which belong to more than 20% of total population.

The growth in retail sector also comes through innovative ideas. As retailers are providing the innovative buying options at different store like as cash & Carry, lowest price day (Sabse Sasta din) which help to increase the customer base. Initially organize retail was involve in the apparels and footwear. Now retail has included the food chains, book & CD store (landmark) and electronics (CROMA store a Tata retail chain). These all changes occurred at a passage of time so; it is an evolution rather than revolution.

Traditionally, retailing in India can be traced to the emergence of the Corner stores (Kirana) catering to the convenience of the consumers.

- Era of government support for rural retail: Indigenous franchise model of store chains run by Khadi & Village Industries Commission
- 1980s experienced slow change as India began to open up economy.
- Textile sector with companies like Bombay Dyeing, Raymond's, S Kumar's and Grasim, saw the emergence of retail chains
- Later, Titan successfully created an organized retailing concept and established a series of showrooms for its premium watches

- The latter half of the 1990s saw a fresh wave of entrants with a shift from Manufacturers to Pure Retailers. For e.g. Food World, Subhiksha and Nilgiris in food and FMCG; Planet M and Music World in music; Crossword and Fountainhead in books
- 1995 onwards saw an emergence of shopping centers, mainly in urban areas, with facilities like car parking targeted to provide a complete destination experience for all segments of society
- Emergence of hyper and super markets trying to provide customer with 3 V's-Value, Variety and Volume
- Expanding target consumer segment: The Sachet revolution - example of reaching to the bottom of the pyramid.
- At year end of 2000 the size of the Indian organized retail industry was estimated at Rs. 13,000 crore.

OVERVIEW OF INDIAN RETAIL SECTOR

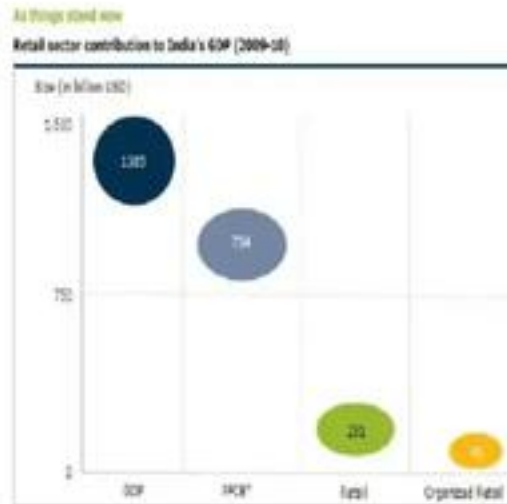


Fig. 1

Indian retailing is undergoing a process of evolution and is poised to undergo dramatic transformation. The retail sector employs over 8% of the national workforce but is characterized by a high degree of fragmentation with over 5 million outlets, 96% of whom are very small with an area of less than 50 m² (Aggarwal, 2000). The retail universe more than doubled between 1978 and 1996 and the number of outlets per 1000 people at an All India level, increased from 3.7 in 1978 to 5.6 in 1996. For the urban sector alone, the shop density increased from 4 per 1000 people in 1978 to 7.6 per 1000 people in 1996 (Venugopal, 2001). Because of their small size, Indian retailers have very little bargaining power with manufacturers and perform only a few of the flows in marketing channels unlike in the case of retailers in developed countries, (Sarma, 2000).

The corner grocer or the 'kirana' store is a key element in the retail in India due to the housewife's unwillingness to go long distances for purchasing daily needs. An empirical study was carried out by Sinha et al (2002) to identify factors that influenced consumers' choice of a store. Although convenience and merchandise were the two most important reasons for choosing a store, the choice criteria varied across product categories. Convenience was indicated by consumers as the most important reason in the choice of groceries and fruit outlets, chemists and lifestyle items while merchandise was indicated as the most important in durables, books and apparel.

The traditional formats like hawkers, grocers and paan shops co exist with modern formats like supermarkets, and non store retailing channels such as multi level marketing and teleshopping. Example of modern formats include department stores like Akbarallys, supermarkets like Food World, franchise stores like Van Heusen and Lee, discount stores like Subhiksha, shop-in-shops, factory outlets and service retailers (Nathan, 2001). Modern stores tend to be larger, carry more stock keeping units have a self service format and an experiential ambience. Modern formats also tend to have higher levels of sales per unit of space, stock turnover and gross margin but lower levels of net margin as compared to traditional formats (Radhakrishnan, 2003).

Modernisation in retail formats is likely to happen quicker in categories like Dry groceries, electronics, Mens' apparel, Books, Music. Some reshaping and adaptation may also happen in Fresh groceries, Women's apparel, fast food, and personal care products (Fernandes et al, 2000).

In recent years, there has been a slow spread of retail chains in some formats like supermarkets, department stores, malls and discount stores. Factors facilitating the spread of chains are the availability of quality products at lower prices, improved shopping standards, convenient shopping and display, and blending of shopping with entertainment, and the entry of industrial houses like Goenkas, Rahejas, Piramals and Tatas into retailing (Ramaswamy and Namakumari, 2002).

PRESENT SCENARIO

Retailing in India is witness to the boom in terms of modern retailing formats, shopping malls etc. the future of retailing for any product across the country will definitely be in malls where the consumer can get variety, quality and ambience.

However, in spite of this continuous debate to be or not to be, recently Government has allowed up to 51 percent FDI in single brand retailing by foreign companies like Reebok and Louis Vuiton. As of now, single brand retailers operate through the franchisee route and there is a strong view that FDI in this segment would not displace jobs or impact the local industry but help create employment.

Even today the government is undecided about the level FDI in retail, but a number of foreign players, including the Wal-mart stores, Inc., have announced their intention to enter India in a big way. At present Wal-mart is operating through its subsidiary in Bangalore, which was functioning as a liaison office till last year. Now it is in the process of setting up offices in New Delhi and Mumbai

FACTORS UNDERLYING EVOLUTION OF MODERN RETAIL IN INDIA

- Economic development
- Improvements in civic situation
- Changes in consumer needs, attitudes and behaviour
- Changes in government policies
- Increased investment in retailing
- Increase in power of organized retail

WHAT IS FDI?????

Foreign Direct Investment or FDI is any capital inflows from abroad that is invested in or to enhance the production capacity of the economy.

Recently the Government has taken a cabinet decision to allow FDI in multi-brand retail with foreign ownership upto 51% and raise the limit in single brand to 100%.

The decision also states:

1. Minimum amount of investment by a foreign retailer should be \$100 million.
2. At least 50% of the total FDI brought in shall be invested in "backend infrastructure".
3. At least 30% of the procurement of manufactured/processed products shall be sourced from 'small industries'.
4. Retail sales location may be set up only in cities having minimum 10 lakh population.
5. Government will have the first right to procurement of agricultural products

The decision has invited protests from the opposition parties and traditional forms of retailers demanding a roll back of the decision.

Presently, FDI is permitted in cash and carry (wholesale) with 100 % ownership and in single brand retail upto 51% ownership.

The unorganized form of retailing in India consists of 97% of the total retail market. It is the largest source of employment after agriculture and generates 10% of India's GDP.

Parliamentary standing committee in its 90th report on "foreign and domestic investment in retail, 2009 had stated its concerns about allowing FDI in retail:

1. The large cost effective retailers would displace the traditional kirana stores and render them unemployed. There are approx. 1.25crore Kirana shops employing 4 crore people. Together with their families 20 crore people depend on kirana shops.
2. The Indian retail market is still in the nascent stage to withstand competition from foreigners.
3. Also the foreigners due to bulk purchase would acquire monopolistic powers to reduce prices by the suppliers.
4. It would enter the market with exceptionally cheap prices and drive competition away. Then it would acquire monopoly over the prices.
5. It would lead to asymmetrical growth.

The Rationale Behind Allowing FDI in Multi-brand Retail

1. Developing retail infrastructure. Though FDI is allowed in single brand retail, the investment in infrastructure has been insignificant. Farmers in India incur loss of 1trillion out of which 57% is avoidable due to lack of storage facilities.
2. Indian farmers get only 1/3rd of the price paid by the consumers. The foreign retailers would buy goods directly from the farmers thus eliminating the intermediaries and give them remunerative prices for their supplies.
3. It would also provide the consumers with cheap goods due to economies of large scale and control consumer inflation.

40. Understanding the Requirement of Emotional Intelligence in the Organizations/ Workplaces: An Empirical Study <i>Vibhor Jain and Smrita Jain</i>	179
41. Small Scale Industry: A Vehicle for Economic Development and Employment Generation (A Study on Jharkhand State) <i>Saroj Ranjan</i>	182
42. Have EQ: Will Succeed <i>Shalini Aggarwal</i>	187
43. Impact of Creativity and Innovation on Organizational Effectiveness <i>Shipra Agarwal and Garima Rawat</i>	189
44. Road Transportation in India with Reference to National Highway <i>S.H. Indurwade and Sacheen S. Aloney</i>	192
45. The Role of Small and Medium Scale Enterprises in the Future of Emerging Economies (A Case Study of India) <i>Viksit Tripathi, Swastika Tripathi and Vaishali Singhal</i>	198
46. Restructuring the Rural Economic System—The Turnaround Phase of Regional Rural Banks <i>Megha Bhatia and Manjula Jain</i>	204
47. Impact of Globalization on Indian Rural Market <i>Madhulika Dutta and Manjula Jain</i>	209
48. Innovation and Creativity as a Key to Foster Sustainable Entrepreneurship: A Study in Delhi-NCR Region <i>Sanjeela Mathur and Aditi Midha</i>	213
49. Role of MSMEs (Micro Small & Medium Enterprises) in the Growth of Indian Economy <i>Jyoti Sharma</i>	221
50. Consolidated FDI Policy 2011: Level Playing Field for Domestic Participants and Foreign Players <i>Niti Saxena</i>	225
51. Perceived Impact of Science and Technology for Empowering Rural Women <i>Aditi Vishnoi, Vandana Verma and Sarita Verma</i>	228
52. Restructuring the Financial Institutions for Rural Development <i>Manoj Agarawl and Ashendra Kumar Saxena</i>	232
53. Information and Communication Technology and Women Empowerment <i>Vandana Verma and Ambuj Kumar Agarwal</i>	235
54. Creativity Innovation and Entrepreneurship <i>Shivani Gupta and Surendra Gupta</i>	238
55. Foreign Direct Investment in India with Reference to Manufacturing Industries <i>Sacheen S. Aloney and S.H. Indurwade</i>	241
56. यलरु-एतुलु; धदकेरु <i>मंजु वर्मा और राजीव वर्मा</i>	246

SESSION III

57. Consequences of Sudden Declines of Capital Flows: Evidence from India <i>Minakshi Paliwal and Sumanjeet</i>	251
58. Corporate Social Responsibility: The Key Role of Human Resource Management <i>Minal</i>	259
59. Corporate Social Responsibility—A Growing Conviction in India <i>Nabanita Baruah and Akanksha Singh</i>	263

4. The retailers in India would come out of their complacency and become competitive. They will have greater access to technology and improve their marketing interface to go global. The global food chains like KFC, pizza hut did not drive Nathus and Nirulas out of the market. Haldirams and Bikanerwala have gone global.
5. Real estate is also expected to get a boost.
6. It would provide employment to the people displaced and provide better remuneration. Govt. estimates nearly 10 million jobs in 3yrs.
7. It would also boost Government revenues.

The experience of countries like China, Thailand, Russia, Singapore, Malaysia etc. shows FDI is beneficial to the economy. Protestors of the reforms often say that even East India Company came to India as traders. Even China had permitted FDI in 1992. Has it been occupied by foreign powers?

Chegal Reddy, head of consortium of Indian farmers favours foreign investment in retail. The farmers in Punjab are very happy with the way things have shaped up for them post Bharti-Walmart. Farmers have a large lobby in India.

The FDI policy should be implemented in India with a proper regulatory framework. Also the Government should make it compulsory that atleast 50% of the jobs generated is for the rural youth. The Government should look at both sides of the coin before arriving at any decision.

The Big Question: Is FDI in Retail Really a Good Idea???

Given this backdrop, the recent clamour about opening up the retail sector to Foreign Direct Investment (FDI) becomes a very sensitive issue, with arguments to support both sides of the debate. It is widely acknowledged that FDI can have some positive results on the economy, triggering a series of reactions that in the long run can lead to greater efficiency and improvement of living standards, apart from greater integration into the global economy.

Supporters of FDI in retail trade talk of how ultimately the consumer is benefited by both price reductions and improved selection, brought about by the technology and know-how of foreign players in the market. This in turn can lead to greater output and domestic consumption.

But the most important factor against FDI driven “modern retailing” is that it is labour displacing to the extent that it can only expand by destroying the traditional retail sector. Till such time we are in a position to create jobs on a large scale in manufacturing, it would make eminent sense that any policy that results in the elimination of jobs in the unorganised retail sector should be kept on hold.

Though most of the high decibel arguments in favour of FDI in the retail sector are not without some merit, it is not fully applicable to the retailing sector in India, or at least, not yet. This is because the primary task of government in India is still to provide livelihoods and not create so called efficiencies of scale by creating redundancies. As per present regulations, no

FDI is permitted in retail trade in India. Allowing 49% or 26% FDI (which have been the proposed figures till date) will have immediate and dire consequences. Entry of foreign players now will most definitely disrupt the current balance of the economy; will render millions of small retailers jobless by closing the small slit of opportunity available to them.

Imagine if Wal-Mart, the world’s biggest retailer sets up operations in India at prime locations in the 35 large cities and towns that house more than 1 million people¹³. This means a foreign company will buy big from India and abroad and be able to sell low—severely undercutting the small retailers. Once a monopoly situation is created this will then turn into buying low and selling high.

As Nick Robbins wrote in the context of the East India Company, “By controlling both ends of the chain, the company could buy cheap and sell dear”.

It is easy to visualize from the discussion above, how the entry of just one big retailer is capable of destroying a whole local economy and send it hurtling down a spiral. One must also not forget how countries like China, Malaysia and Thailand, who opened their retail sector to FDI in the recent past, have been forced to enact new laws to check the prolific expansion of the new foreign malls and hypermarkets.

Given their outsourcing skills, resources and facilitation from the government, global players will be able to crush competition and charge monopolistic prices....

Praveen Khandelwal

General Secretary, Confederation of All India Traders

BUT, According to Rao (2001), **foreign direct investment** in the retail sector in India, although not yet permitted by government, is desirable, as it would improve productivity and increase competitiveness. New stores will introduce efficiency. Customers also gain as prices in the new stores tend to be lower. The consequences of modernization in India may be somewhat different due to lower purchasing power and the new stores may cater to only to branded products aimed at upper income segments. However it will be wise for old style stores to join together into wholesale and retail groups to improve bargaining power as experience in developed markets such as UK has shown that the modernization in retail has led to the decline of independent mom and pop stores.

The need for a **fresh perspective** while developing theories to explain the new developments has been stressed by Bennett et al (1998). The Indian retail environment is witnessing several changes on the demand side due to increased per capita income, changing lifestyle and increased product availability.

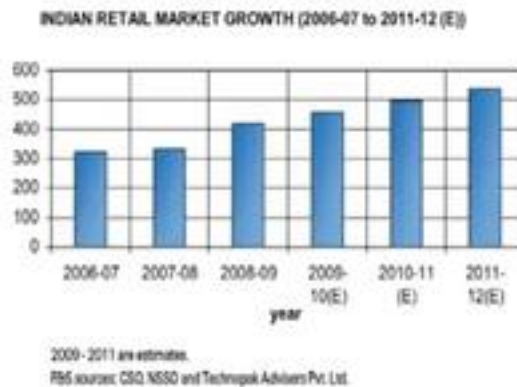


Fig. 1

RETAIL—AN IMPORTANT EMPLOYMENT GENERATOR

Since the retail revolution, the retail segment has churned out employment opportunities in India. The organized retail segment particularly has bettered job prospects for the younger generation. According to the survey results 84% of the employees were employed on a fulltime basis and the remaining on contract basis.

Educational qualification of employees in retail industry

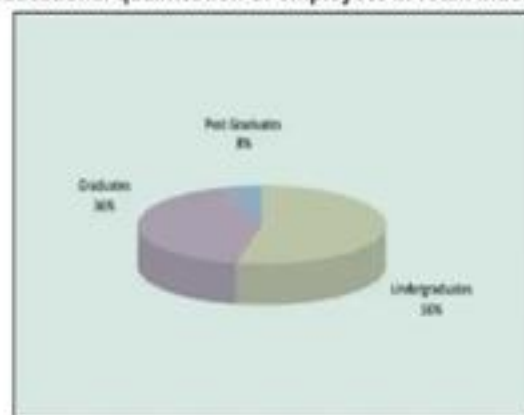


Fig. 2

Expansion Plans Continue Undeterred

The retailers in India are optimistic about growth of the industry in spite of global slowdown. A majority of the respondent companies (49.1%) feel that the industry will achieve an annual growth rate of 15-25% in the next two years while 36.1% companies feel that the industry will grow annually by 5-15% during the same period.

Factors that are playing a role in fuelling the bright future of the Indian Retail are as follows:

- The income of an average Indian is increasing and thus there is a proportional increase in the purchasing power.
- The infrastructure is improving greatly in all regions is benefiting the market.
- Indian economy and its policies are also becoming more and more liberal making way for a wide range of companies to enter Indian market.
- Indian population has learnt to become a good consumer and all national and international brands are benefiting with this new awareness.
- Another great factor is the internet revolution, which is allowing foreign brands to understand Indian consumers and influence them before entering the market. Due to the reach of media in the remotest of the markets, consumers are now aware of the global products and it helps brands to build themselves faster in a new region.

Currently India has one of the largest numbers of retail outlets in the world. According to a report by images Retail estimates nearly 715 malls will be added by 2015, with major retail developments in tier-II and tier-III cities fuelling further growth.

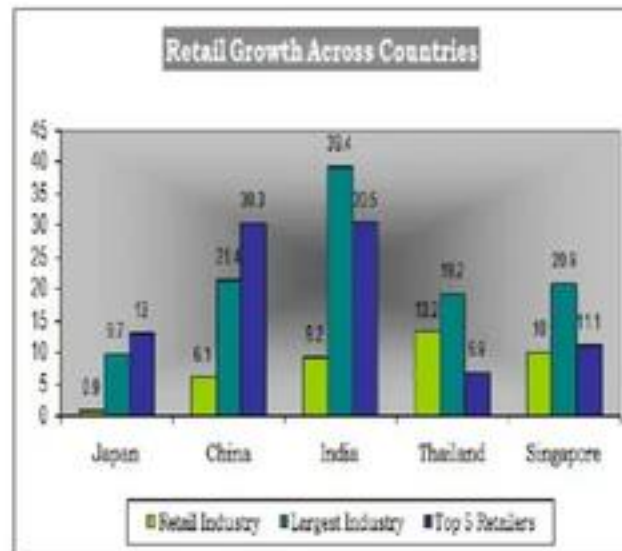


Fig. 3

Mumbai Emerges as the Preferred Location for Retailing

Among 24 popular locations for organized retail in India, Mumbai was found to be the most preferred location as 7% of the respondent companies reported to have retail stores/ outlets in Mumbai, and 6.5% respondents had stores/outlets in Bengaluru. Nonetheless, the northern region is also popular among these companies as 35.6% of the companies denoted their preference to have their retail stores in the northern region. This region has been riding high on the success of the IT and ITeS-BPO companies operating in the region, especially the NCR that has witnessed a spurt in the development of shopping malls, which appears as the primary reason for the region's increasing preference among retailers.

Table 1

S. No.	City	Region	% of Retail Outlet Centres
1	Mumbai	West	7.0
2	Bengaluru	South	6.5
3	Kolkata	East	5.9
4	Delhi	North	5.7
5	Hyderabad	South	5.7
6	Ahmadabad	West	5.4
7	Pune	West	5.3
8	Chennai	South	5.0
9	Noida	North	4.2
10	Gurgaon	North	4.0
11	Vadodara	West	4.0
12	Jaipur	North	4.0
13	Ludhiana	North	4.0
14	Lucknow	North	3.9
15	Chandigarh	North	3.7
16	Indore	North	3.5
17	Nagpur	West	3.2
18	Kochi	South	3.1
19	Nashik	West	3.0
20	Coimbatore	South	2.9
21	Bhopal	North	2.6
22	Goa	West	2.4
23	Managaluru	South	2.4
24	Bhubaneswar	East	2.4

- According to the study, two cities from the south feature among the top five locations—Bengaluru and Hyderabad
- On an overall basis, 29% of the respondent companies have presence in the western region and three cities from this region (Mumbai, Pune, and Ahmedabad) are among the top 10 preferred locations for organised retail in India, according to this study
- The top five cities as a combination—Mumbai, Bengaluru, Kolkata, Delhi and Hyderabad—were preferred by 31.8% of the respondent companies

Recent update.....

Govt to Notify 100% FDI in Single Brand Retail Soon

The government is soon expected to issue the notification allowing 100% foreign direct investment in single brand retail, Industry Secretary, PK Chaudhery said on Friday, January 06, 2012.

After years of delay due to political opposition, the cabinet on November 24 approved 51% foreign ownership in multi-brand retail, with conditions, and full ownership in single-brand retail.

However the government later suspended plans to open its USD 450 billion supermarket sector to foreign firms due to huge political opposition, backtracking from one of its boldest reforms in years.

CONCLUSION

Some Questions are Still Unanswered.....

Foreign direct investment (FDI) in the retail sector is currently a hot topic of debate. It is also a sensitive topic considering that the stakeholders in this case are consumers, local retailers and global retailers.

On one hand, it is argued that FDI should bring in investments in technology, infrastructure, cold storage facilities, distribution and manufacturing. If the top two retailers, who are already in India, commit to buy 5 per cent of their global purchases, this will translate into exports of \$25 billion! — a game-changer for the Indian economy.

But, the question that still lies is... Does the government has any plan to provide an alternative source of income to them and arrange for their rehabilitation? Prudence demands that the government should not disturb our traditional retail trade, which is running without causing any financial strain to the government.

So, it is suggested that an independent, in-depth study of the retail trade should be carried out by a task force comprising officials, experts and stakeholders to understand the ground realities of the retail trade. Efforts must be made to modernize and organize the existing retail trade instead of inviting MNCs to conquer the country once again.

Of course, collective well-being must be preferred over individual benefits.

REFERENCES

- [1] "A.T. Kearney Global Retail Development Index (2009)", AT Kearney.
- [2] <http://www.indiaretailing.com>.
- [3] "Indian retail market likely to touch \$720 bn by 2011 end", The Economic Times, Aug.
- [4] "Opening a Big Box: Organized Retail Confronts the Challenges of Local Markets", IndiaKnowledge@Wharton, March 20, 2008.
- [5] "Organizing for organized retail in India", Ernst & Young, 2009.
- [6] "Organized retail to grow from 5 pc to 14–18 pc by 2015", Outlookindia.com, Sept 28, 2008.
- [7] "Retail: Market and Opportunities", India Brand Equity Foundation 13, 2009.
- [8] www.thehindubusinessline.com.
- [9] www.researchandmarkets.com/reports/236028/indian_retail_industry_strategies_trends_and.pdf.

Economic Development in Rural Areas with the Help of Marketing at the Bottom of Pyramid with Special Reference to Indian Marketing Scenario

Ambarish Ghosh and Gaurav Takkar

Asst. Prof., NIMS University, Jaipur

Abstract— The bottom of the pyramid marketing is an important tool for the multinationals companies to cater the lower segments of the customers as they are playing a very important part in the growth of the companies. Many multinational companies now a days are moving forward to cater the base of the pyramid (BOP) means moving forward to make products according to the needs of the rural customers as they are having purchasing power but the issue is that how to reach them. As the rural customers are not well educated the main media to cater them is only the TV channels through which a company can have a reach to that kind of customers. This article is basically for the reason that how a company can make products according the needs and requirements of the rural or lower level of customers and what kind of products they can make for the rural or lower segment of customers. The study has critically analysed the issue and challenges involve in adopting base of pyramid (BOP) as marketing strategy. And has also successfully attempted to highlight growth perspective of the companies if they adopt the strategy. This paper provides indications and implications on future course of action that can be initiated by the companies.

Keywords: BOP, MNCs

INTRODUCTION

In economics, the **bottom of the pyramid** is the largest, but poorest socio-economic group. The phrase "bottom of the pyramid" is used in particular by people developing new models of doing business that deliberately target that demographic, often using new technology. This field is also often referred to as the "**Base of the Pyramid**" or just the "**BoP**". We should stop thinking of the poor as victims and instead start seeing them as resilient and creative entrepreneurs as well as value-demanding consumers. There are tremendous benefits to multi-national companies as well as local companies, who choose to serve these markets in ways responsive to their needs. After all the poor of today are the middle-class of tomorrow. There are also poverty reducing benefits if multi-nationals work with civil society organizations and local governments to create new local business models. We have identified the BoP Perspective as a unique market-based approach to poverty alleviation. The Bottom of the Pyramid (BoP) has emerged as one of the dominant ideas in business. We analyze how a large firm can serve low income customer profitably. Large corporations (MNCs) have only targeted customers at the upper end of the economic pyramid and have ignored BoP customers, assuming them to be inaccessible and unprofitable. To tap the vast markets at the BoP, MNCs must specially design and develop quality products and services, or they must select some to alter and make available at lower cost. Serving BoP customers is a profitable opportunity for corporations. It is also a social imperative, given that two-thirds of the human population (about four billion people) are at the bottom of the economic pyramid. I believe that we must help the poor to become selective consumers. I also suggest a framework to assess when it is appropriate for large corporations to participate in BoP markets.

OPPORTUNITY

The Indian rural market with its vast size and demand base offers a huge opportunity that companies cannot afford to ignore. We are a country with 1.12 billion people of which 70% live in rural areas which means more than 700 million people spread around 6,27,000 villages. India's rural population comprises of 12% of the world's population presenting a huge, untapped market. The importance of the rural market for some FMCG and durable marketers is underlined by the fact that the rural market accounts for 55 per cent of LIC policies, 70 per cent of toilet soaps, 50 per cent of TV, Fans, Bicycles, Tea, Wrist Watches, Washing soap, Blades, Salt, Tooth Powder and 38 per cent of all Two-Wheelers purchased. Of the two million plus BSNL connections, 50% is from small towns/villages and out of 20 million Rediffmail signups, 60% are from small towns. Let me also give you the gigantic market size of rural markets (in Indian Rupees) : FMCG - 6500 Billion, Agri-Inputs - 4500 Billion, Consumer Durable's - 500 Billion, Automobiles (2 & 4 Wheelers) - 800 Billion ! The figures tell us that the rural market is growing much faster than the urban counterpart. A recent forecast revealed that the Indian Cellular Services revenue will grow at a rate of 18.4 per cent with most of the growth coming from rural markets.

In 2010, the rural market has grown at an impressive rate of 25 per cent compared to the 7-10 per cent growth rate of the urban consumer retail market. According to a McKinsey survey conducted recently, rural India, with a population of 700 million, would become bigger than the total consumer market in countries such as South Korea or Canada and it would grow almost four times from its existing size in the next few years. The rural consumer is different from his urban counterpart in many ways. I think the biggest challenge for any MNC's are meeting the four aspects in rural marketing: Availability, Affordability, Acceptability & Awareness.

AVAILABILITY

The first challenge is to ensure availability of the product or service. India's 627,000 villages are spread over 3.2 million sq km; 700 million Indians live in rural areas, finding them is not easy. However, given the poor state of roads, it is an even greater challenge to regularly reach products to the villages. The first challenge is to ensure availability of the product or service. India's 627,000 villages are spread over 3.2 million sq km; 700 million Indians live in rural areas, finding them is not easy. However, given the poor state of roads, it is an even greater challenge to regularly reach products to the villages.

AFFORDABILITY

The second challenge is to ensure affordability of the product or service. With low disposable incomes, products need to be affordable to the rural consumer, most of whom are on daily wages. Some companies have addressed the affordability problem by introducing small unit packs. Godrej recently introduced three brands of Cinthol and Fair Glow in 50-gm packs, priced at Rs. 8-9 meant specifically for rural markets. The success of Cavin Kare has become a very notable case study. It is a company that began in a small way. It started the Chik shampoo sachet for 0.5 paise when shampoo was available at Re.1 or 2 and it revolutionized the market.

Hindustan Lever, among the first MNC's to realize the potential of India's rural market, has launched a variant of its largest selling soap brand, Lifebuoy at Rs.2 for 50 gm. Coca-Cola has addressed the affordability issue by introducing the returnable 200-ml glass bottle priced at Rs.5. The initiative has paid off: Eighty per cent of new drinkers for coke now come from the rural markets.

ACCEPTABILITY

The third challenge is to gain acceptability for the product or service. Therefore, there is a need to offer products that suit the rural market. One company which has reaped rich dividends by doing so is LG Electronics. It developed a customized TV for the rural market and was a runaway hit selling 100,000 sets in the very first year. Because of the lack of electricity and refrigerators in the rural areas, Coca-Cola provides low-cost ice boxes — a tin box for new outlets and thermocol box for seasonal outlets. The insurance companies that have tailor-made products for the rural market have performed well. HDFC Standard LIFE topped private insurers.

AWARENESS

Since large parts of rural India are inaccessible to conventional advertising media, building awareness is another challenge. Hindustan Lever relies heavily on its own company-organized media. Godrej Consumer Products, which is trying to push its soap brands into the interior areas, uses Radio to reach the local people in their language. Coca-Cola uses a combination of TV, Cinema and Radio to reach rural households. LG Electronics uses vans and road shows to reach rural customers. Philips India uses wall writing and Radio advertising to drive its growth in rural areas.

With all the above facts & figures the question is, can we afford to ignore rural India and move ahead? Well the answer is, we will not be able to survive without rural India in future! It is estimated that the rural India will consume 60% of the goods produced in the country.

For most of us, rural India is an unknown entity even today, and it calls for a lot of investment. Initially, the ratio between investment and returns will not be the same as we see in urban India. But eventually, we will get the returns. In today's corporate world, all the entrepreneurs and managers, looks for quick returns and depend on their quarterly results. They only look at what gives them immediate success. I think freebies have no meaning in rural India. Indian rural market is undoubtedly complex but there are some simple truths that we need to accept. The rural consumers are very value-conscious. They may be poor, but they are not backward and they can make a difference to our products and brands.

Gone were the days when a rural consumer had to go to a nearby town or city to buy a branded product. The growing power of the rural consumer is an opportunity for us to flock to the rural markets. At the same time, they also threw up major challenges. **Gandhiji** believed that **India's future lay in her villages** and it goes without saying those among us who can bring innovations in marketing mix with rural markets in mind will take away the "fortune at the bottom of the pyramid"

CLOSING THE GAPS IN THE BOP MODEL

Poverty can be eradicated through BOP initiatives. To eliminate poverty in just 15 years sounds like wishful thinking, will magically eradicate poverty. The main question is how we can help to eradicate poverty if the poor start buying products from big companies using the little money they have. This is the key issue: BoP consumers really cannot buy more than they currently do because they have so little disposable income. The objective is to reduce poverty and increase the income level of the poor, we should view them as producers, not as consumers. But to truly tackle their problems, we must consider how they function as consumers. That is, we need to facilitate production by the poor, and also support them in selective consumption. Selective consumption means choosing to enable or restrict consumption, based on the characteristics of the goods to be consumed and the effect they will have on the wellbeing of consumers. When marketers make such choices, they can have significant effects for the individuals involved. Developing the poor as producers is also important. It is worth considering the complex ways that the marketing activities of large corporations can affect the

quality of life for the BoP population. Disparities in income and differences in lifestyles can make the poor and underprivileged feel even more deprived by comparison. When companies intensively advertise and promote their products, BoP customers may aspire to buy products well beyond their basic needs, misplacing their priorities as they allocate their scarce resources. That is, they may spend their meager funds on fashionable products, or on the latest appliances or products that do not enhance their wellbeing; then they have less to spend on education, nutrition and health care. Influenced by an attractive advertising campaign, a rural woman may be induced to buy skin lightening cream or hair colorant instead of using that money to buy essential items such as vegetables or health care products. The problem with the consumer-focused BoP approach is that it does not differentiate between priority and non-priority areas. We should not assume, they say, "that the poor are too concerned with fulfilling their basic needs to 'waste' money on non-essential goods." However, marketing non-essential and luxury goods to BoP segment.

EXAMPLES

Micro-Credit

Example of "bottom of the pyramid" is the growing micro credit market in India. With technology being steadily cheaper and more ubiquitous, it is becoming economically efficient to "lend tiny amounts of money to people with even tinier assets.

Market-Specific Products

One of many examples of products that are designed with needs of the very poor in mind is that of a shampoo that works best with cold water and is sold in small packets to reduce barriers of upfront costs for the poor. Such a product is marketed by Hindustan Unilever.

Venture Capital

Whereas Prahalad originally focussed on corporations for developing BoP products and entering BoP markets, it is believed by many that SME might even play a bigger role. For LPs, this offers an opportunity to enter new venture capital markets. Although several social venture funds are already active, true VC funds are now emerging.

Fast-growing economies such as India, where the GDP per capita remains low.

THE BOP SUCCESS STORY

Hype and Sachets

Such as the use of small packages. Hindustan Unilever Limited (HUL), the Indian subsidiary of Unilever, which is "a pioneer among MNCs exploring markets at the bottom of the pyramid." They point to HUL as a successful example of how large corporations can profitably tap BOP markets, for products including candy, salt, and detergent also touted the case of Annapurna iodized salt, as another BOP success story for HUL. But national salt brands, including Annapurna, are beyond the reach of most poor consumers. In fact, most of the poor have been buying more affordable iodized salt brands produced by local companies. National brands like Annapurna cost about Rs 7-8 (17.5-20 cents) per kilogram compared to the Rs2-3 (5-7.5 cents) for local brands. In 2002, national brands had a 45 percent share of the overall iodized branded salt market while local brands held the remaining 55 percent share (The Hindu Business Line, 2002). Also, Tata Salt, not Annapurna, is the leader in the national branded salt market in India. No wonder then, that R. Gopala Krishnan (2004), the former vice president of HUL said that Prahalad's "illustration of Annapurna salt as co-creating a market around the needs of the poor" was "misplaced"; in fact, he said, "Annapurna salt has not co-created anything."

HUL's Project Shakti, a sales and distribution initiative that started to increase product penetration into rural markets. According to the company, this initiative aims "to empower underprivileged rural women by providing income-generating opportunities." As part of this project the company selects a woman as a Shakti entrepreneur (Shakti Amma) from a self-help group (SHG) set up by an NGO or government body. The company's rural distributor supplies the stocks to this woman who in turn sells the products to consumers as well as to retail outlets in the village. BOP proponents mention sachets (small packets) as an innovation that has delivered many products to BOP customers. If BOP customers "don't have lump sums to buy 20 ounces of shampoo at one time," a company should "do what Unilever did in India: Sell single servings of shampoo so the cost structure matches what they can afford" (Fast Company, 2005, p.25). In fact, sachets were introduced in 1976, not by HUL but by CavinKare, a local South-India based company, with its 'Velvet' brand (Ranganathan, 2003). In 1999, CavinKare came up with another pricing innovation: it launched a 4-mlsachet of Chik shampoo priced at 50 paise (1.25 cents). The launch was a great success: Chik's market share jumped from 5.61 percent in 1999 to over 23 percent in 2003. It became the largest selling brand in rural markets. As Chik's volume and market share grew rapidly, HUL saw the potential of the market it had always ignored—as well as its own vulnerability. It responded by launching 50-paise and one-rupee sachets of its Lux, Clinic Plus and Sunsilk brands. HUL had always viewed rural consumers as a low margin, inaccessible segment. It entered the BOP market for shampoo primarily because of its potential vulnerability, not as part of a planned strategy to serve poor customers. Considering all these cases, then, it

is simply incorrect to give HUL the status of a pioneer in tapping BOP markets, as the literature on BOP does. Small Isn't Always Beautiful BOP proponents view sachets and other small packages as an ideal way to tap low-income markets. Prahalad (2005, p.16) argues that because small packages are more affordable, they encourage consumption and provide a choice for the poor. But the empirical evidence does not support his contention. An ACNielsen study on rural markets in India revealed that, for several products, the best-selling package size is the same across rural and urban areas.

For products like: biscuits, jam, washing powder, sanitary napkins, and milk powder, the smallest available packages are not the largest contributors to the total volumes of products sold in rural areas. But in the cases of jam and milk powder, larger packages (e.g. 500 g) are better sellers even though smaller packages are available (e.g., 12 g in jam and 3 g in milk powder). The people who look for single-serve packaging is the most popular for most products in rural markets. The smaller packages of shampoo and razor blades also perform better in urban markets as well as rural ones. For shampoo this is probably true because shampoo sachets offer better value than larger packages. With sachets, consumers pay lower prices per unit 2 rs per sachet volume. For example, Sunsilk Black shampoo in sachets costs approximately 25 paise per ml. On the other hand, shampoo in a bottle costs approximately 5 paise. The artificial price differential actually contributes greatly to the popularity of shampoo sachets. Another study in India, by LG Healthcare, questions whether sachets are valuable for marketers: although they have helped increase penetration, they have also led to a decrease in overall consumption. For most products, the logic of serving the poor by simply offering smaller packages may not be as workable. To make small packs more affordable, companies must keep their unit cost lower compared to larger packs.

Aravind Eye Hospital (AEH) as an organization serving poor patients among the BOP population in India. Several facilitating factors helped AEH make its business model sustainable. First, AEH draws its patients to the hospitals from eye camps, which are organized by local business units, wealthy individuals, or social service organizations such as the Lions Club, Rotary Club and Vivekananda Kendra. These organizations bear the publicity costs and other costs incurred in organizing the eye camps, such as patient transportation, food and ophthalmic glasses. These organizations also pay for expenses related to transportation and meals for the patients selected for surgery. In total, these costs are estimated to be about Rs 200 (\$5) more per patient than a decade ago. In addition, AEH pays only for the cost of surgery and medicine. AEH was supported by the SEVA Foundation, Sight Savers International, Canadian International Development Agency (CIDA) and other organizations in setting up Aurolab, which manufactures intra-ocular lenses (IOL), sutures and other products used in eye surgery (Prahalad 2005). Through Aurolab, AEH gets supplies of IOL lenses and other Research and Publications products at a substantial discount. In addition, it is somewhat surprising to find AEH being discussed as a BOP success story, because the BOP approach calls on MNCs and the private sector to participate in low-income markets. As not-for-profit organization, AEH is in a different category. Another facilitating factor for many organizations serving the poor is a body of employees dedicated to a cause and ready to work for lower-than-market pay. For example, doctors and hospital staff at AEH are extremely dedicated to the cause, hardworking, and productive—and they work for far less than they would get in most private hospitals in India. Several other facilitating factors that enable organizations to serve BOP customers, including government subsidies, reduced taxes, and access to technological know-how developed at government-funded laboratories at low or no cost. For example, the massive campaign to encourage people to use iodized salt was initiated by government agencies, with support from NGOs and other social institutions. This in turn helped HUL to sell its Annapurna iodized salt in India. OLD WINE IN NEW BOTTLES

In this paper we have narrated the private sector can exploit profitable opportunities by tapping BOP markets, he gives the impression that this is a revolutionary idea. But companies have been selling to the BOP in one form or another for several decades.

Microfinance is useful for tapping the BOP market; it seems to be a new model for serving the poor. But microfinance has long been recognized as an efficient way to eradicate poverty. Landmark innovation, attracted worldwide attention many years before the BOP concept came to light. Less famous but larger is Bank Rakyat Indonesia, which has the world's largest sustainable micro-banking system and has held a dominant position in commercial microfinance in India for more than 20 years.

Organizations such as Amul, the State Bank of India, and Nirma have long realized the importance of serving BOP customers. The State Bank of India (SBI), a public sector bank, has been providing banking services for two centuries, and has more than 10,000 branches all over the country. It has been serving rural poor customers by providing bank loans for agriculture and other purposes and offering personal banking products. The sheer size of its network of branches helped it reach out to rural customers. In addition to SBI, other national banks and rural cooperative banks have been serving rural and BOP customers, with services designed specifically for them. At some banks, a villager can open an account with as little as Rs 500, whereas MNC banks may require a minimum balance of Rs 5000 (\$125) or more, well beyond the capacity of most BOP customers.

INCLUSION DECISIONS

If they use too much, or inappropriate, advertising and other forms of sales promotion, especially to the poor, that can lead the poor to allocate their scarce financial resources to imitative consumption. The eChoupal case is one example of

undesirable inclusion of the poor as a target market. In fact, eChoupal initiative of ITC, an Indian private sector company, has been prominently discussed in the BOP literature as a good example of a large company serving rural customers. The eChoupals aim to help farmers by providing them real time information about price and market demand of their farm produce and also by reducing the market intermediaries. As a model, eChoupal can provide certain benefits to farmers, such as better prices for their farm produce, but ITC is now selling its cigarettes to farmers at Choupal Saagar (rural malls), which were opened as extensions of eChoupal. Since conventional distribution channels are severely limited in their ability to penetrate rural markets, eChoupal is serving as a new distribution channel, increasing the reach of ITC's tobacco products in rural areas. Research has shown that people who are poor, less educated and underprivileged consume significantly more tobacco (Rani, Bonu, Jha, Nguyen and Jamjoum, 2003). The eChoupal initiative should be seen in the overall context of ITC's attempt to refurbish its image, reducing its business risk by diversifying into other products and using eChoupals as a distribution channel for its various products including cigarettes. Some commentators have already expressed their concerns. For example, in 2004, an Economist writer said that the chairman of ITC was "trying to embellish ITC's tobacco-stained image," or perhaps it was looking "to diversify away from a product always at risk of government action.

CONCLUSION

Every person to have access to the benefits of the global economy and every person as a consumer afford world class products and services. And every person as a producer have access to all kind of market whether it is a market of high level customer or base of marketing customer. Creating buying power, shaping aspirations, improving access and tailoring local solutions- the four elements of the commercial infrastructure for the bottom of the pyramid are intertwined. Corporations are only one of the actor; MNCs must work together with NGO, local and state governments and communities. Yet some one must take the lead to make this revolution happen. The questions are why should it be MNCs? Even if multinational managers are emotionally persuaded, it is not obvious that large corporations have real advantages over small, local organizations. MNCs may never be able to beat the cost of responsiveness of village entrepreneurs. Indeed, empowering local entrepreneurs and enterprises is key to developing Tier 4 markets. This study has strengthened the argument that Indian Market can earn a lot by targeting the BOP as cited in examples. The result clearly indicates the company who targets BOP are significantly more profitable than other.

REFERENCES

- [1] Gunther, M., (2006), "Chasing the base of the pyramid" Fortune, November.
- [2] <<http://money.cnn.com/2006/11/14/magazines/fortune/guntherkenya.fortune/index.htm>>
- [3] Microcredit in India: Helping Themselves in The Economist, August 11, 2005.
- [4] <http://en.wikipedia.org/wiki/Bottom_of_the_pyramid>
- [5] Ahmad, P. S. and J. Mead, (2004), "Hindustan Lever Limited (HLL) and Project Sting," Darden Business Publishing.
- [6] "Global, Consumer and Managerial Issues," Proceedings of the International Conference on Marketing and Development, Ball State University, Indiana.
- [7] Business India (2003). "Can MNCs Build Brands?" June 22.
- [8] Business Standard (2011). "Hind Lever Unilever recasts its foods business," February 12.
- [9] "The New Rural Consumer," Business Today, January 30, 2011
- [10] Hindustan Unilever (2008). "SHAKTI - Changing Lives in Rural India," retrieved April 7, 2008, from <http://www.hll.com/citizen_lever/project_shakti.asp>
- [11] Karnani, Aneel (2007). "Fortune at the Bottom of the Pyramid: A Mirage - How the Private Sector Can Help Alleviate Poverty," Working Paper, Stephen M. Ross School of Business, University of Michigan, April. As The Economist reported on August 11, 2011.

Inculcating Innovative Practices in an Organization in Competitive Environment

Bosky Agarwal¹, Nazia Hasan² and Shalini Bansal³

¹Lecturer, CMCA, TMU

³Account Head, CMCA, TMU

Abstract—Innovation is not a one day thing. It requires continuous or emergent or radical and revolutionary changes in the process of thinking, products, processes, or organizations. It considers the users' desirability, viability in the market, possible technology that can be used and its effect on the mankind. It is exploring a new method or process to accomplish a desirable task and to create new dimensions of performance. The goal of innovation is positive change, to make someone or something better. Innovation leading to increased productivity is the fundamental source of increasing wealth in an economy. In this paper we will be discussing the importance of various driving forces in an organization which will make it to stand apart from their competitors in global market place. Innovation can drive any business, in any industry to new position.

Keywords: Innovation, Competitive Environment, Creativity, Tools, Technologies

INTRODUCTION

Every successful organization began as a nimble, innovative startup with the ability to course-correct and quickly adapt to the needs of its customers. But along the way, success and growth cause changes in the structure, the culture, and sometimes even the vision of organizations. Successful, growing organizations often focus on driving out the operational inefficiencies they maintained during their startup phase, and unintentionally erect barriers to innovation along the way.

When organizations realize that they need to innovate, they find that they struggle to do so. Often organizations make the mistake of copying the artifacts they observe or read about in case studies to boost their innovation. Instead, organizations need to look internally to build new organizational capabilities that will enable them to create their own artifacts. Innovation is not only breakthrough in products or services but breakthrough in business model as well. Innovation can be achieved by capturing value by creating new opportunities, new approaches to implementation and new ways of going to market.

Innovation is something more than creative ideas. *Innovation is like a management process that requires specific tools, rules, and discipline.* From this point of view emphasis is moved from the introduction of specific novel and useful ideas to the general organizational processes and procedures for generating, considering, and acting on such insights leading to significant organizational improvements in terms of improved or new business products, services, or internal processes. Through these varieties of viewpoints, creativity is typically seen as the basis for innovation, and innovation as the successful implementation of creative ideas within an organization.

Innovation is one of the most critical capabilities that successful organizations possess. It stems from creativity and is often defined by the benefits that it produces. In the arts, it is what makes a work unique. In education it encourages student participation, interest, and concept retention. In business, innovation is responsible for the development of new products and services, winning marketing communications programs, reengineered business processes, and successful business strategies.

While one's innovative abilities are partially genetic, the expression of creative talent is dependent on several cultural aspects of the work environment that either stimulate or suppress innovative thinking.

Stages in Innovation

Most organizations fail to sustain growth over the long term because they are not able to innovate on a systematic basis. Companies focus on doing better or more (of the same) things, when they should rather focus on doing different things.

Think Beyond the Common Perspective

Start thinking by exposing the rules and behaviors inside the organization that might be hindering innovation in the first place. Often times more important than getting answers is asking the right questions. Keep in mind that outlining the "declared norms", the ones that will be found in the mission statement and other official documents aiming to guide employee's behavior, is not enough.

Perform Off-beat Tasks

The second step is to challenge the outlined assumptions. By asking "what if we decided to do the complete opposite?" If company has traditionally focused on only on cash payment now "what if we start focusing on different modes of payments?".

60. Corporate Social Responsibilities—Recent Activity by TATA Group <i>Abhinna Srivastava and Shiddharth Kumar Rai</i>	266
61. Behavioral Finance as an Analysis and Interpretation of Trading Behavior and Returns <i>Gaurav Bansal and Neeraj Sanghi</i>	270
62. A Functional Analysis of Integrated Risk Management <i>Gaurav Bansal and Neeraj Sanghi</i>	276
63. Globalization and Corporate Social Responsibility <i>Parul Jain, N.C. Pahariya and Madhuram kulshrestha</i>	282
64. Trends in Regulations on Employment Termination Issues: A Study on Contemporary Practices <i>Indranil Bose and R.K. Mudgal</i>	286
65. Fulfilling Product and Brand Promises through Innovation <i>Brajesh Kumar and Sandeep Kumar Mishra</i>	290
66. Corporate Social Responsibility in Rural Development Sector: Efforts of HINDALCO Industries Limited <i>Shishir Pandey and Praveen Kumar Singh</i>	295
67. Global Convergence of Accounting Standards: An Emerging Paradigm <i>Mohd Anam Akhtar, Ravindra tripathi and Khurram Ajaz Khan</i>	299
68. RTI—The Harbinger of a Silent Revolution <i>Yogendra Pal Bharadwaj and Parvez Alam</i>	304
69. Corporate Social Responsibility Creates Value for Shareholders <i>Satish Chander Jain</i>	309
70. Accounting for Carbon Credits <i>Mukta Jain</i>	315
71. Insider Trading <i>Amit Kumar Goel and Fawad Ali Khan</i>	319
72. Succession Planning: Identifying and Nurturing Future Leaders <i>Orooj Siddiqui, Fawad Ali Khan and Abdul Tayyab Khan</i>	324
73. Corporate Social Responsibility—Towards Stakeholders <i>Satish C. Sharma and Preeti Goswami</i>	329
74. Corporate Social Responsibility and its Strategic Utility <i>Garima</i>	335
75. Banking Sector Reforms in the Past Decade: Indian Experience <i>Jyoti Paul</i>	339
76. Theory of Survival of the Fittest—A Prospective from Corporate Culture <i>A. Lakshmana Rao</i>	344
77. RTI Revolution: A Yes Button to Unveil Information <i>Shivangi Singhal</i>	350
78. Resurging India—The Real Picture <i>Seema Batra</i>	354

SESSION IV

79. Myths & Realities on Warehousing Management System (WMS) <i>Suruchi Panday</i>	359
80. A High Precision Low Power Dynamic Comparator for High Resolution Pipeline ADCs <i>Deepchand Jaiswal</i>	363
81. An Algorithm for Task Assignment in Distributed Network using Static Approach <i>Kapil Govil</i>	367

Welcome Failures

Do not stop by a failure. Try to accept failures if want to innovate and consequently to succeed. It does not mean you should pursue failure for the sake of failing but rather because you can learn from failures and because it will spark new ideas. When a company fails it is necessarily trying new things, new concepts. It is stretching itself beyond the comfort zone.

Use as Many as Sources of Innovation

Innovation process is to only restrict to top management but rather it can involve anyone working for the organization. Innovation can emerge from employees, partners, suppliers, customers and so on. So make sure not to neglect any of them.

Go Beyond Product Innovation

Over the last decade companies and managers have paid too much attention to product innovation.. Instead of focusing exclusively on product innovation companies should think how they can innovate their processes, their structure, their business model and even their market.

Analyze Both Threats as Well as Opportunities

Some companies spot market or technological changes exclusively as threats. They end up taking defensive actions to protect their segment, not figuring out that maybe that segment will not exist at all in the near future.

Execute

Good ideas come from acting and not from thinking. Many people sit in front of the drawing table and try to come up with the so called "killer application" or the "next big thing". This is a plain waste of time. Strategic planning is essential, but most people are able to carry it out.

GOALS OF INNOVATION

Programs of organizational innovation are typically tightly linked to organizational goals and objectives, to the business plan, and to market competitive positioning. One driver for innovation programs in corporations is to achieve growth objectives.

In general, business organisations spend a significant amount of their turnover on innovation, such as making changes to their established products, processes and services. The amount of investment can vary from as low as a half a percent of turnover for organisations with a low rate of change. The investment may vary by industry and by market positioning. Innovation is required to:

1. Improved quality
2. Creation of new markets
3. Extension of the product range
4. Reduced labour costs
5. Improved production processes
6. Reduced materials
7. Reduced environmental damage
8. Replacement of products/services
9. Reduced energy consumption
10. Conformance to regulations

MAIN AREAS THAT CAN BE BENEFITTED

There are unforeseen outcomes produced by innovation but the four main areas of benefit of innovation are :

1. Customers: Customer is the ultimate user of the product, so a creative approach should be applied. Customers are benefitted by the new innovative products, the innovative way of marketing, selling, payments.
2. Suppliers: Suppliers use innovative techniques to supply raw materials to the customers. Innovative ways of services can used to stand apart from other suppliers.
3. Employees: Employees are now involved throughout the organization processes and can help in building a culture of innovation. Business is now considered as an "innovation team". People from different parts of the company and with different job functions can work together as a team for purposes of generating innovations. Everyone has creative ideas, so everyone should be involved in the process of generating innovations. By involving people in different parts of the company, you benefit from the different perspectives and experiences each individual brings to the creative process. Worker safety has improved substantially.
4. Shareholders : If organization has something new to offer, then it will be attracting more demand. If demand increases all people concerned will be benefitted.

WAYS TO BE INNOVATIVE

Innovation has been identified as the last competitive advantage available to organizations in a turbulent and hyper-competitive global market. Therefore, a number of key drivers are needed to encourage and foster innovation in organizations:

Promote Creative Thinking

Thinking plays a crucial role in any process. Every result is the outcome of creative thinking. Promote every in the organization to participate actively.

Strategy for Innovation

A clear and articulated strategy for innovation must be developed and accepted to encourage innovation across the organization. Strategy development first requires an understanding of the business and its environment, and should involve stakeholder input to ensure buy-in across the organization. Innovative companies have a clear vision and core values that encourage the pursuit of organizational objectives, including innovation initiatives.

Innovation Leadership throughout the Organization

Commitment and support from top management is the cornerstone of successful innovation. Management influence is necessary to overcome the barriers to successful change, which innovators often encounter.

Culture and People

Establishing a culture that is conducive to innovation requires building a work environment where trust, open communication and teamwork are the norm. A team is capable of significant achievements because individual abilities can be pooled towards achieving a common objective. The use of cross-functional teams helps break down the barriers by transcending the existing organizational structure.

Tolerance of Risk

The innovation process generally has an element of risk since any change involves uncertainty. Some organizations are risk averse and usually struggle to become innovative. Organizations that incorporate a higher level of risk tolerance in their business processes are more successful in adopting an innovative climate.

Flexible Operating Structures

Establishing adaptive organizational structures, which are characterized as flat, organic and cross-functional, is a key characteristic of innovative organizations. In an organic structure job definitions are flexible, and both vertical and lateral communication flows exist. Power and authority are generally shared across team members.

New Ideas and Opportunities

The continuous flow and capture of new ideas provides organizations with a source of new products and services, product improvements, and novel processes that contribute to the organization's survival and growth. Creativity is therefore an important key driver of innovation by providing new ideas and new ways to solve organizational problems. Organizations also need to adopt a formal ideas management process to capture, develop, evaluate, protect and implement ideas and suggestions, which form the foundation of new opportunities that satisfy needs and wants in the market.

Promote Individual Growth

Part of an employee's willingness to invest creative energy at work is spawned from the employer's desire to invest in the employee's growth. When employees believe that their own development and growth are valued by their employer, they are more likely to make innovative contributions.

Organize Mandatory Training Programs

Training should be mandatory and tailored to individual needs to ensure that all employees are given the opportunity to benefit from it. Removing the optional component of training instills a culture that supports the temporary release of individuals from demanding roles to ensure their development.

Create a Sense of Belonging

When individuals feel that they belong to an organization, they want it to succeed. A sense of belonging comes from being valued and sincerely appreciated by both peers and management for one's contributions.

Eliminate us and Them

Inclusiveness is the final part of the belonging equation. Eliminate the "us and them" between management and non-management and replace it with "we're all in this together." Invite individuals at all levels to meetings including off-site strategy meetings. When every individual feels that their ideas are valued and appreciated, and that they share a piece of the company's success, an inclusive environment has been created.

Open Communication

The existence of free and open communication channels is favorable to innovation because it provides the opportunity for ideas and information to be relayed throughout the organization.

Build Confidence

Confidence comes from experience, encouragement, and freedom from the fear of making a mistake. Confident individuals are aware of their abilities, do not fear defeat, and are more likely to experiment with innovative solutions. Encouragement is a big part of instilling confidence in individuals, especially younger employees.

Optimize the Work Environment

Flexible, comfortable, and well equipped work environments are most conducive to innovation. Cross-functional teams should have the ability to immediately reserve private spaces where adequate seating, white boards or flip charts, and overhead projection screens are available.

Train Everyone on the Team

How to identify innovative ideas and provide examples of successful innovations in the business or other organizations that produced dramatic results for the company. These examples may be in different industries, but are valuable to show the basic process of applying creative ideas to any product or service.

Schedule Innovation Contests

And structured brainstorming sessions to generate creative ideas. When conducting these types of activities, it is important not to criticize ideas.

Celebrate Successful Innovations

That increase revenue, reduce expenses, or strengthen the company's competitive advantage in the marketplace.

Use Multiple Medium to Bring out the Best

Leaders in a variety of industries have identified multiple mediums where innovative thinking can be captured. Pfizer has successfully implemented a suggestion box program that offers cash bonuses for employee ideas that are put into action. GE frequently holds cross-functional rapid design sessions known as "Work-Outs" to generate innovative ideas and solve business problems.

Do Collaboration and Experimentation

They need to be engrained within the fabric of the organization's culture, and supported through recognition and reward programs.

SUGGESTIONS

1. Be more focused on External Research & Development as it can create significant value. Internal Research & Development is needed to claim some portion of that value.
2. Do not originate any research to profit from it.
3. Build a better business model than the efforts of getting it in the first.
4. Make the best use of internal and external ideas, to win.

CONCLUSION

- Innovation is the key of survival & growth of the company.
- Innovativeness depends upon the sophistication & value creating initiatives of its enterprises.
- It is powerful & critical source of competitiveness at global level both for customers and for talents.
- It is crucial for creating revenues and making profits, and enables sustainable growth over the longer term.
- Setting stretch growth target is also required to drive breakthrough innovation.
- Now a days benchmarking is preferred to be utilized by the top executives.
- Learning from others. Minimizing risks and executing well are the key concepts to be successful in the global market.

REFERENCES

- [1] Wyatt, S. and Hitendra, P., (2005), "How to move up the Innovation ladder," *Asian Management Review*, p. 88, October –December.
- [2] Govindarajan, V. and Trimble, C., (2010), "How to stop the innovation wars," *Harvard Business Review*, p.60.
- [3] Chesbrough, H., (2003), "Open Innovation: The New Imperative for Creating and Profiting from Technology", Harvard Business School Press.
- [4] <<http://www.openinnovation.eu/>>
- [5] <<http://bellmason.cisevents.hightechcampus.nl>>
- [6] <<http://www.openinnovation.eu/openinnovatie.php>>
- [7] <http://www.crm2day.com/content/16_librarynews_1.php?id=EEEpkkkZFpbvcbYBw, Best Practices for Building an Innovative Work Culture>
- [8] The Innovation Bonfire, Blogging Innovation, October 6, 2010.
- [9] <<http://johnkapeleris.com/blog/?p=340>>

Economic Liberalization and the Coffee Export Trade in India

Mili Saxena¹ and Padmini Ravindra Nath²

¹Research Scholar, B.H.U, Varanasi

²Asso. Prof., Women's College, B.H.U

Abstract—Coffee is one of the most widely traded agricultural commodities in the world. It is farmed in eighty countries and exported by over fifty in Central and South America, Africa and Asia. The production and export of coffee has a significant impact on the economic prosperity of the producing and exporting nations. The coffee growing regions in India can be divided into three parts - traditional areas (Karnataka, Kerela and Tamilnadu), non-traditional areas (Andhra Pradesh and Orissa) and north eastern India (the Seven Sisters). The two policy changes that significantly affected the Indian export trade were the collapse of the International Coffee Organization (ICO)'s global market regulation mechanism (economic clause) in 1989, and the reforms initiated by India in 1991. The removal of quantitative restrictions and substantial reduction of import duty on green coffee by majority of the importing countries under the aegis of WTO has added a new dimension to the competitiveness of the coffee trade. The empirical analysis in this paper reveals that coffee exports have grown in importance during the post reform period. This increase has been consistent. The value of coffee exports is impacted by many factors in which the most prominent are area, exchange rate and yield, in that order. Thus we can say that, the government efforts, to promote coffee cultivation as well as the fortunate weakening of the rupee have benefitted coffee exports.

Keywords: Coffee Exports, Economic Liberalization, India

INTRODUCTION

Coffee occupies a place of pride among plantation crops grown in India. It is the most important cash crop that is grown in the tropics. For many of the countries it is the largest source of foreign exchange earnings.

The multi dimensional role of coffee industry in the national economy needs no special emphasis. Generally Coffee is the second largest traded commodity next to petroleum products in India.

As an agro based rural enterprise primarily this industry is a source of direct employment in the area of cultivation apart from providing indirect employment to many in processing and trade sectors. Coffee cultivation is also instrumental in preserving the precious forest ecosystem in traditional areas whereas in non- traditional areas coffee was introduced to check the Podu or shift cultivation and thus to control denudation of forest and also soil erosion.

Although Coffee is one of the major export driven commodities in India, the share of Indian export in global trade was only 1.09 per cent during 1990-91. According to the figures published by Coffee Board, this increased to 3.77 per cent during 2008-09 and has stagnated around that level since then. However, the significance of Coffee as an export commodity lies in its recent performance. In the financial year 2010-2011 Coffee exports have exceeded the target by 44% as per data released by the Ministry of Commerce.

In India, Coffee was the only commodity marketed through a statutory organization viz, the coffee board. The coffee board was constituted under the coffee act (Act VII of 1942) of government of India. The Coffee Board was envisaged as the sole custodian of the marketing of coffee both in the internal and international markets. It takes care of the interests of the producers and consumers and also the research needs for the improvement in the quality and the output of coffee.

Collapse of the International Coffee Organization's (ICO) global market regulation mechanism (economic clause) in 1989, and the market reforms initiated by India leading to dismantling of pool marketing system in 1996 were the two structural changes that have significantly affected the global and Indian markets respectively.

LITERATURE REVIEW

Parikh (1971) with the help of spectral techniques analysed short term fluctuations in coffee prices. He used the original series; trend eliminated series and fitted series for coffee prices recorded in New York market for various grades of coffee. Chengappa (1981) studied the growth rates of area, production and productivity of coffee in India. Linear model of the type $Y(t) = a + bt$ and exponential model of the type $Y(t) = abt$ were used to work out the growth rates. Dass *et al.* (1985) analysed the trends in coffee export in relation to general exports from India for the period 1956-57 to 1982-83. Prakash (1986) evaluated the rates of production, consumption and export of Indian coffee using a modified exponential growth function of the form $\log Y_t = a + bt + et^2$. Gemtessa (1991) compared the performance of Ethiopian coffee exports during the pre-revolution and post-revolution periods. The exponential growth model of the form $Y_t = ab^t e^t$ was employed. Veena (1992) analysed the growth of Indian coffee exports for the period 1965-1990 using exponential function of the form $y = ab^t$. Nagarajaiah *et al.* (2003) studied the impact of low price on cultivation and production of small Robusta coffee plantations in South Coorg. They observed that the low price situation for coffee experienced since late nineties (resulting in low returns in general and negative returns in some cases), forced the small coffee growers to curtail the investment on the farm and to resort to all possible measures to reduce cost of cultivation. Krivonos (2004) evaluates the impact of coffee sector reforms during late 1980 and early 1990 on coffee growers in the main coffee producing countries.

OBJECTIVES AND METHODOLOGY

In the light of the above mentioned studies, the main objectives of this paper are to study the relationship between economic liberalization and exports of coffee in India, identify the trends in the value of exports of coffee in the pre and post liberalization period and analyse the efficacy of state policies in promoting coffee exports.

In order to facilitate the study, the time period under consideration i.e. 1980-81 to 2009-2010 will be divided into two parts – pre reform and post reform with 1991 as the bifurcating line. The tools of analysis will include the use of mean, standard deviation and Multiple Linear Regression. Variables such as Yield per hectare, Area under coffee cultivation and Rupee exchange rate *vis a vis* US Dollar, would be used as dependent variables while the value of coffee exports will be the dependent variable. In order to compare the mean and standard deviation of pre and post reform periods, the two time periods will be included in the analysis in the form of dummy variables with pre reform period coded as zero and post reform period as one. The multiple linear regression model is however built without this bifurcation on the basis of available data from 1980-81 to 2010-11. The secondary data is mainly sourced from the relevant issues of RBI handbook of statistics.

DISCUSSION

A comparison of pre and post reform periods regarding the export value, area and yield is given in table 1.

Table 1

Time		Yield	Area	Exports
pre Reform	Mean	702.90	.2100	2.3118E2
	N	10	10	10
	Std. Deviation	177.078	.01155	7.85015E1
Post reform	Mean	838.29	.3076	1.3527E3
	N	21	21	21
	Std. Deviation	66.433	.06495	6.72073E2

*Calculated by the author

1. From **table 1**, it can be seen that the mean value of yield and area has increased in the post reform period, showing an improvement in the productivity of coffee in India.
2. The mean value of exports has reduced in the post reform period, but the standard deviation is reduced showing less fluctuations in the coffee exports in the post reform period.

The growth in India's coffee exports in the post reform period can be easily analysed from the above graphs. However, there are fluctuations in the exports but there is a rising trend in the post reform period as compared to that of the pre reform period.

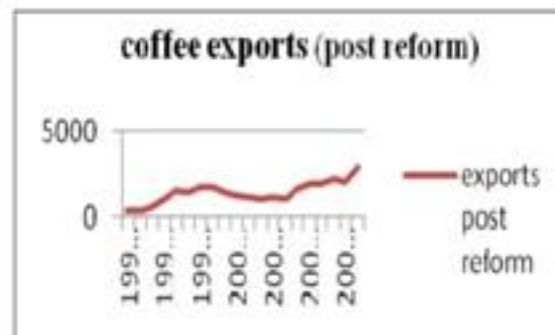


Fig. 1

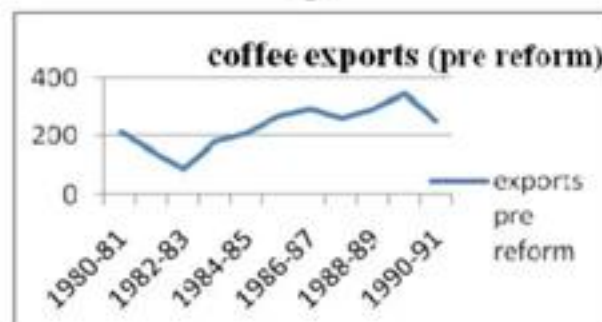


Fig. 2

In table 2, the results are shown of a multiple linear regression of the following form:

Table 2

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.887 ^a	.786	.763	373.19259		
Predictors: (Constant), area, yield, exrate						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta (β)		
1	(Constant)	-1394.595	638.428		-2.184	.038
	yield	.068	.649	.011	.105	.917
	exrate	13.194	11.192	.258	1.179	.249
	area	7004.304	2156.356	.647	3.248	.003
a. Dependent Variable: exports						

* Calculated by the authors

Export value of Exports = $b_0 + b_1 \text{ area} + b_2 \text{ yield} + b_3 \text{ exchange rate} + E_i$

An analysis of the table 2 shows the following trends:

1. The multiple R with a large value of 0.887 represents a large correlation between the predicted and observed values of the outcome.
2. R² (which is the amount of variation in the outcome variable accounted for by the regression model) is also sufficiently high at 0.786.
3. The unstandardized coefficients (b) values, tells us the relationship between export value and each predictor. In this case all the b values are positive indicating the positive relationship.
4. The b values also tell us to what degree, each predictor affects the outcome if the effects of all other predictors are held constant.
 - Yield (b = 0.068): It indicates that as yield increases by one unit, value of coffee exports increases by 0.068 units.
 - Exchange rate (b = 13.194): It indicates that as exchange rate (dollar price in rupees) increases by one unit, value of coffee exports increases by 13.194 units.
 - Area (b = 7004.304): It indicates that as area increases by one unit, value of coffee exports will increase by 7004.304 units.
5. The standardized Beta values (β) tell us the number of standard deviations, the outcome will change as a result of one SD change in predictor. The β values of yield (0.011), exchange rate (0.258) and are (0.647), show the standard deviations change in export value as a result of one standard deviation change in above mentioned predictors.

Thus, we can say that area under cultivation seems to be the most important factor influencing India's coffee exports.

POLICY PERSPECTIVES

The Indian government provides various subsidies, mostly to small and marginal coffee producers to increase production and improve quality. The Coffee Board provides subsidy for coffee replanting, water conservation, quality upgradation, etc.

The Agricultural Insurance Company of India Ltd., a government parastatal, is now providing a Rainfall Insurance Scheme—Coffee (RISC), a unique rainfall insurance product specially designed for the coffee growers of Karnataka, Kerala and Tamil Nadu. This product is designed in consultation with the Coffee Board, the Central Coffee Research Institute and the Coffee Growers of these states. RISC is expected to provide effective risk management aid to those coffee growers likely to be impacted by adverse rainfall incidence. The Coffee Board is extending a premium subsidy of up to 50 percent of the premium for small and marginal growers (with plantation size up to 10 hectares).

The Coffee Board is providing a subsidy to enhance the quality of coffee products and achieve value addition through introduction of improved technologies in coffee roasting, grinding and packaging.

The GOI's Department of Commerce has approved the implementation of the Scheme for the Export Promotion of coffee by the Coffee Board. The objective of this subsidy program is to enhance the export of Indian branded value added coffees and high value coffees to far off markets such as the United States, Canada, and Japan. The export incentives under this program are: (a) incentive for exports of Indian branded value added coffee at the rate of Rs. 2 per kg (b) incentive to export high value coffees to far off markets such as the United States, Canada, and Japan at the rate of Rs. 1 per kg.

The Ministry of Commerce has included coffee in the list of products eligible for the duty entitlement passbook (DEPB) scheme and the *Vishesh Krishi Upaj Gramodyog Yojana* (VKUGY). The objective of DEPB is to neutralize the incidence of the customs duty on the import content of the exported product, by granting a duty credit against the export product. The duty credit (4% of the FOB value in the case of coffee) can be used for imports of raw materials, intermediates, components, parts, packaging material etc. and is tradable. Duty Credit (5%) is also given under the VKUGY, which may be used for the import of inputs or goods including capital goods, as may be notified by the government. Total duty credit under both the programs together is subject to a maximum of 7.5 percent.

The Ministry of Commerce has included coffee in the list of products eligible for the duty entitlement passbook (DEPB) scheme and the *Vishesh Krishi Upaj Gramodyog Yojana* (VKUGY). The objective of DEPB is to neutralize the incidence of the customs duty on the import content of the exported product, by granting a duty credit against the export product. The duty credit (4% of the FOB value in the case of coffee) can be used for imports of raw materials, intermediates, components, parts, packaging material etc. and is tradable. Duty Credit (5%) is also given under the VKUGY, which may be used for the import of inputs or goods including capital goods, as may be notified by the government. Total duty credit under both the programs together is subject to a maximum of 7.5 percent. (Coffee Annual, GAIN Report, USDA, Foreign Agricultural Services)

CONCLUSION

The empirical analysis in this paper reveals that coffee exports have grown in importance during the post reform period. This increase has been consistent. The volume of coffee exports is impacted by many factors in which the most prominent are area, exchange rate and yield, in that order. Thus we can say that, government efforts, to promote coffee cultivation as well as the fortunate weakening of the rupee have benefitted coffee exports.

REFERENCES

- [1] Chengappa, P.G., (1981), "Growth rates of area, production and productivity of coffee in India," *Journal of Coffee Research*.
- [2] Coffee Annual, (2010), Global Agriculture Information Network Report, USDA Foreign Agricultural Services.
- [3] Coffee Export from India, (2010), Working Paper, IIFT, Ministry of Agriculture, GOI.
- [4] Dass, S.R., Vashist, A.K. and Singh, C., (1985), "Quantum, unit value and export value of coffee exports," *Agricultural Situation in India*.
- [5] Database on Coffee, Coffee Board of India, (various issues)
- [6] Economic Survey, GOI, (various issues)
- [7] Food and Agriculture Organisation (FAO). Statistical Database. <www.aps.fao.org>
- [8] Gemtesa, K., (1991), "An analysis of the structure of Ethiopian coffee exports" M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore.
- [9] Handbook of Statistics on Indian Economy, RBI, Various issues
- [10] International Coffee Organization (ICO), (1999) Coffee Statistics.
- [11] Indira, M., (1988), "An economic analysis of coffee marketing in India," Ph.D Thesis, University of Agricultural Sciences, Bangalore.
- [12] Krivonos, E., (2004), "The impact of coffee market reforms on producer prices and price transmission," Policy research working paper series. The World Bank.
- [13] Pavitha, M.T, (2005), "Post Liberalization Scenario of Coffee Industry: A case of Coorg district," M.B.A Thesis, University of Agricultural sciences, Dharwad.
- [14] Radhakrishnan, S., (2004), "Performance and direction of coffee exports from India," *Indian Coffee*,
- [15] Shende, N.V., Bhole, B.D. and Shende, P.V., (1999), "Export performance of India in tea, coffee and tobacco," *Indian Journal of Agricultural Marketing*
- [16] Veena, U.M., (1992), "An econometric analysis of Indian coffee export," M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore.

Role of Marketing and Promotional Practices in Small and Medium Enterprises: With Special Reference to Moradabad and Nearby Region

Satyendra Arya, Avinash Rajkumar and Abhinav Srivastava

Lecturer, CMCA, TMU

Abstract— A small business is a business that is privately owned and operated, with small number of employees and low volume of sales. These are generally privately owned corporations, partnerships and sole proprietorships. These can be classified as sales, assets or net profits. These are common in many countries, depending on the economic system in operation. Typical examples include: convenience stores, bakery, hairdressers, trading, restaurants, guest-houses, photographers, small-scale manufacturing, and online business, such as web design and programming, etc.

The study related to SME in Moradabad region was undertaken to find out if the SME in Moradabad has performed its critical role of driving the country's industrial transformation and development. This study investigated the marketing and promotional practices of SMEs in Moradabad and nearby region.

Keywords: SME, Partnerships, Marketing, Promotion

INTRODUCTION

An increasing body of literature indicates that small and medium sized enterprises (SMEs) are of major importance for macro-economic growth. Proportional to their size, small firms create more jobs than large firms do. Small enterprises have an advantage in radical innovation. Finally, in industries where the SME sector is bigger, large firms are often more efficient because they outsource activities to smaller firms. These positive structural contributions of SMEs to macro-economic performance more than outweigh the fact that on average, large enterprises outperform SMEs with respect to labor productivity and profitability.

SME BY SIZES

SMEs in this report are defined as enterprises in the non-financial business economy that employ less than 250 persons. The complements of the SME-sector – enterprises that employ 250 or more persons are large scale enterprises. Within the SME-sector, the following size classes are distinguished: micro enterprises, employing less than 10 persons (including self-employed), small enterprises, employing at least 10 but less than 50 persons (including self-employed), and medium-sized enterprises that employ between 50 and 250 persons (including self-employed).

ADVANTAGES OF SMALL BUSINESS

- A small business can be started at a very low cost and on a part-time basis.
- Small business is also well suited to internet marketing because it can easily serve specialized niches.
- Small business proprietors tend to be intimate with their customers and clients which results in greater accountability and maturity.
- Independence is another advantage of owning a small business. One survey of small business owners showed that 38% of those who left their jobs at other companies said their main reason for leaving was that they wanted to be their own bosses.
- Freedom to operate independently is a reward for small business owners.
- However, entrepreneurs have to work very long hours and understand that ultimately their customers are their bosses.

PROBLEMS FACED BY SMALL BUSINESSES

- Small businesses often face a variety of problems related to their size. A frequent cause of bankruptcy is undercapitalization. This is often a result of poor planning rather than economic conditions.
- In addition to ensuring that the business has enough capital, the small business owner must also be mindful of contribution margin (sales minus variable costs). To break even, the business must be able to reach a level of sales where the contribution margin equals fixed costs. When they first start out, many small business owners under priced their products to a point where even at their maximum capacity, it would be impossible to break even. Cost controls or price increases often resolve this problem.
- Another problem for many small businesses is termed the 'Entrepreneurial Myth' or E-Myth. The mythic assumption is that an expert in a given technical field will also be expert at running that kind of business. Additional business management skills are needed to keep a business running smoothly.

- The illiteracy and poor management practices are also a major problem.
- Lack of internet based practices is generally faced by small and medium level entrepreneurs.
- They do not use appropriate marketing and promotional tools are also a problem.
- Still another problem for many small businesses is the capacity of much larger businesses to influence or sometimes determine their chances for success.

MARKETING AND PROMOTIONAL TECHNIQUES IN SMALL AND MEDIUM ENTERPRISES

The marketing concept is a philosophy that makes the customer, and the satisfaction of his or her needs, the focal point of all business activities. *Marketing is the social process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others* (Kotler)

Marketing for SMEs' is very important, there are two strong reasons why it is important to view marketing as being different in this context.

- One is the recognition that SMEs (small to medium sized enterprises), are not simply little big business. By a definition of size they are certainly small to medium sized in relation to large organizations; however, as a consequence of its size an SME has unique characteristics which make it distinctly different, not only to large corporations but also to many or all other enterprises.
- A significant second factor is the relative number of SME enterprises to large

Common marketing techniques for small business include networking, word of mouth, customer referrals, yellow pages directories, television, radio, outdoor (roadside billboards), print, email marketing, and internet. Electronic media like TV can be quite expensive and is normally intended to create awareness of a product or service. Many small business owners find internet marketing more affordable. Google Ad Words and Yahoo! Search Marketing are two popular options of getting small business products or services in front of motivated Web searchers. Advertising on niche sites can also be effective, but with the long tail of the internet, it can be time intensive to advertise on enough sites to garner an effective reach. Creating a business Web site has become increasingly affordable with many do-it-yourself programs now available for beginners. A Web site can provide significant marketing exposure for small businesses when marketed through the Internet and other channels.

SMEs are the typical business model of the Indian entrepreneurial system and a lot of these SME are family business. The main relationship built with big enterprises are franchising and supply chain relations (to support the growth and the market penetration), licensing and joint venture (to support the innovation, the product development, the learning organization, to receive financial resources), and other contracts'. Greater cooperativeness, sense of community, innovation, strategic flexibility and core competence are necessary to SME's growth and competitiveness. We can try these features into the network systems, where economic exchange is embedded inside a network of social and trust relations. Trust is necessary to create cooperation and value by the relations. The economic effects, largely, are low cost, learning, market penetration and growth of management competencies.

A marketing plan for a small business typically includes:

1. Demographics of customers
2. Description of external environment and competitors, including the level of demand for the product or service and the strengths and weaknesses of them (SWOT)
3. Marketing Strategy: Segmented marketing actions and market share objectives by product, by customer segment, by geographical market, by distribution channel.
4. Description of the product or service, including special features.
5. Marketing Budget, including the advertising and promotional plan.
6. Description of the business location, including advantages and disadvantages for marketing.
7. Pricing and promotion strategy: goals, mix, tools
8. Distribution: geographical coverage; distribution channels, physical distribution and logistics, electronic distribution.
9. Economic and Financial Summary: sales goals; income statement.

Governments had formulated policies aimed at facilitating and empowering the growth and development and performance of the SMEs, others had focused on assisting the SMEs to grow through soft loans and other fiscal incentives. Finance is usually considered as the major constraints of SMEs some of the challenges that SMEs face are induced by the operating environment (government policies, globalization effects, financial institutions, local government policies, attitude to work etc), other challenges are driven by the inherent characteristics of the SMEs themselves.

OBJECTIVES OF THE STUDY

- To find out the marketing strategy of SMEs with special concern on handicraft industry in Moradabad and nearby region.
- To what extent are SMEs using the internet to fulfill promotional objectives?

- To know how SMEs typically start implementing their online marketing strategy.
- To know the best ways for SMEs to operate B2B portals for efficient business transactions.

RESEARCH METHODOLOGY

The research methodology, which is adopted in my research is as follows;

DATA COLLECTION AND METHODOLOGY

Sampling Unit

The units chosen for survey were employees of the organization

Sample size: 43

Sample Selection Method

Stratified Random Probability Sample Selection Method.

Research Instrument

Questionnaire

The secondary research that we will be carrying out will include an academic literature review and the analysis of quality online news feeds which deal with the latest issues in online marketing.

ANALYSIS OF THE DATA

Q. No.1 Kinds of Organization

Manufacturing	47%
Services	9%
Construction	4%
Export	40%

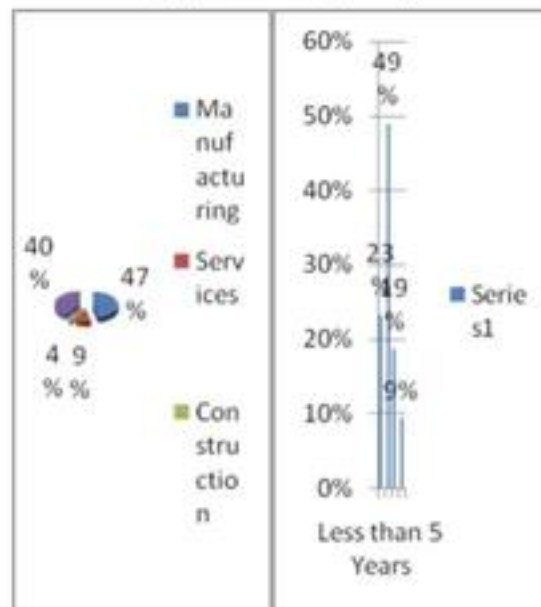


Fig. 1

It is clear from the above Chart that most of the firms are manufacturing firms and some deals with import and Export activities and rest are belong to services and constructions.

Q. No.2. For How Long the Company has been in Operations?

Less than 5 Years	23%
5 to 10 years	49%
10-15 years	19%
More than 15 years	9%

82. Modified Cellular Message Encryption Algorithm <i>Ravindra Kumar Gupta and Subhash Chandra Gupta</i>	375
83. Binary Matrix Based Similarity and Dissimilarity of Classes <i>Bharti Chhabra and Sunil Kumar</i>	381
84. Effect of Association Rule in Data Mining <i>Sushma Rana, Wajid Ali and Gulista Khan</i>	385
85. Energy Efficient Routing Strategy for Dynamically Arranged Homogeneous WSN <i>Gulista Khan, Hari Om Sharan and Kamal Kumar Gola</i>	391
86. Higher Order Mutation Testing (Disastrous to Kill Mutants) <i>Shalini Kapoor and Rajat Kapoor</i>	396
87. Effect of Scalability and Mobility on TCP Performance using Routing Protocols in Mobile ADHOC Network <i>Meenakshi Kamboj, Pooja Dhiman, Vandana Singla and Richa Gupta</i>	401
88. Throughput Performance Analysis of IEEE 802.11b Wireless LAN <i>Madnesh Kumar Gupta, Ganesh Gupta and C.S. Rai</i>	406
89. Analysis of Risk is a Need to Improve Software Quality: A Review <i>Nitin Deepak and Shishir Kumar</i>	410
90. Service-Oriented Computing & its Framework <i>Vinay Goyal and Amit Jain</i>	417
91. Design a Web Crawler using VB.NET Technology <i>Sushil Kumar, Bharti Mittal and Deepak Kumar</i>	420
92. Distributed Sensor Network for Nuclear Reactor based on Labview <i>Pratibha Mondal and G. Vimala Rani</i>	423
93. Changing Paradigms for World Class ERP in Resurging India <i>Rashmi Jha and A.K. Saini</i>	429
94. An Analytical Study on Load Balancing and Task Allocation to Processors in a Distributed Computing Environment <i>Pankaj Saxena and Rajendra Belwal</i>	437
95. Cloud—A Solution to Piracy <i>Mohit Mayunk Bhutani and Sahil Aneja</i>	440
96. Awareness of Various Methods and Techniques of Green Computing in Offices of Delhi-NCR <i>Madhur Raj Jain and Aditi Midha</i>	445
97. An Efficient Use of Cloud Computing in e-Governance <i>Amit Kumar, Ajay Rastogi and Sanjeev Kumar</i>	452
98. Routing Protocol and Security Issues for VANET (Vehicular Ad-Hoc Network): A Survey <i>Monika Singh, R.K. Singh and Shruti Saxena</i>	456
99. Insight into PDF Workflows for Print Production <i>Priyank Singhal</i>	460
100. An Approach of Green Computing <i>Manish Joshi, Chanchal Chawla and Amit Gupta</i>	467
101. Optimization of Server Management for WebSphere Application Server <i>Rajeev Ranjan, Wajid Ali and Shusma Rana</i>	470
102. Wireless Security in IGNOU <i>Vidya Varidhi Upadhyay</i>	474
103. A New Concept of Data Mining: Data Stream Mining <i>Kuldep and Sumit</i>	478

The above chart shows that mostly firms have been from 5 to 10 years. 23% firms are established from 5 years and rest are from 4 to 8 years. These firms has a large experience about the marketing of products but they still need improvement in its marketing techniques.

Q. No. 3 How Many Number of People Employed in Your Enterprise?

1-15 employees	7%
15-30 employees	23%
30-45 employees	58%
More than 45	12%

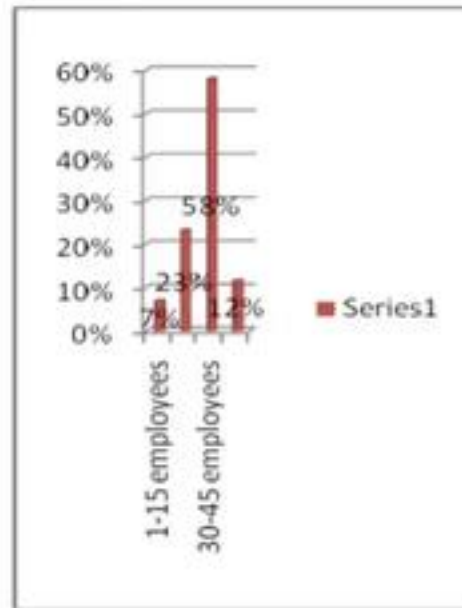


Fig. 2

It is clear from the analysis that 58% firms employed 30-45 employees and 23% firms employed 15-30 employees. It shows that SMEs are good source of income and career for the people belongs to moradabad.

Q. No. 4 Company Deals in

Raw material	19%
Semi finished goods	67%
Finished goods	9%
All of above	5%

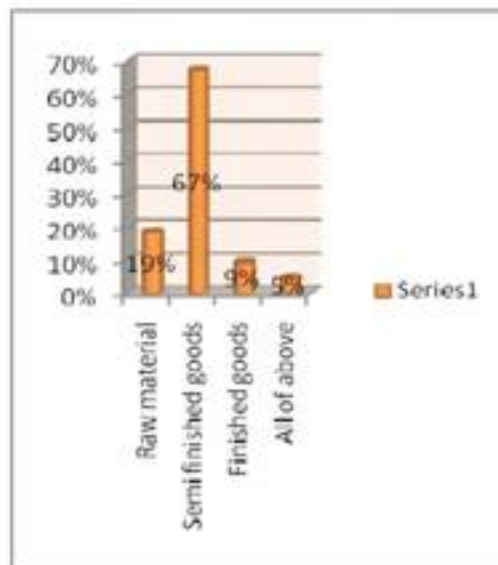


Fig. 3

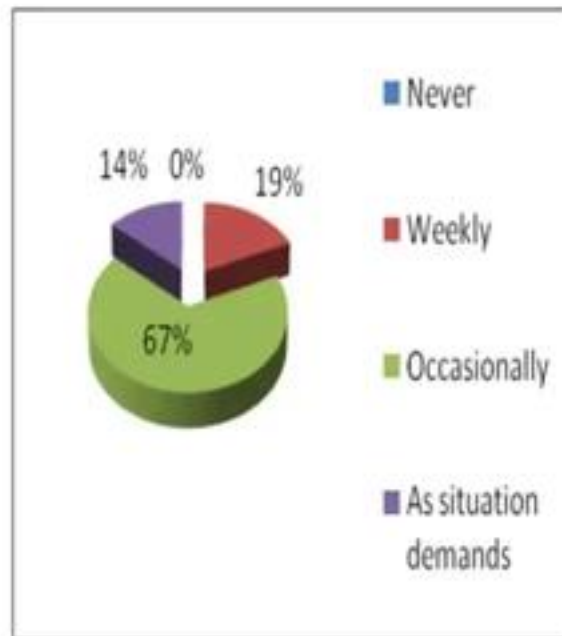


Fig. 4

The above chart shows that mostly firm are producing semi finished goods. Semi finished goods are used by another firms as their raw material and 19% firms are deals with raw material.

Q. No. 5 Sources of Material

Domestic Market	31
International market	12

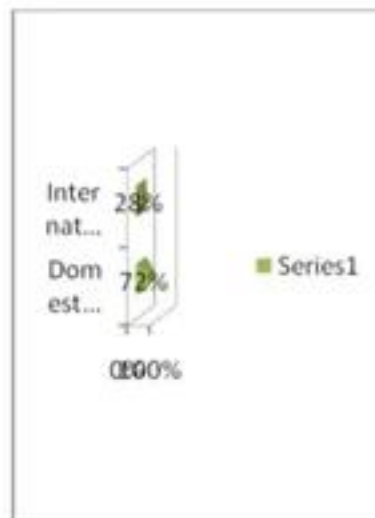


Fig. 5

The above chart shows that mostly firms purchase their material from domestic market it shows that there is availability of raw material in domestic market.

Q. No. 6 Company Conduct the Meetings

Never	0%
Weekly	19%
Occasionally	67%
As situation demands	14%

It is clear from the above chart that 67% firms conduct the meetings occasionally, 19% firms' conduct the meetings weekly and 14% are in favor of as situation demands. It shows that these firms managing their enterprise in proper manner.

Q. No. 8 Do You Prepare the Annual Budget for Your Enterprises?

Yes	95%
No	5%

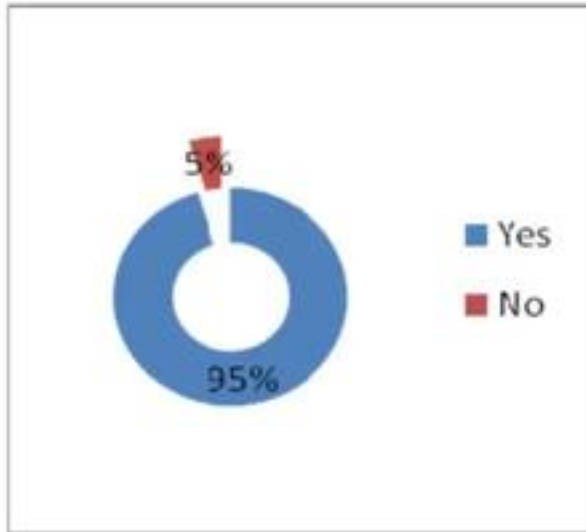


Fig. 6

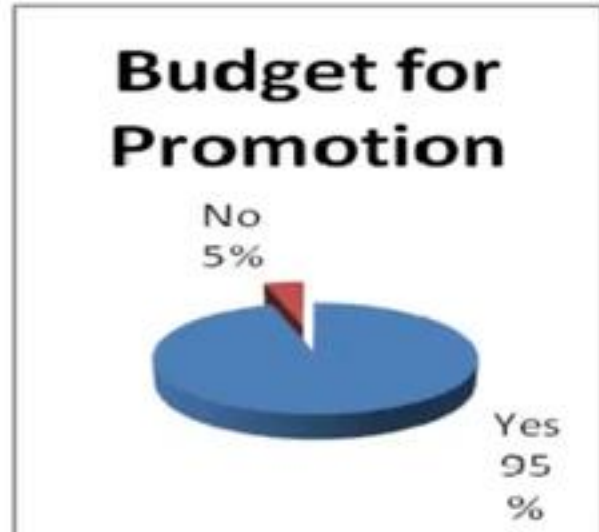


Fig. 7

The chart shows that firms make their annual budget so that they can compare the actual performance from budgeted and if there is any large gap between budgeted and actual performance and cost of the products then these firms can take corrective actions to fill the gap and enhance the productivity.

Q. No. 9 What is the Average Qualification of Your Employees?

Senior secondary	5%
Graduation	72%
Post graduation	14%
Other Technical courses	9%

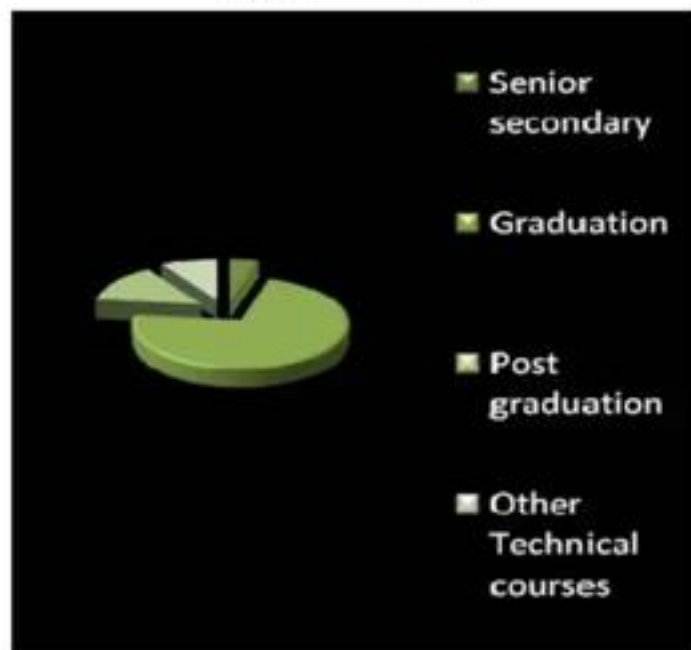


Fig. 8

It is clear from the above pie-chart that 72% are graduated employees and 14% employees are having post graduate degree. It means that employees are educated enough to perform their responsibilities and duties.

Q. No. 10 Do you have any Budget for Promoting of Products?

Yes	95%
No	5%

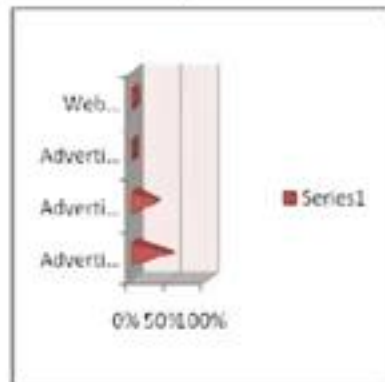


Fig. 9

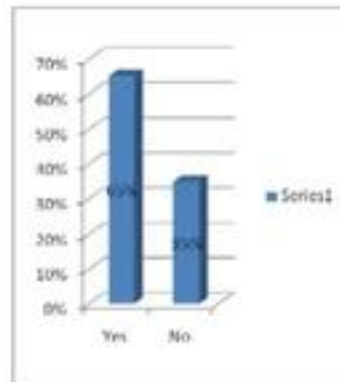


Fig. 10

Promotion budget is forecasting or estimation of cost that the company is going to incur on the promotion of its product. Chart shows that mostly firms makes promotion budget to promote their product. It means that SMEs reduce their wastage of money by proper utilization of resources and with help of promotion budget.

Q. No. 11 What Mode of Marketing should you Take for Promoting the Products?

Advertisement in news Paper	53%
Advertisement on Internet	35%
Advertisement Magazines	5%
Web Portals	7%

After manufacturing of the products it is very necessary to advertise your product so that customers can be aware about your product. There are various modes of promotions. It is clear from the above chart that 53% firms advertise their product in news paper because news paper covers wide area. 35% firms promote their product with help of internet.

Q. No. 12 Online Promotion of Products

Yes	28
No	15

As we know that Information Technology has become the inseparable part of our lives so mostly firms are using technology to manufacturing and promotion of their products. According to our analysis 65% firms are using internet in spreading awareness about their product. 35% firms are not using online promotional schemes but these firms are planning for it because we know that our society is not so much Techno- friendly therefore it will take some time to use technology but gradually these firms also promote their products online.

Q. No. 13 Techniques of Online Promotion

Search engine optimization	28%
Pay per click	7%
E-mail marketing	60%
Others	5%

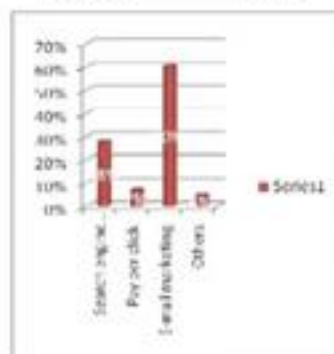


Fig. 11

The above chart shows that those firms which are using Network for online promotion of their product they promote their products with help of e-mail marketing 28% firms are in favor of Search engine optimization.

Q. No. 14 Selling Strategies

Recent selling trends	16%
Direct marketing	12%
Selling through Intermediaries	72%

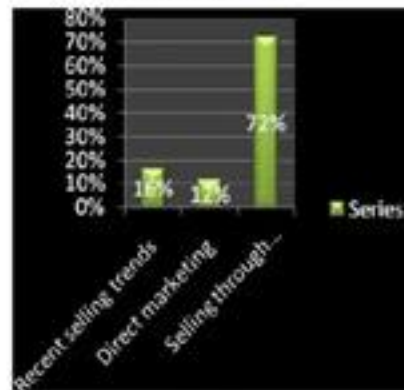


Fig. 12

The analysis shows that few firms are taking advantage of a recent trend in selling and mostly market their products through intermediaries. Lessons learned show that most organizations in the study market to existing Private-sector markets, rather than creating "alternative" markets; they market to

Q. No. 15 Market Research and Positioning

Trade journals	77%
Non profit programmed	12%
Personal networking	12%

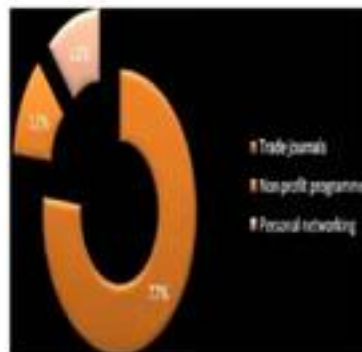


Fig. 13

The above chart shows that mostly firms gather information about market with help of trade journals.

CONCLUSION AND FINDINGS

- Most of the firms of Moradabad are manufacturing firms and they are established from ten to fifteen year.
- The firms need to develop better skills in selling marketing services. Firms should use recent selling methods and strategies to capture the attention of customers.
- The SMEs still has much to learn in the area of market research.
- SMEs in Moradabad are using news papers magazines and Internet to promote their product.
- Firms make annual budget for marketing and manufacturing the products for optimum utilization of resources and reduce the wastage.
- Firm conduct the meetings occasionally and according to situation's need to facilitate the management functioning in smooth and proper manner.

LIMITATIONS OF THE STUDY

Certain Limitations were encountered in the course of this study. Key among these include:

Unavailability of Data

One of the greatest challenges the researcher encountered in this study relates to access to and collection of hard data due to extreme data gaps and paucity.

Time and Funds

Another limitation of this study relates to time, funds and logistics constraints, which limited the intensity of the spread or area of coverage of the study.

Resistance of Respondents

The researcher was also limited by the reluctance of some respondents to complete the questionnaires promptly and those who even failed to complete them at all.

Materials

Mass literature on SMEs in scattered form abound but published data on categorizing and ranking of problems facing SMEs.

REFERENCES

- [1] <http://www.download-it.org/free_files/filePages%20from%20Chapter%2029.%20Marketing%20for%20small-to-medium%20enterprises.pdf>
- [2] <<http://svilopimserbia.com/download/Marketing%20in%20SMEs.doc>>
- [3] <<http://eng.ram.ru/sme/index.html>>
- [4] <<http://www.semsme.com/>>
- [5] <<http://www.novell.com/communities/node/6852/smart-email-marketing-tips-small-medium-enterprises#top>>
- [6] <<http://www.emeraldinsight.com/journals.htm?articleid=854520>>
- [7] <<http://www.jstor.org/pss/40229400>>
- [8] <<http://www.hypersphere.com.au/sme-services.htm>>
- [9] <<http://sbinfocanada.about.com/od/businessinfo/g/SME.htm>>
- [10] <http://www.microfinancegateway.org/gm/document-1.9.27123/28006_file_sme_marketing_prog_10.pdf>
- [11] <http://msme.gov.in/MSME_Development_Gazette.htm>

Innovation—A Pillar for a Successful Entrepreneur

Roma Khanna, Surbhi Chauhan and Shachi Gupta

CMCA, TMU

Abstract—With the changing business scenario the taste and preference of the customers changes very frequently, the market fluctuates every day so, to survive in this unpredictable market entrepreneurs need to do innovation in their existing product and services. Entrepreneur do innovation to differentiate itself from the competitors and create positioning in their target market. While doing innovation entrepreneurs need to do SWOT analysis and follow a particular path. Though entrepreneurs face various challenges in implementing innovation still it is needed to grow. While implementing innovation entrepreneurs should take care of ethical standards. This paper explores the need of innovation, problems faced by entrepreneurs in implementing innovation, benefits derived from innovation. The paper also covers a case study which shows the how a small entrepreneurs can be transformed to an industrialist by implementing innovation.

Keywords: Innovation, Entrepreneur, creativity, Ethics.

INTRODUCTION

Innovation is the ability to combine ideas in a unique way and serve as a definite tool for entrepreneurs to exploit opportunity for different product and services. There is a strong need for an entrepreneur to identify the need of innovation, sources and various principles of successful innovation. Entrepreneur should be aware of the fact that innovation and competitiveness has direct relationship as innovation is a base on which competitors compete with each other and maintain a competitive environment. In such a competitive environment those companies and entrepreneurs can survive which undergo innovation in their business. Innovation generates economic value, new jobs in the economy and culture of entrepreneurship. By virtue of its relationship with competitiveness, innovation emerges as a factor in promoting economic growth.

Entrepreneur focus on internal as well as external aspects for innovation such as maintaining a specific innovation department, rewarding creative employees, managing a change and knowledge, allocating funds, forecasting possibility of success, updating technology, maintaining physical locations for innovation, forming cross functional teams and R& D. Along with above mentioned aspects creativity play a vital role in implementing innovation thus innovation and creativity are interrelated and involves individual as well as organizational efforts.

An idea is the base of any innovation that is all the principles of innovation originates from a simple idea. Idea involves creativity which together can lead to innovation and this idea can be generated at any level of management. An Entrepreneur should focus on certain key elements which are required for its growth such as strategy, structure, leadership, systems processes, values and culture, rewards, enabling technology, physical environment, talent community and knowledge creation.

Various strategies are framed by an entrepreneur to successfully deal with innovation. It involves creation of growth strategies, new product categories, services or business models that change the business operations and generate significant new value for consumers and the corporation. These strategies also deal with different areas like finance, HR, Marketing and IT. As the globalization is occurring, entrepreneurs need to change the pattern of framing strategy as the traditional view was senior management hamper out the strategy and hands it down. Gary Hamel offers the contrasting view that imaginative idea on strategy exist in many places within a company. Senior management should identify and encourage fresh ideas from youthful perspective, employees who are far removed from company headquarters and employees who are new to the company. Now the entrepreneurs expect that these people may be capable of stimulating new ideas and can challenge company orthodoxy.

Without a systematic process both principles and strategy for implementation of innovation is worthless. The process can also change with the updating business environment. So continuous monitoring on the process for different product and services to be offered should be done. A path through which innovation can be successfully implemented by an entrepreneur is idea generation, idea screening, feasibility and then implementation.

An entrepreneur face various hurdles and challenges in the path of innovation. These barriers can be internal as well as external. The external factors which creates challenges is lack of emphasis on industrial Innovation, lack of effective collaboration with other companies, excessive government regulation. While internal factors are lack of organizational focus on Innovation as a strategy for growth and competitiveness; inefficient knowledge management systems within the company; and poor understanding of customer needs and market dynamics.

There is in fact a strong relation between innovative and ethics. Only those entrepreneurs succeed who follow both innovation and ethics. Such companies are flexible, able to take risk, appreciated and rewarded by others. They actively collect employees' ideas and opinions and strive to create a climate where everyone feels to be the part of organization. Entrepreneur must encourage ethical behavior in every area of organization so that other can develop trust and satisfaction. However, until leaders see ethical conduct as essential to achieving business goals, organization will be far behind from the success. According to survey done in 2010 there are number of companies which are known for its ethical behavior like Ford company, Xerox, General mills, PepsiCo, Vodafone group, HDFC, Starbucks Coffee Company, L'oreal etc.

BENEFITS OF INNOVATION

Every entrepreneur require innovation for business existence, for capturing market share, to take advantage of an opportunity, to raise the standard of living,for competitive advantage,and for building corporate image.

Here, we are discussing two case studies, that try to explain how an innovative idea become a successful business plan.

Case 1: MBA Sabziwala

Kushlendra, an alumus of the Indian Institute of Management Ahemdabad (IIM A) refused several attractive offers from big MNCs, He wanted to work towards making Bihar a better place. This young entrepreneur has an implacable business sense and was successful in his earlier project of selling vegetables through ice-cooled push-carts in Bihar. This 20-year-old genius is now working hard on his Organized Vegetable Marketing (ORVEM) project to enable people to buy vegetables through pre-paid cards.

His project of selling vegetables through ice-cooled push carts become a hit in Bihar. He is also sick of the corruption in the state that has caused a dent in his business plans. "Madhya Bihar Gramin Bank has sanctioned a loan for nine AC carts to our nine vendors under the government scheme but they are not disbursing the amount...what I have been able to understand is that the bank is looking for some under-the-table dealing that we never do or promote," he said.

Case 2: Electrotherm India Ltd.

Electrotherm India Ltd., an Ahemdabad-based induction furnace technology company, has launched a range of battery-powered two wheelers in Gujrat. These vehicles are unique as they are neither require registration & payment of road tax, nor do they require driving license to drive them. Electrotherm is sourcing batteries form india & abroad, & has set up a 1.2-lakh vehicles per annum facility at samakhiali in the Kutch district of Gujrat.

The company claims that the YOBikes have a range of 40- 60 km on a four- hour charge & have a top speed of 2 5 km per hour to stay within the Government norms for vehicles that do not require registration. The pricing to two wheelers is aggressive & ranges from Rs. 13,999 to 23,249. The Company believes that prices are very competitive, which is required, as it is a unique product.

Electrotherm has also developed a battery-powered three-wheeler auto rickshaw in collaboration with the National Institute of design. The company is also working on battery-powered buses & has developed the prototype of a 14-seater bus.

CONCLUSION

Innovative new products are essential to the progress of any society. When innovation processes are properly managed, an expanding variety of new products stream forth. These products respond to the changing needs of a society whose welfare is constantly increasing.

This is the era of globalization and many MNCs are entering in to Indian market& creating cutthroat competition as they are offering better products & services to the customer at affordable price. Along with the price as a factor of attracting customers, they also offer additional benefits to attract them. This poses threat to other entrepreneurs. So to survive in this competition, entrepreneurs need to prove themselves by differentiating their products & services. This can be done by focusing on aspects like creativity, efficient strategy, market analysis, framing ethical principals & following sequential process. Conducive environment and trust can be created by an entrepreneur by implementing innovation that also leads to create collective wealth for the organization as well as contribute to the growth of the country. The innovation be it product, process or any other type of innovation can be converted into a sustainable competitive advantage to make a firm standing in the arena of business. It is proved by the innovative entrepreneurs that innovation has benefited their business in many aspects but it is also a bitter truth that the path of innovation is full of challenges and while implementing innovation entrepreneur face various internal as well as external barriers.

REFERENCES

- [1] Kumar Arun; N, Meenakshi, Marketing Management
- [2] Kotler Philip;Keller, Koshi, Jha, Marketing Management (A South Asian perspective)
- [3] Blackwell, Basil, and Samuel Eilon. *The Global Challenge of Innovation*. Boston: Butterworth-Heinemann, 1991.
- [4] Brown, John Seely, ed. *Seeing Differently: Insights on Innovation*. Boston: Harvard Business School Press, 1997.
- [5] Blackwell, Basil, and Samuel Eilon. *The Global Challenge of Innovation*. Boston: Butterworth-Heinemann, 1991.
- [6] Brown, John Seely, ed. *Seeing Differently: Insights on Innovation*. Boston: Harvard Business School Press, 1997. <www.ndtv.com>
- [7] <<http://www.innovation-point.com/Strategic%20Innovation%20White%20Paper.pdf>>
- [8] <<http://www.amcreativityassoc.org/Articles/Cohen-P%2010%20Reasons%20Why%20We%20Need%20INNOVATION.pdf>>
- [9] <http://www.knowledgecommission.gov.in/downloads/documents/NKC_Innovation.pdf>
- [10] <<http://www.tourismexcellence.com.au/Fostering-Innovation/Innovation-Meaning-Myths.html>>
- [11] <http://unu.edu/wp-content/uploads/publication/000/011/875/policy_brief_11-01_web_rev.pdf>
- [12] <<http://www.referenceforbusiness.com/encyclopedia/Inc-nt/Innovation.html#ixzz1kaYwcSUW>>

Role and Importance of Small and Medium Scale Enterprise in Developing Nation

Paridhi Narang and Shipra Kaushik

*Lecturer, Department of Home Science,
Teerthanker Mahaveer University*

Abstract—A business whether small or big, simple or complex, private or public is created to provide competitive prices. Business in our under developed country has been classified as small, medium and large. In both the developed and developing countries, the government is turning to small and medium scale industries, as a means of economic development and a veritable means of solving problems. It is also a seedbed of innovations, inventions and employment. Presently in developed and developing country, SMEs assist in promoting the growth of the country's economy, hence all the levels of government at different times have policies which promote the growth and sustenance of SMEs. According to the industrial pyramid, in every economy there are only few large enterprises followed by a larger number of medium enterprises, and at the bottom there is a very large number of micro and small-scale enterprises (MSEs) In this paper, SMEs overcome the various problems and enhance their access to new technologies for increasing their competitiveness in the international market, it is imperative to give them a conducive environment, which includes formulation of appropriate national policies and programmes, building up technological capacity, knowledge flows and technology databases and finally, R&D and inter-firm linkages.

INTRODUCTION

Small- and medium-scale enterprises (SMEs) occupy an important and strategic place in economic growth and equitable development in all countries. Constituting as high as 90% of enterprises in most countries worldwide, SMEs are the driving force behind a large number of innovations and contribute to the growth of the national economy through employment creation, investments and exports. Their contribution to poverty reduction and wider distribution of wealth in developing economies cannot be underrated. Small enterprises typically make a large contribution to manufacturing employment in poor countries. However, the developmental contribution of most of them is limited to generating subsistence employment of last resort. Hence, in the face of fast labour force growth and limited employment absorption in other sectors, developing country governments have mounted efforts to improve productivity and earnings in these firms. This has spawned a plethora of policies and programmes, and an almost boundless literature documenting them.

There is a need to understand and assess the real needs of the SMEs and accordingly devise approaches that ensure their sustainable growth. The need today is also to leverage on modern technologies to harness human capabilities through the process of increased communication, cooperation and linkages, both within the enterprise as well as across enterprises and knowledge-producing organizations. The following are some of the important role played by small- scale industries in India.

EMPLOYMENT GENERATION

The basic problem that is confronting the Indian economy is increasing pressure of population on the land and the need to create massive employment opportunities. This problem is solved to larger extent by small-scale industries because small-scale industries are labour intensive in character. They generate huge number of employment opportunities. Employment generation by this sector has shown a phenomenal growth. It is a powerful tool of job creation.

MOBILISATION OF RESOURCES AND ENTREPRENEURIAL SKILL

Small-scale industries can mobilize a good amount of savings and entrepreneurial skill from rural and semi-urban areas remain untouched from the clutches of large industries and put them into productive use by investing in small-scale units. Small entrepreneurs also improve social welfare of a country by harnessing dormant, previously overlooked talent.

Thus, a huge amount of latent resources; are being mobilised by the small-scale sector for the development of the economy.

EQUITABLE DISTRIBUTION OF INCOME

Small entrepreneurs stimulate a redistribution of wealth, income and political power within societies in ways that are economically positive and without being politically disruptive.

Thus small-scale industries ensures equitable distribution of income and wealth in the Indian society which is largely characterised by more concentration of income and wealth in the organised section keeping unorganised sector undeveloped. This is mainly due to the fact that small industries are widespread as compared to large industries and are having large employment potential.

REGIONAL DISPERSAL OF INDUSTRIES

There has been massive concentration of industries in a few large cities of different states of Indian union. People migrate from rural and semi urban areas to these highly developed centres in search of employment and sometimes to earn a better living which ultimately leads to many evil consequences of over-crowding, pollution, creation of slums, etc.

PROVIDES OPPORTUNITIES FOR DEVELOPMENT OF TECHNOLOGY

Small-scale industries have tremendous capacity to generate or absorb innovations. They provide ample opportunities for the development of technology and technology in return, creates an environment conducive to the development of small units. The entrepreneurs of small units play a strategic role in commercialising new inventions and products. It also facilitates the transfer of technology from one to the other. As a result, the economy reaps the benefit of improved technology.

INDIGENISATION

Small-scale industries make better use of indigenous organisational and management capabilities by drawing on a pool of entrepreneurial talent that is limited in the early stages of economic development. They provide productive outlets for the enterprising independent people. They also provide a seed bed for entrepreneurial talent and a testing round for new ventures.

PROMOTES EXPORTS

Small-scale industries have registered a phenomenal growth in export over the years. The value of exports of products of small-scale industries has increased to Rs. 393 crores in 1973-74 to Rs. 71, 244 crores in 2002-03. This contributes about 35% India's total export. Thus they help in increasing the country's foreign exchange reserves thereby reduces the pressure on country's balance of payment.

SUPPORTS THE GROWTH OF LARGE INDUSTRIES

The small-scale industries play an important role in assisting bigger industries and projects so that the planned activity of development work is timely attended. They support the growth of large industries by providing, components, accessories and semi finished goods required by them. In fact, small industries can breath vitality into the life of large industries.

BETTER INDUSTRIAL RELATIONS

Better industrial relations between the employer and employees helps in increasing the efficiency of employees and reducing the frequency of industrial disputes. The loss of production and man-days are comparatively less in small-scale industries. There is hardly any strikes and lock out in these industries due to good employee-employer relationship.

OPPORTUNITIES & CHALLENGES FOR SMES IN INDIA

Major policy reforms aimed at substantially deregulating industrial sector and liberalizing foreign investment as well as technology imports, have been the most significant development in India since 1991. The post liberalization era in the Indian economy has enhanced opportunities and challenges for the small industries sector. The following factors – strengths coupled with opportunities work in favour of Indian SMEs

- High contribution to domestic production
- Significant export earnings
- Low investment requirements
- Operational flexibility
- Location wise mobility
- Low intensive imports
- Capacities to develop appropriate indigenous technology
- Import substitution
- Contribution towards defense production
- Technology-oriented industries
- Competitiveness in domestic and export markets

By the very nature of their operations, industrial units in the small-scale sector enjoy certain inherent advantages over their larger counterparts. The free economy ushers in accessibility to bigger markets, greater linkages for SMEs with larger companies and marketing outfits, improved manufacturing techniques and processes. Various measures adopted by Government of India, Reserve Bank of India and SIDBI have attempted to alleviate the problems of SME sector. These initiatives coupled with other developments in the economic environment will enhance the prospects of SMEs.

The SMEs in India, which constitute more than 90% of the total number of industrial enterprises and form the backbone of industrial development, continue to be in technological backwaters vis-à-vis advances in science and technology. These suffer from problems of sub optimal scales of operations and technological obsolescence. While most of the large companies, even in developing countries, have financial as well as technical capacity to identify technological sources and evaluate alternate technologies for their requirements, unfortunately, this capacity is conspicuously missing in most SMEs. It is these features of SMEs that make them an ideal target for technological up gradation through technological cooperation with larger enterprises, with R&D institutions, academic institutions and centres of technology development.

To enable SMEs to mitigate problems of technological backwardness and enhance their access to new technologies, it is imperative to give them a conducive environment, which in the present context of globalization, calls for redefining approaches with knowledge (Innovation, Technology, Entrepreneurship, Advancements in ICT) playing a predominant

104. Real Time Scheduling for Embedded System <i>Neeraj Chauhan, Ranjana Sharma and Mohan Vishal Gupta</i>	481
105. Cloud Computing <i>R. Vijaya Baskaran</i>	487
106. A Comparative Study of Automatic Face Recognition Systems <i>Anand Sharma, Pradeep Kumar Sharma, Nidhidh Singh and Lalit Mohan Gupta</i>	493
107. A Architecture of Congestion Control at Application Layer using Vehicular Ad-hoc Network <i>Anand Sharma, Malikhan Singh, Nidhish Singh and Pradeep Kumar Sharma</i>	502
108. Cryptovirology: Extortion based Security Threats and Countermeasures <i>Nidhi Mishra and Sakshi Pandey</i>	508
109. A Survey on Various Schemes for Address Assignment in MANETs <i>Shruti Saxena, Samir Srivastava, Monika Singh and Raksha Pandey</i>	513

ABSTRACTS

110. Becoming Entrepreneur by Outsourcing: A Case Study of Aligarh's Locks & Hardware Industry <i>Rohit Kumar</i>	521
111. Role of FDI in Retail Industry <i>Nipun Tyagi and Anuj Jain</i>	521
112. Estimation of Software Reliability Growth Model Parameters <i>Virender Singh, Anil Kumar and Baba Mastnath</i>	521
113. Foreign Direct Investment (FDI)—Boon or Bane in Present Financial Scenario <i>Vinod Kumar Chib</i>	522
114. Small and Medium Enterprises (SMEs)—Challenges Ahead <i>Vinod Kumar Chib</i>	522
115. Role of Media in Consumer Behaviour <i>Sumit Mukherjee and Mollshree</i>	522
116. Facial Expression Recognition <i>Arpita Nagpal and Kamal Kumar Ranga</i>	523
117. Effects of Scouring Methods on Physical Properties of Rambouillet Wool <i>Alka Goel, Rashi Agarwal and Arpan Saxena</i>	523
118. Corporate Social Responsibility <i>Divya Sharma and Kanika Tyagi</i>	523
119. Simulation based Performance Analysis of AODV and AOMDV <i>Deepchand Jaiswal</i>	524
120. Implementation of Cloud Computing for Improving the Quality of School Education in Rural Part of India <i>Gaurav Bhatia</i>	524
121. Resurging India Myths and Realities <i>Nimisha</i>	524
122. A Study of Uses of Agent based Application in Distributed and Virtual Environments <i>Rashmi Priya</i>	525
123. UID (Unique Identification Number) <i>Devna Jain and Rachit Jain</i>	525
124. Small and Medium Enterprises—The Growth Engine of India <i>Manisha Jain</i>	525

role. While we look into new approaches to strengthen them effectively, one has to understand the **limitations of SMEs** also, which are:

- Low Capital base
- Concentration of management functions in one / two persons
- Inadequate exposure to international environment
- Inability to face impact of WTO regime
- Inadequate R & D
- Lack of professionalism

Besides these, the most formidable problem gripping the SMEs has been in accessing technology and maintaining competitiveness. The reasons for the inability of SMEs to identify their technology needs appear to be:

- Poor financial situations and low levels of R&D
- Poor adaptability to changing trade trends
- Desire to avoid risk
- Non-availability of technically trained human resources
- Emphasis on production and not on production costs
- Lack of management skills
- Lack of access to technological information and consultancy services
- Isolation from technology hubs

In order to enable SMEs overcome the above problems and enhance their access to new technologies for increasing their competitiveness in the international market, it is imperative to give them a conducive environment, which includes:

- (1) Formulation of appropriate national policies and programmes;
- (2) Building up technological capacity;
- (3) Knowledge flows and technology databases;
- (4) R&D and inter firm linkages.

Networking offers an important route for individual SMEs to address their problems as well as to improve their competitive position.

RECOMMENDATIONS

Creating a Climate for Entrepreneurship

The popular misconceptions are that entrepreneurs are born, not made. In fact, entrepreneurial skills can be identified and developed. The entrepreneur is typically an innovator who formulates new solutions to existing problems, mobilizes resources and stimulates others to participate in the team. These aptitudes develop over time, often starting in childhood, as the person faces new challenges and learns from failure. Cultural differences among societies affect entrepreneurial activity. The techno-entrepreneur anywhere has the challenge of moving a concept through the prototype and production phase to meet market needs at a price consistent with the value created and with the ability of customers to pay.

Self-Help Groups

Self Help Groups (SHGs) of Women, their federations (for example, Confederation of NGOs of Rural India -CNRI) and networks are another important sector that needs support in the Eleventh Plan. The best success story is that of the Lijjat Papad. Today, their scope goes beyond Agro/ Food Processing into many electronic/ engineering activities. As articulated by CNRI, what these groups need for their success are augmented micro financing and revolving credit. The possibility of the organized sector linking up for quality and international reachability is to be encouraged.

SME Cluster Development

The importance of S&T interventions in SMEs on a cluster basis is today well appreciated internationally. As mentioned earlier, there have been many attempts for technology of duration of clusters of SMEs in India by the Ministries of Small Scale Industries, Agro & Rural Industries, and Food Processing etc. Some of the sectors like Casting, Sports Goods, Scientific Instruments, Surgical Instruments, Diesel Pump & Engineering Industry, Agricultural Implements Industry and Pottery are already identified by TIFAC & Ministry of SSI for a Mission Mode approach for technology intervention in the 11 th Plan to help increase their productivity and exports significantly. An outlay of Rs. 50 Crore is recommended for this mission mode programme for the seven selected SME clusters.

Technology Profiling of SME Clusters

A strong need for preparing sectoral technology profiles of the SMEs has been felt. These Technology profiles will help in critically examining and addressing technology needs in line with the business requirements of the respective sectors. To begin with, following, 10 SME sectors can be taken up for technology profiling:

1. Food and allied industries
2. Wood and wood products
3. Paper products
4. Leather and leather products including footwear
5. Rubber products
6. Plastic products
7. Glass and ceramics
8. Electrical machines, appliances & apparatus
9. Bicycle parts, tricycles and perambulators
10. Sports goods.

Information & Communication Technology (ICT) for SMEs

Information & Communication Technology (ICT) can play a crucial role in reshaping the business models of SMEs to strengthen their competitive performance. The application of ICT is not limited to shop floors only; it is rather widely used in non-production processes also, which are considered major source of non-price factors of competitiveness. Awareness about safety, health, ergonomics, occupational hazards and environmental issues needs a high priority and must go along with schemes and not separately. Potential of ICT can be tapped for this purpose, also as one of the methods. It is understood that Ministry of SSI is working out a programme for helping SMEs to identify their ICT needs and providing resources for its implementation. Some initial work has been taken-up jointly by Ministry and the CII with a view to enhance competitiveness of Indian SMEs.

REFERENCES

- [1] MacGillivray, A & Doane, D (2001) *Economic Sustainability: the business of staying in business*. London, SIGMA.
- [2] Raynard, P & Forstater, M (2001) *The Business Case for Sustainability*. London, SIGMA.
- [3] Walker Information (1999), *The 1999 Business Ethics Study*. Indianapolis, WalkerInformation.
- [4] Centre for Social Markets (2001) *First World Report on Corporate Social Responsibility (CSR): Internet consultation of Stakeholders*
- [5] Jenkins, R (2000) *Corporate Codes of Conduct. Self-regulation in a global economy*, UNRISD
- [6] Robins, N., Roberts, S., Abbot, J. (2000) *Who Benefits? Understanding the social impacts of environmentally-driven trade*, IIED, London.
- [7] Zadek, S & Evans, R (1993) *Auditing the Market*. Gateshead, Traidcraft/NEF
- [8] Moss-Kanter, R (1999) *From Spare Change to Real Change. The Social Sector as Beta Site for Business Innovation*. Harvard Business Review, pp 122-132, May-June.
- [9] UNIDO Business Partnership for Industrial Development, February 2002, Vienna.
- [10] UNIDO Partnership Programme: *Automotive Component Industry in India (Impact of Phase I)*, Vienna, 1999.
- [11] Malaysia, *Implementation Of The Integrated Plan Of Action For The Development Of SMEs (SPAN)*, 2005/SMEWG/026 Agenda Item: 8
- [12] PECC. *Presentation to Ministers, SMEs in APEC—Addressing Cross Cutting Issues More Effectively*, 2004/SMEMM/003 Agenda Item: 602.
- [13] Peru, *Implementation of the Strategic policy Framework and Action Plan for SME Development (SPAN)*, 2005/SMEWG/039, Item B.

Poverty and Disability among Indian Elderly: Evidence from Household Survey

Vidushi Yadav

SL, Dept. of Home Science, TMU, Moradabad

Abstract—This paper attempts to analyze the depth of poverty and examines the causal relationship between disability and poverty among Indian elderly. We use 58th round of National Sample Survey Organisation (NSSO) data surveyed in 2002. Our analysis finds higher level of poverty and income inequality among disabled elderly as compared to non-disabled elderly and those differences in the income levels vary significantly across different age groups, gender, social groups and educational status. Finally, the estimation results confirm the hypothesis of causal relationship between poverty and disability.

INTRODUCTION

With prolonged human life, reduced mortality and fertility rates, ageing has become a global phenomenon in the 21st century. World Health Organization (WHO) views ageing as a privilege and a societal achievement. This process started in developed countries and slowly shifting to developing countries like India with systematically increased in number of graying population and hence, their proportion in the total population. According to United Nations (2005) estimates, the population of the world has stood around 6.5 billion in the dawn of 21st century and is expected to rise to 9.3 billion by 2050. Also, proportion of the elderly³ to the total population is expected to increase from 10 percent in 2000 to 15 percent by 2025 and over 21 percent by 2050. The population growth trend of elderly in India is somewhat similar to the world's trend. Following Population Census of India, the population of elderly was only 24 million in 1961; increased to 43 million in 1981; to 57 million in 1991 and about 77 million in 2001. Further, their share in the total population has also risen from 5.63 percent in 1961 to 6.58 percent in 1991 (Irudya Rajan et al., 1996 and 1999) and to 7.5 percent in 2001 (Irudya Rajan, 2006 and 2008).

The linkage between ageing and disability is a biological fact where the risk of disability increases with increase in age. However, with proper policy intervention, onset of disability can be delayed. Ageing should not be treated as synonymous of disability as a large proportion of older people live with good health status and without significant mental or physical decline. This link is very important particularly for the countries like India where age-structure of the total population is still predominantly young or middle aged but the age structure of disabled persons is predominantly elderly. In India, more than one-fourth of the Indian aged population is disabled and age-specific disability rates and the severity of disablement increase with age within old age bracket. In the age-groups young-old (60-64), middle-old (65-69), older-old (70-74) and oldest old (75 and above), the percentages of disabled persons are 36, 42, 51 and 61, respectively (NSSO, 2003). The absence of a safety net for the aged has exacerbated the problem. On poverty front, it is already established in developed countries like UK that the proportion of elderly people living at or below the poverty line is very much higher than that of younger people (Townsend, 1981). It is also evident from Indian data that 40 percent of the elderly live below the poverty line and 90 percent are neither covered by any state pension nor have any family to take care of them.⁴ However, still little is known about poverty among the elderly. Government of India has some anti-poverty programs particularly for disabled people. Persons with Disabilities Act, 1995 (PWD hereafter) is one of the most important step forward in policy towards disabled people in India. However, World Bank (2007) finds some weaknesses in its design and coverage. Two important limitations are important in our context. One, the act covers only designated types of disability, which are not inclusive of several significant categories of disability (e.g. autism). Second, safety nets for PWD offer low coverage and limited financial protection, for example, the PWD act commits to reservations for PWD of not less than 3 percent in all poverty alleviation schemes, but it appears that PWD are well below 3 percent of beneficiaries in all schemes. Also, the new National Rural Employment Guarantee Act (NREGA) has dropped the provision for reservations for disabled people. According to the World Bank report ...significant categories of people who are functionally disabled will not typically be identified by households as being disabled. The primary example of this is elderly people with significant functional impairments who were not disabled before they became old. In field work, the standard answer on probing was that even seriously functionally impaired elderly people were "just old" or "like many other old people" rather than disabled.

Though literature is available on the relationship between disability and poverty, very few are focused on elderly in India (Sengupta and Agree, 2003; Prakash, 2003). Audinarayana and Sheela (2002) reveal that elderly people who belong to the higher socio-economic class were found to have lesser disabilities. Sengupta and Agree (2003) analyze covariates of mobility difficulty among the older adults in India and find that there is a substantial association between mobility and chronic diseases in the elderly. Kerketta et al. (2009) find that there is a high prevalence of physical disabilities with both non-communicable as well as communicable diseases among the elderly primitive tribal members and recommend for the implementation of a special health care strategy to reduce suffering at this crucial age and improve quality of life. In India most of the studies are either just informative or descriptive without much statistical work and therefore, of limited scope. The relationship between disability and poverty in developing countries has not been well-established in the quantitative literature (Braithwaite and Mont, 2008).

In this paper, I have tried to re-look the relationship between disability and poverty among Indian elderly. Further, paper aims to compare the poverty scenario between individuals with disability and without disability using different measures of poverty and inequality. The estimation results confirm the causal relationship between poverty and disability. However, these findings must be read with caution as later phase of life is naturally associated with high rate of disability and incidences of poverty due to retirement and out of pocket expenditures on health and other necessities.

POVERTY AND DISABILITY: A CAUSAL RELATIONSHIP

The association between poverty and disability has been well documented (U.S. Census Bureau, 2004; Wittenburg & Favreault, 2003; Elwan, 1999) in the literature. The relationship is, in general, found to be causal (Braithwaite and Mont, 2008; Lustig et al., 2007; DFID, 2000; Moore and Yeo, 2003; Yeo, 2001). It is argued that though not all disability is caused by poverty, poor people who suffer from malnutrition and in lack of adequate access to health services including maternal care and trauma services, are more likely to suffer from disability which further ensure their exclusion and marginalization of by reducing their opportunities to contribute productively to the household and to the community, which in turn increases the risk of poverty. DFID (2002) and Moore and Yeo (2003) provide specific mechanism how the vicious circle between poverty and disability exists and work. DFID (2000) describes a vicious circle and the causal link between disability and poverty suggest that in one hand the poverty increases the likelihood of injury and impairment and hence the risk of disability; on the other hand the exclusion of disability leads to greater rates of poverty. Other studies also suggest that poverty increases the risk of disability through social role devaluation (Wolfensberger, 2000), environmental risk factors (Evans, 2004; Link & Phelan, 1995), negative group influences (Durlauf, 2001), and weakened sense of coherence (Antonovsky, 1987, 1991). Recently Lustig *et al.* (2007) emphasize that poverty limits access to resources that finally leads to a chronic health problem or disability. Research shows that this vicious circle varies as well within and between cultures and contexts, but is generally acknowledged to be strong. Thus, the link between poverty and disability may be attributed to the discrimination, social exclusion and denial of rights together with lack of access to basic services.

DATA AND SAMPLE DESCRIPTION

Table 1: % Distribution of Disabled Elderly

	All	Rural	Urban
All	45.86	45.76	46.21
Age-Group(year)			
60-64	36.07	36.23	35.49
65-69	41.74	41.57	42.36
70-74	51.05	51.45	49.55
75 Plus	60.75	60.45	61.74
Gender			
Male	46.83	46.28	48.83
Female	44.94	45.25	43.86
Social Group			
ST	51.70	51.45	54.39
SC	48.91	48.81	49.39
OBC	45.90	45.87	46.06
Other	43.03	42.19	44.94
Educational Status			
Below Primary	47.52	47.27	49.27
Primary	46.56	46.56	46.57
Middle	43.25	42.60	44.99
Secondary	42.59	41.31	44.98
Higher	42.88	41.89	43.79

The paper is based on micro-level 58th round of National Sample Survey Organization (NSSO) data collected during July 2002 to December 2002. The survey period was divided into two sub-rounds of three months duration each. Equal number of sample first stage units was allocated to each of these sub-rounds with a view to ensuring uniform spread of the interviews over the entire survey period. A stratified multi-stage sample design was adopted for the 58th round. The number of sample villages and urban blocks surveyed in central sample was 4637 and 3354, respectively. Percentage distribution of disabled elderly according to their age group, sex, social status and education are shown in Table 1. It can be observed that about 46% of the elderly suffer from at least one kind of disability. However, the share of disabled elderly is little higher in urban India and this may be attributed to the fact that the likelihood of disability detection is higher in urban areas due to better health care facilities. Also, it is evident that with increase in age, the share of disabled elderly increases in both rural and urban areas. While only 36% of elderly are suffering from disability in the age-group 60-64, it becomes 42% in age bracket 65-69; 51% in 70-74 and about 61% in the age group 75+ years. The same trend exists in both rural and urban areas. Further, in the same line with individuals of all ages, the share of male elderly is higher than that of female elderly in the old age population.

However, while more elderly reports for disability in urban India as compared to rural India (49% and 46%, respectively); the reverse is true in case of female elderly (44% and 45%, respectively for urban and rural areas).

Now, turning to social group wise distribution of disabled elderly in India, we find that the percentages of Scheduled Tribes elderly are the most disabled among all social classes in India. Scheduled caste elderly comes next followed by other backward castes and other castes. While nearly 52% of ST elderly have at least one disability, the percentage goes down to 49% in case of SC elderly. The proportion of OBC and other castes are 46% and 43%, respectively. Here also, Table 1 suggests that more disability live in urban areas as compared to rural part of the country. Furthermore, as expected most of disabled elderly are illiterate too. Table 1 indicates that among illiterate elderly, 48% suffer from disability. This figure reduced with 47% among elderly with primary education and about 43% who are educated with middle and high level.

CONCLUDING OBSERVATIONS

The relation between poverty and disability is commonly accepted as a vicious circle and it is widely hypothesised that it is a two way relationship i.e. disability increases the risk of poverty and conditions of poverty increase the risk of disability. The objective of this analysis was mainly to understand the relationship between poverty and disability in the elderly population of India. Based on different indices of poverty and inequality, our analysis suggests that as compared to non-disabled elderly, the poverty and income inequality level is higher for disabled elderly. In conclusion, if our analysis has any validity, it has far many policy implications. There is immediate need to strengthen social security safety nets to uplift poor elderly's economic conditions in one hand and on the other hand, it is also essential to provide sufficient health care facilities to reduce the risk of disability among elderly.

REFERENCES

- Antonovsky, A. (1991): *The Structural Sources of Salutogenic Strengths*, in C.L. Cooper & R. Payne (Eds.), *Personality and Stress: Individual Differences in the Stress Process* (pp. 67-104). Chichester, UK: Wiley.
- Audinarayana and J. Sheela (2002): *Physical Disability among the Elderly in Tamil Nadu: Patterns, Differentials and Determinants*, *Health and Population - Perspectives and Issues*, 25(1):26-37.
- Braithwaite, J. and D. Mont (2008): *Disability and Poverty: A Survey of World Bank Poverty Assessments and Implications*, February 2008.
- Deaton, A. and C. Paxson (1995): *Measuring Poverty among the Elderly*, NBER Working Paper, National Bureau of Economic Research, Inc.
- Deaton, A. and C. Paxson (1998): *Economies of Scale, Household Size, and the Demand for Food*, *Journal of Political Economy*, 106 (5).
- DFID (2000): *Disability, Poverty and Development*, Department for International Development, London www.dfid.gov.uk
- Dreze, J. and P.V. Srinivasan (1997): *Widowhood and poverty in rural India: Some inferences from household survey data*, *Journal of Development Economics*, Vol. 54, 217-234.
- Durlauf, S. (2001): *A Framework for the Study of Individual Behavior and Social Interactions*, *Sociological Methodology*, 31: 47-87.
- Elwan, A. (1999) *Poverty and Disability: A Survey of the Literature* World Bank, Washington, USA
- Evans, G. (2004): *The environment of childhood poverty*, *The American Psychologist*, 59, 2, 77-92.
- Foster, J., J. Greer, and E. Thorbecke (1984): *A Class of Decomposable Poverty Measures*, *Econometrica*, 52:761-766.
- Himanshu (2007): *Recent Trends in Poverty and Inequality: Some Preliminary Results*, *Economic and Political Weekly*, February 10, 2007, 497-508.
- Irodya Rajan, S, U.S. Mishra and P.S. Sharma (1996): *India: National Aging Trends*, In United Nations, *Life Long Preparation for Old Age in Asia and the Pacific*, United Nations, New York. ST/ESCAP/1684, 79-104.
- Irodya Rajan, S, U.S. Mishra and P.S. Sharma (1999): *India's Elderly: Burden or Challenge?* Sage Publications, New Delhi and Thousand Oaks, London.
- Irodya Rajan, S. (2006): *Population Ageing and Health in India*, Centre for Enquiry into Health and Allied Themes, Survey No. 2804 and 2805, Mumbai.
- Irodya Rajan, S. (2008): *Social Security for the Elderly: Experiences from South Asia*, (ed.), Routledge: Taylor and Francis Group: London, New York, New Delhi.
- Kerketta, A.S., G. Bulliyya, B.V. Babu, S.S. S. Mohapatra and R. N. Nayak (2009): *Health Status of the Elderly Population among Four Primitive Tribes of Orissa, India: A Clinico-Epidemiological Study*, *Zeitschrift für Gerontologie und Geriatrie*, 42 (1) / February, 2009.
- Link, B., and Phelan, J. (1995). *Social Conditions as Fundamental Causes of Disease*, *Journal of Health and Social Behavior*, 35 (Suppl.): 80-94.
- Lustig, D.C. and D.R. Strauser (2007): *Causal Relationships between Poverty and Disability*, *Rehabilitation Counseling Bulletin*.
- Moore, K. and R. Yeo, and (2003): *Including Disabled People in Poverty Reduction Work: Nothing about Us, Without Us*, *World Development*, Vol. 31, No. 3 pp.571-590, 2003.
- NSSO (2003): *Disabled Persons in India*, National Sample Survey Organization 58th Round, Ministry of Statistics and Programme Implementation, Government of India.
- Pal, S. and R. Palacios (2008): *Understanding Poverty among the Elderly in India: Implications for Social Pension Policy*, IZA Discussion Paper No. 3431, April, 2008.
- Prakash J. (2003): *Aging, Disability, and Disabled Older People in India*, *J Aging Soc Policy*, 2003; 15(2-3):85-108.
- Sengupta, M. and E.M. Agree, (2003): *Gender, Health, Marriage and Mobility Difficulty among Older Adults in India*, *Asia-Pacific Population Journal*, December 2003, 53:65.
- Stern, S. (1989): *Measuring the Effect of Disability on Labour Force Participation*, *Journal of Human Resources*, 24, 361-395.
- Townsend, P. (1975): *Poverty and Disability*, London: Disability Alliance.
- U.S. Census Bureau. (2004): *Survey of Income and Program Participation 1991*, Retrieved February 2, 2005, <http://www.census.gov/population/pop-profile/disability>.
- United Nations (2005): *World Population Prospects: The 2004, Revision, Vol. I Comprehensive Tables, and Vol. II, Sex and Age Distribution of the World Population*, Sales No.E.05.XIII.Sand E.05.XIII.6.
- Wittenburg, D., and M. Favreault (2003): *Safety Net or Tangled Web? An Overview of Programs and Services for Adults with Disabilities*, Occasional Paper Number 68. Washington, DC: Urban Institute. Retrieved February 19, 2007, from http://www.urban.org/uploadedpdf/310884_OP68.pdf.
- Wolfensberger, W. (2000): *A Brief Overview of Social Role Valorization*, *Mental Retardation*, 38, 105-122.
- World Bank (2007): *People With Disabilities In India: From Commitments to Outcomes*, Human Development Unit, South Asia Region, World Bank.
- Yeo, R. (2005): *Disability, Poverty and the New Development Agenda: A Report to the KaR Programme*.

Study of the Working Behaviour of Unorganized Service Sector in the Middle Size Towns with Special Reference to Jabalpur

Uma V.P. Shrivastava¹ and Jeetendra N. Mulikar²

¹Reader, Department of Business Administration, Hitkarini

College of Engineering and Technology, Jabalpur, M.P.

²Research Scholar, R.D.V.V., Jabalpur

Abstract—With the changes in the work culture and life style of the people in metros, class one towns and middle size towns the assistance of the unorganized service sector personnel's have grown intensively. Researches have indicated that, with noticeable increase in the number of workingwoman there has been a corresponding increase in the requirement of baby-sitters, house-maids, drivers, gardeners, washer man/ woman, electricians, plumbers etc. This study has been done to understand the perception and relative behaviour of these agents regarding their work.

Keywords: Unorganized service sector, working people's problem, Unprecedented Domestic Worker Behaviour.

INTRODUCTION

Bulk of India's workforce is unorganized in nature. The unorganized sector is a critical part of the Indian economy. Prior to understanding the human resource and skill requirements in the unorganized sector, it is required to put in perspective the usage of the terms 'unorganized / informal sector' and 'unorganized/ informal employment'.

The unorganized sector consists of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than ten total workers.

Unorganized workers consist of those working in the unorganized enterprises or households, excluding regular workers with social security benefits, and the workers in the formal sector without any employment/ social security benefits provided by the employers.

It is critical to note that unorganized / informal employment is characterized by lack of social sector benefits. It is also important to note that though employment might take place in a formal / unorganized sector, the 'nature' of employment could still be "informal / unorganized".

The total employment in the unorganized sector in India is expected to be about 467 million (93%) out of a total workforce of 503 million in 2011. The extent of informal employment is estimated to be at about 93%-95% between 2009 and 2010. As is obvious, this not only indicates the importance of informal sectors but also indicates the importance of informal employment, and the need for skill building therein. The National Commission for Enterprises in the Unorganized Sector (NCEUS) has extensively profiled the unorganized sector and unorganized employment in its report, 'The Challenge of Employment in India – An Informal Economy Perspective' (April, 2010 and June 2011). Human Resource and Skill Requirements of the Unorganized Sector.

Table 1: Growth Rate in Employment (In Percent over Previous Year)Year

	Organized	Unorganized	Total
2006	2.25	3.05	5.3
2007	2.26	3.43	5.69
2008	2.26	3.27	5.53
2009	2.11	3.51	5.62
2010	2.09	3.77	5.86
2011	2.12	3.83	5.97

Source: Annual report of Employment review (2005-2011)

DOMESTIC WORKERS

With the changes in the work culture and life style of the people in metros, class one town and middle size towns, the assistance of the unorganized service sector personnel's have grown intensively. Researchers have indicated that, with noticeable increase in the number of workingwoman there has been a corresponding increase in the requirement of baby-sitters, house-maids, washer man / woman, electricians, plumbers etc.

Domestic Workers is an important constituent of employment in the country, especially in the urban areas. Several reasons such as changes in the structure of the Indian Economy, increasing household annual income, increasing urbanization and thus changing lifestyles, and changing demographic profiles of the country can be attributed to this rising demand. This study has been done to understand the domestic workers perception, details and relative behaviour of these agents regarding their work.

Domestic workers have been classified on the basis of their working manner.

LIVE-IN DOMESTIC WORKERS

Live-in domestic workers reside at the place of employment. They are engaged in all domestic work ranging from housekeeping, washing clothes, utensils, cooking and as the case maybe baby, children or elderly care. They depend on their employers for basic needs such as food and shelter. Most live-in are woman who have migrated or have been moved from villages to cities in search of employment. They are to large extent teenagers, unmarried and sometimes married young girls separated or widowed women.

PART-TIME/LIVE-OUT DOMESTIC WORKERS

Part-time/Live-out domestic workers are generally locals or migrants in the city where they are employed. They mostly live in slums and work in different houses of employers to earn their livelihood. They are called part timers/live-outs not because they do only part time work but because they do not stay with the employer and are not generally on call 24 hours a day. They either work all day for one employer or repeatedly perform specific tasks like washing clothes, dishes, or cooking for a number of employers. Part-timers are less dependent on their employers than full timers. They live with their families, thereby in effect, run their homes, as well as those of their employers. However, they are less dependent on their employers for their basic needs and are characterized with a greater degree of independence than the live-ins.

LITERATURE REVIEW

Reading material from the earlier works done on the relevant subject supported the study. This included the works done by the references mentioned; research study done by Dr.Gupta R.K. (2006) for his doctorate on this subject and other study material from the University of Jabalpur (R.D.V.V.).

- Sahay, R.N. and Dubey, P: "Working Behaviour of the Domestic Workers in the changing career culture", *Journal of Behavioral Sciences and Applied Economics* 38,2 (2009); mentions about the changes seen in the basic working behaviour of the domestic workers specially referring to their irresponsible behaviour regarding uninformed offs and casual approach towards answerability towards the allotted work.
- Giri, N.K. and Venkatraman, P.S.R: "Domestic Workers and their business operations", *The Management Review*, 27-256-289. The paper discusses about the reasons of the workers getting into this category of work and their operational efficiencies.
- Khan Md.Z.K. (2008) – "Domestic Workers in the Unorganized Sector with special reference to Urban Towns" – *Mekal Management*. The research paper categorically talks about the specific specialization that the workers gain due to working only on one kind of job. They also discuss about the security hazards and the problems created due to lack of awareness and the indifferent attitude people have about hiring domestic workers.
- Gupta S.K. and Verma N.K. (2010) – "Growth of Indian Unorganized Service Sector" – *Management Peer*. Gupta and Verma detail about the reasons and characteristics leading to the growth of this sector. They also focus on the consistent growth the sector has been showing over the decade and the growing need of the domestic workers.
- Sakthivel and Joddar (2010)–"Unorganized Sector Workforce in India – Trends, Patterns and Social Security Coverage – *Economic Review Journal*. The authors have worked majorly on the security aspects related to domestic workers. They have supported with lots of examples and data the fact that the registration of the domestic workers with the authority is a must; as it is related to the security aspect of the entire family and the society as a whole. They also narrate that; the unregistered workers in not of the right streams, can be identified by their operating patterns.
- Human Resource and Skill Requirements in the Unorganized Sector Report (2009 -10) - NUWSDC

PURPOSE OF STUDY

The working style of the domestic workers is very typical and almost the same in all the parts in our country. The basic purpose of study has been as follows:

1. To understand the working pattern of the domestic workers.
2. To understand their unpredictable working behaviour.
3. To understand the seriousness of these workers about their work.
4. To gauge the factors of loyalty, honesty and hard work etc.

SAMPLE AND METHODOLOGY

As a part of our study, we interacted with employers (67) who employ domestic workers at their own homes and as well as domestic workers (192) to understand various aspects, such as the profile of the persons employed in the segment, issues faced by the employers in terms of skill gaps in domestic workers, benefits received by domestic workers etc. These domestic workers are in the age group from < 20 years to > 50 years but in varying percentages, both males and females, as further mentioned in the study details. The data collected is primary and is supported by the secondary data as required. In sample respondents include both the live-out and live-in domestic workers.

UNDERSTANDING OF STUDY

Domestic Workers in India can be classified as Live-Out domestic workers (those who stay at their own homes and work at multiple households during the day) or Live-in domestic workers (those workers who stay at the homes of their employers and are thus typically employed at a single household).

Domestic workers, especially women domestic workers, are a constantly growing section of workers in the informal sector in urban India. Last two decades has seen a sharp increase in their numbers, especially in contrast to male domestic workers. This is largely related to the increase of women in the urban labour force and the availability of cheap labour. Research has shown that work in the informal sector, including domestic work, provides options for survival for these women.

The profile of domestic workers in research area of Jabalpur specifies that, the majority of the domestic workers are females in the age group of 21 yrs to 30 yrs who are at the most primary passed and having varying work experiences. These workers have various reasons for working and are employed most of the time as a result of the reference given by another worker.

Table 2: General Profile of Domestic Workers

1	Gender	Female	Male			
		81%	19%			
2	Age (in years)	> 20	21 - 30	31 - 40	41 - 50	> 50
		9%	59%	17%	9%	6%
3	Educational Qualification	Primary	Middle	High School	Higher Secondary	
		51%	26%	19%	4%	
4	Work Experience	< 6 months	6 months - 2 yrs	2 - 5 yrs	> 5 yrs	
		16%	23%	29%	32%	
5	Reason of work	Increase disposable income	Family recommendation	Financial support		
		25%	4%	71%		

Source: Primary data from the city of Jabalpur

Domestic workers can be divided on the basis of the various category of work they undertake. The most popular and varied category in the city includes cook, house keeper, baby sitter, utensil cleaner, washer man, gardener, driver etc.

During the study it has been understood that, in most of the cases the female domestic workers are required to work to help increase the disposable income of the family since the bread earner is not able to meet the requirements. Thus, a major reason is to provide financial assistance to the family. The females resort to domestic work since they are not literate and / or qualified enough to undertake any other kind of skilled work. In some of the cases the reasons are that, due to the incapability of the male in the family to support the family or in cases of the male having moved out leaving the family, the female has to undertake domestic work for survival of herself and her kids. Male domestic workers in 80% of the cases are workers who have been doing a particular job from ancestors time for eg: male cooks, washer men etc. Males are also predominantly preferred for works which demand higher labour, strength and odd working hours for eg: gardener, drivers etc.

In the past one and a half decade, there has been a consistent growth in the number of working ladies. This has lead to the need of domestic workers specially baby sitters, housekeepers, cooks and drivers. The working pattern of the domestic workers largely depends on the monthly earnings that they are receiving. A live out domestic worker earns an average of two thousand per month including the category of utensil cleaner, washer man, gardener, miscellaneous cleaning maid etc. The reason is that these people work for various households and charge majorly on the basis of head count per house, for eg: a washer man would charge an average of one hundred rupees per head per month. Thus his earnings would vary; if he is working in six houses each having an average four members, he would earn about two thousand four hundred rupees per month. Similarly a gardener can work in many houses at the same time on weekly, fortnightly or monthly basis and earn a different amount from every house depending on the type of work and labour involved.

The category of baby sitters, housekeepers, cooks and drivers includes a whole day involvement and therefore these people cannot work in multiple places. This further means that, all the money they need as income has to be generated from one single household whether it is live-out or live-in kind of work, and therefore the remuneration of this category is higher than the live-out multi place workers. These categories earn an average of four thousand rupees per month.

Although these workers in middle size towns do not come under any union or do not follow any legal norms of working, but in metros like Mumbai and Delhi, union does exist and they are governed by the rules and norms of these unions.

Another finding during this study which was accepted by the various employers as a major issue during the course of discussion has been that, workers in all the categories have an consistent habit of taking leaves/ offs for no major reasons without prior information and intimation. This actually hampers the scheduling of the employers for the whole day and

also leads to delay and unplanned working. This kind of leave taking also leads to lots of unanticipated problems and mismanagements for the employers. When discussed about this with the workers a few points were understood about their behaviour and thought process. Firstly, workers have a long chain of relations which are the fall back factor in view of poverty and job uncertainty. Since they need each other's help and support they wish to maintain and sustain the relationships. Thus, they are required to take leaves, when they have to rush help and support to the counterpart or attend functions at their places basically for social networking reasons. Secondly, the workers in majority of cases live in areas which are damp and lack proper water, drainage and light facility. This leads to ill health resulting in leaves. The argument is that, their budget permits only this kind of habitation and a better surrounding than this is not possible. Earlier researches have mentioned that, these kinds of habitation leads to ailments of various kinds and thus there is consistent leave taking by these workers. Another interesting finding has been that, these workers do not lead a life like a middle class citizen who keeps worrying about his future all the time and forgets to live his present. They live and enjoy their lives as it comes and thus on days when they do not wish to go for work or they want to relax, or go places for fun they take leave without hesitation. Deduction of salary also does not mean too much sometimes as quoted by one of the worker respondent, "if the salary is deducted we would take up an additional household to work and compensate, there is not dearth of work for people wanting to work" (this was in Hindi).

Another issue of concern during the study has been about the factors of trust, punctuality multi-tasking, hygiene, attentive working, general understanding etc. These factors were major points of concern for the employers because they at times are required leaving the entire house and the dependent members of the family to attend and be taken care of by these workers. Under such a situation, if the worker is not trust worthy or punctual etc., it becomes a major problem for the employer. During the study with a view to provide the preference of employers on key characteristics of domestic workers, employers were asked to indicate the key attributes they look for when searching for domestic workers.

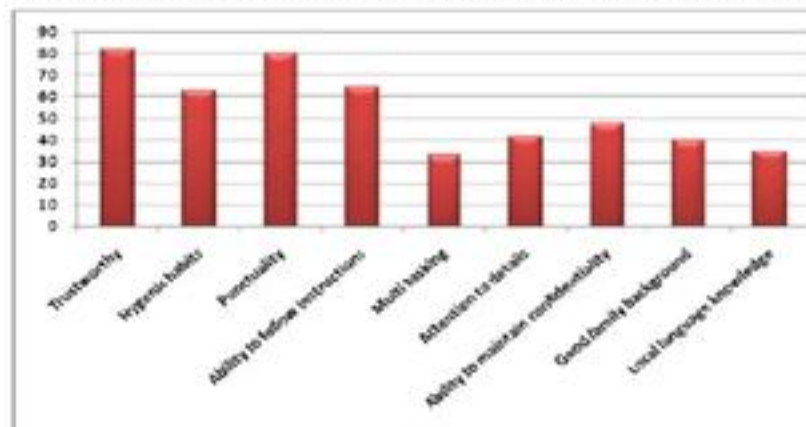


Fig. 1: Primary Information–Overlapping Percentage

Unorganized service sector is a fast growing aspect of the society. Domestic workers of various types are becoming a choice of every household including houses having both the working and non-working ladies. Domestic workers have a realization that they are a need of the household and thus have their own tantrums. Seriousness in terms of job is low since they know and believe that, they would be able to get a new work very fast if an existing one is lost.

ASPECT OF CHILD LABOUR

It was also seen during the study that, domestic workers indirectly lead to child labour problems also. Many child domestic workers are brought from villages to work in large cities such as Mumbai, Delhi, Lucknow, Chennai, and Hyderabad. Children from impoverished rural families are sent to live in the houses, with the hope that they will be looked after as their 'own' children. Some begin their working lives in debt to the employer who had paid an advance to the family member or to the recruiter. Middlemen seek out and recruit village girls to work in city houses. Families in the slums of cities send their children to work as domestics.

Some part-time domestic workers bring their children to their jobs so they can help them complete tasks more efficiently. Of the total respondents, in case of 53% respondents, employed in a household, carry their minor kids to the workplace and thus at times, either out of fun or as assistance, use them as work support, which leads to indirect child labour. Earlier research reports mention that, in 63% to 72% cases this child labour comes to full workers category by the age of 14 – 15 yrs, including both male and female child.

ASPECT OF CRIME

Another issue which was discussed during the research has been that, the employers look forward to known or acquainted workers through recommendation, due to increase in crime by domestic workers. Since the domestic workers have a thorough access to the people and things in the house, the induction of crime is higher. This has been a matter of serious

concern and since the domestic workers fall into the category of unorganized service sector it is at times difficult to trace and find out the details and whereabouts of such workers. The law recommends that, in case of hiring the domestic worker, the household should ensure to inform the local police station about the workers details along with his / her photographs. In most of the cases this is not done which leads to problems and mishaps at times.

DOMESTIC WORKERS MOVEMENT/ UNION

In the majority of towns in the country there are various NGO's and other organizations working consistently with and for the domestic workers and their benefits. One such organization hails from Mumbai - National Domestic Workers Movement (NDWM). Domestic workers are not yet integrated into the Indian society. The organization believes and works on the following basis:

1. By establishing personal contacts, Domestic Workers begin to feel more accepted and treated with dignity.
2. Domestic Workers are organized and empowered.
3. The Movement is actively involved in lobbying and campaigning for domestic workers' rights and justice as workers.
4. Information sessions are given on various topics and Domestic Workers are supported in their day-to-day problems at their workplace and at home.
5. Awareness is created about the risks implied with migrating to bigger cities or foreign countries.
6. Through awareness campaigns, advocacy and lobbying push-factors leading to migration are reduced.

Networks with organizations like UNICEF, ILO, YUVA, CCVC, AMC, GAATW, Anti-Slavery International, Human Rights – Asia, Community Centers and Welfare Agencies at both national and international levels is established to work together towards the rights and justice for Domestic Workers.

KEY FINDINGS

1. Domestic workers work only as per their requirement of the present time.
2. There is no future planning by these domestic workers.
3. They believe more in living a free life without any commitment.
4. Only 15% to 18% domestic workers work with the sense of commitment and responsibility and prefer working regularly rather than on adhoc or requirement basis.
5. Salary deduction is no solution to create any sense of responsibility.
6. Domestic workers have a realization that they are a need of the household and thus have their own tantrums.
7. Seriousness in terms of job is low since they know and believe that; one job lost would lead to getting another job, without much hassle.
8. The ethical factor is slightly difficult to find in the current trend of domestic workers.
9. Finding worker is not very difficult but every city has its own rate chart to be catered to find semi skilled (eg: washer man, utensil cleaner etc) and skilled workers (eg: cook, driver etc.).
10. Consistent work life balance by both the employer and the employee would lead to development of ethical factors and sustenance of the worker.

CONCLUSION

This study has lead to an insight in to the working pattern, seriousness and effectiveness of hiring a domestic worker. The study has been in a middle size town and thus the findings and details found have been of a different nature; whereas the study would lead to different findings and details if conducted in a metro. This is because the life style and work culture both differ with the change in the class of town and the SEC residing there.

The author of this paper has conducted the entire study and for any further data or details, the readers can revert to the author. It is expected that the study would be of utility to many more researchers.

REFERENCES

- [1] Bhalla, Shielia (2003): 'The Restructuring of the Unorganized Sector in India', Report on the Planning Commission Scheme of Socio-Economic Research, Institute for Human Development, New Delhi.
- [2] Fine, Ben (2006): 'Privatization: Theory with Lessons on contemporary Economic Theory with reference to the unorganized service sector' Macmillan, pp 41-66.
- [3] International Labour Organization (2007): Economic Security for a Better Working-Unorganized Service Sector, International Labour Review
- [4] Mitra, Arup (2003): 'Employment in the Informal Sector in India-Perspectives and Policies', Institute for Human Development, New Delhi.
- [5] Sastry, N S (2004): 'Estimating Informal Employment and Poverty in India', Discussion Paper Series-7, UNDP, India.
- [6] Satpathy, Anoop (2004): 'Size Composition and Characteristics of Informal Sector in India', NLI Research Studies, Noida.

Resurging India—Myths & Realities

125. Role of Small and Medium Enterprises in the Economic Development of India <i>Manoranjan Pandey</i>	526
126. Security Requirements and Solution for Vehicular Ad-Hoc Networks <i>Virender Singh, Anil Kumar and Kuldep</i>	526
127. Role of FDI in Indian Economy <i>Suman</i>	526
128. Corporate Social Responsibility-Different Fabrics <i>Richa Manocha and Hareem Tariq</i>	527
129. RTI in Corporate Governance—Myths and Realities <i>Prachi Saxena</i>	527
130. Ad-Hoc Network <i>Aarti Nandwani</i>	527
131. Analysis of Customer Attitude towards e-Shopping with Special Reference to Allahabad <i>Devesh Ranjan Tripathi</i>	528
132. Microfinance Bank-SHG Linkage and Women Empowerment: The Success Stories <i>Arpita Sharma</i>	528
AUTHOR INDEX	529

Understanding the Requirement of Emotional Intelligence in the Organizations/ Workplaces: An Empirical Study

Vibhor Jain¹ and Smrita Jain²

¹Lecturer, CMCA, TMU

²Asst. Prof., Moradabad Institute of Technology, Moradabad

Abstract—This paper represents ideology and empirical evidence in support of emotional intelligence (EI) and its claimed role in the current working environment. Consideration is given to the purported status of EI in occupational (with particular emphasis on personnel selection and placement) job performance, and satisfaction. Overall, this review demonstrates that recent research has made important strides towards understanding the usefulness of EI in the organizations/workplaces.

Keywords: Emotional intelligence, job performance, satisfaction

INTRODUCTION

Emotional intelligence (EI) is a relatively new and growing area of behavioral research, having caught the imagination of the general public, the commercial world, and the scientific community. Although Thorndike (1921), Guilford (1956), and later, Gardner's (1983) research into social intelligence hints at the importance of emotions to intellectual functioning, the term EI was not brought into mainstream psychology until the 1990s (Mayer & Salovey, 1990). Currently, Mayer, Salovey, and colleagues argue that EI incorporates a set of conceptually related psychological processes involving the processing of affective information (see Mayer & Geher, 1996; Mayer & Salovey, 1997; Salovey & Mayer, 1990, 1994).

The current paper provides a critical analysis of the claimed role of emotional intelligence in the occupational environment. Following a brief overview of the conceptualisation and measurement of EI, consideration is given to an emerging literature that promotes the assessment, training, and the individual's utilisation of emotional intelligence in the workplace.

EMOTIONAL INTELLIGENCE: CONCEPTS

Popular interest in EI has, at times, tended to obscure definitional clarity (Matthews, Zeidner, & Roberts, 2002). The emerging literature on EI contains disparate terminology, including not only *emotional intelligence* (Goleman, 1995; Salovey & Mayer, 1990), but also *emotional literacy* (Cooper & Sawaf, 1997), *emotional quotient* (Cooper, 1997), and *personal intelligences* (Gardner, 1983). To further complicate the situation, the sub-components of EI are variously referred to as "branches" (Mayer & Salovey, 2000)

DEFINITIONS OF EI

No matter what its hue, the aforementioned proponents all lay claim to the fact that their concept constitutes a generalized, far-reaching intelligence covering an array of emotional functions. Unfortunately, thus used, the term too often appears all encompassing and protean, such that EI is left bereft of conceptual meaning. For example, the populist, though widely influential account offered by Goleman (1995) appears to define EI by exclusion: as *any* desirable feature of personal character not represented by cognitive intelligence. More recently, Goleman (1998, 2001, see also Goleman 2000) suggests that two domain facets define the competencies associated with EI: (a) *ability*—awareness versus management of emotion, and (b) *target*—whether competence relates to self versus others. The Cartesian product of these two facets (i.e. ability by target) yields the following four components: (a) awareness of emotions in self; (b) awareness of emotions in others; (c) management of emotions in self; and (d) management of emotions in others. However, although this analysis suggests some fields of inquiry, it does not identify a unifying common element to the different components.

Perhaps the most widely accepted scientific definition of EI is "the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and actions" (Salovey & Mayer, 1990). This definition identifies emotional information processing as a necessary precursor of emotional regulation, and as we have argued elsewhere, probably constitutes the most workable contemporary definition of EI (see Matthews et al., 2002).

EMOTIONAL COMPETENCIES

Another approach, sharing more in common with "mixed models" but moving beyond a rigid conceptualisation of EI, advocates differentiation between emotional intelligence (a dispositional aptitude) and emotional *competencies* (learned capabilities) (Goleman, 2001). Based on a host of case studies, anecdotal accounts, and evaluation studies, Goleman (1998) concludes that the major qualities differentiating successful from unsuccessful executives are the competencies underlying (or presumably nested within) EI. Failing executives, apparently, have poorer emotional control, despite strengths in cognitive abilities and technical expertise.

Under this formulation, EI encompasses such characteristics as motives, traits, and aspects of one's self-image. In short, EI designates the potential to become skilled at learning certain emotional responses. By contrast, emotional *competencies* are learned capabilities, based on EI, that result in outstanding performance at work (Goleman, 2001). Akin to the distinction between *fluid* and *crystallised* ability (cf. Matthews et al., 2002), EI (as a fluid ability) does not guarantee that individuals will actually manifest competent behaviors at the workplace. That is, there is no guarantee that the individual has been exposed to essential environmental experiences or learning situations and practices necessary to acquire specific emotional competencies or skills (e.g. assertiveness, service orientation, initiative).

Emotional self-awareness. This competence includes identification of emotion and understanding how emotions are related to one's goal, thoughts, behaviors, and accomplishments (Goleman, 1998).

Regulation of emotions in the self. This competence involves intentionally eliciting and sustaining pleasant and unpleasant emotions when considered appropriate, effectively channeling negative affect, and restraining negative emotional outbursts and impulses (Goleman, 1998).

Social awareness of emotions and empathy, which includes awareness of others' feelings, needs, and concerns, understanding and sympathizing with others' emotions, and responding to others' unspoken feelings (Goleman, 1998; cf. Salovey & Mayer, 1990)

Regulating emotions in others. This competence incorporates influencing others, effectively communicating with others, and managing conflicts (Weisinger, 1998).

Motivational tendencies, which include such components as internal strivings, attributions, and need for achievement (Cooper & Sawaf, 1997; Goleman, 1998).

EI AND OCCUPATIONAL ASSESSMENT, SELECTION, AND PLACEMENT

Recently, the use of EI measures for career selection and placement purposes has begun to gather momentum in many organizations in the Western world. Thus, more and more companies are realising that EI skills may be a vital component of any organization's management philosophy (and subsequent success). A survey of benchmark practices among major corporations found that four out of five companies are now trying to promote EI in their organisations. The concept of EI is thought to be useful when evaluating ongoing functioning and the well-being of employees at critical stages of their careers (i.e. selection, training, placement, and promotion). As one group of writers has argued: "If the driving force of intelligence in twentieth century business has been IQ, then... in the dawning twenty-first century it will be EQ" (Cooper & Sawaf, 1997, p. xxvii).

OVERVIEW

Gowing (2001) traces the roots of EI in organizational settings to classic management theory and practice. Indeed, many of the strategies used in early assessment centers evaluated non-cognitive abilities akin to EI (e.g. social awareness, understanding others, communication). These abilities were found to be predictive of successful performance in managerial positions in many corporations. Furthermore, over three decades of psychological assessment research has vindicated the importance of taking social and emotional competencies into consideration when attempting to predict occupational effectiveness. In a now classic study, identified a number of personal characteristics discriminating more from less successful general managers, including such social-emotional competencies as optimism, communication and relationship skills, and need for achievement. Furthermore, research by has identified a number of social competencies (i.e. socialized power, self-esteem, positiveness) that appear predictive of future managerial success.

THE DIRECT EFFECT OF EI IN THE ORGANIZATIONS/WORKPLACE

First, more emotionally intelligent individuals presumably succeed at communicating their ideas, goals, and intentions in interesting and assertive ways, thus making others feel better suited to the occupational environment (Goleman, 1998). Second, EI may be related to the social skills needed for teamwork, with high EI individuals particularly adept at designing projects that involve infusing products with feelings and aesthetics (Mayer & Salovey, 1997). Third, organizational leaders who are high on EI, in concert with a supportive organizational climate and the human resources team, may affect the relationship in the work setting, which, in turn, impacts upon group and individual EI and organizational commitment. Finally, EI is claimed to influence one's ability to succeed in coping with environmental demands and pressures, clearly an important set of behaviors to harness under stressful work conditions.

SUMMARY

Overall, this section of our review suggests that the current excitement surrounding the potential benefits from the use of EI in the workplace may be premature or even misplaced. Whereas EI appears related to performance and affective outcomes, the evidence for performance is very limited and often contradictory. Much of the predictive validity of questionnaire measures of EI may be a product of their overlap with standard personality factors. Furthermore, the literature is replete with unsubstantiated generalizations, with much of the existing evidence bearing on the role of EI in

occupational success either anecdotal or impressionistic and /or based on unpublished or in-house research. Thus, a number of basic questions still loom large: Do emotionally intelligent employees produce greater profits for the organisation? Does EI enhance well-being at the workplace? Are the effects of training in EI likely to result in increases in job performance and/or work satisfaction?

GUIDELINES FOR FUTURE DEVELOPMENT AND USAGE OF EI MEASURES IN OCCUPATIONAL SETTINGS

Ideally, the standards for developing EI measures to be used for selection in an organisation should be similar to those of other selection predictors. In this respect, in defence of EI, not all of the most valid predictors are theoretically based. They evolve from job analyses and are subsequently shown to be valid predictors of criteria. This process is not necessarily desirable, but certainly represents something that is not uncommon in the literature.

CONCLUSION

Despite the important role attributed to a wide array of emotional competencies in the workplace, there is currently only a modicum of research supporting the meaningful role attributed to EI (and nested emotional competencies) in determining occupational success. Many of the popular claims presented in the literature regarding the role of EI in determining work success and well-being are rather misleading in that they seem to present scientific studies supporting their claims, while in fact failing to do so. In short, despite some rather fantastic claims to the contrary, the guiding principle appears presently as "caveat emptor".

Furthermore, EI measures should be used in occupational contexts only if the instruments are specifically developed, normed, and validated to that end, and demonstrate adequate occupational relevance. In sum, while the jury is still out on the utility of EI for occupational selection and performance it would appear rash to dismiss the potential value and importance of EI in all occupational settings.

REFERENCES

- [1] Bachman, J., Stein, S., Campbell, K., & Sitarenios, G. (2000). Emotional intelligence in the collection of debt. *International Journal of Selection and Assessment*, 8, 176–182.
- [2] Goleman, D., & Rhee, K. (2000). Clustering competence in Emotional Intelligence: Insights from the emotional competence inventory. 343–362.
- [3] San Francisco: Jossey-Bass. Campbell, J.P., Dunnette, M.D., performance, and effectiveness. New York: McGraw Hill. Cherniss, C. (2001).
- [4] Cherniss, C., & Goleman, D. (2001). Training for emotional intelligence: A model.
- [5] Cherniss & D. Goleman (Eds.), *The emotionally intelligent workplace* (pp. 209–233). San Francisco
- [6] Goleman, D. (1998). Working with emotional intelligence. New York: Bantam Books.
- [7] Goleman, D. (2001). An EI-based theory of performance. In C. Cherniss & D. Goleman (Eds.), *The emotionally intelligent workplace. How to select for, measure, and improve emotional intelligence in individuals, groups, and organizations*
- [8] Gowing, M.K. (2001). Measures of individual emotional competencies. In C. Cherniss & D. Goleman (Eds.), *The emotionally intelligent workplace* New York: Guilford Press. Hough, L.M. (1992). The "Big Five" personality variables—construct confusion: Description versus prediction.
- [9] Jordan, P.J., Ashkanasy, N.M., & Hartel, C.E.J. (2002). Emotional intelligence as a moderator of emotional and behavioral reactions to job insecurity. *Academy of Management Review*, 27, 361–372.
- [10] Matthews, G., & Zeidner, M. (2000). Emotional intelligence, adaptation to stressful encounters, and health outcomes. In R. Bar-On & J.D.A. Parker (Eds.), *The handbook of emotional intelligence* (pp. 459–489). San Francisco: Jossey-Bass.
- [11] Matthews, G., Zeidner, M., & Roberts, R. (2002). Emotional intelligence: Science and myth? Cambridge, MA: MIT Press.
- [12] Mayer, J.D., Caruso, D., & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence.
- [13] Mayer, J.D., Caruso, D.R., & Salovey, P. (2000). Selecting a measure of emotional intelligence: The case of ability scales.
- [14] Mayer, J.D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D.J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 3–31). New York: Basic Books.
- [15] Roberts, R., Zeidner, M., & Matthews, G.M. (2001). Does emotional intelligence meet traditional standards for an intelligence? Some new data and conclusions. *Emotions*, 1, 196–231.
- [16] Salovey, P., Bedell, B.T., Detweiler, J.B., & Mayer, J.D. (2000). Current directions in emotional intelligence research. In M. Lewis & J.M. Haviland-Jones (Eds.), *Handbook of emotions* (pp. 504–520). New York: Guilford Press.
- [17] Salovey, P., & Mayer, J.D. (1990). Emotional intelligence. *Imagination, Cognition and Personality*, 9, 185–211.
- [18] Salovey, P., & Mayer, J.D. (1994). Some final thoughts about personality and intelligence. In
- [19] Salovey, P., Woolery, A., & Mayer, J.D. (2001). Emotional intelligence: Conceptualization and measurement. In G. Fletcher & M.S. Clark (Eds.), *The Blackwell handbook of social psychology* (Volume 2: Interpersonal Processes) (pp. 279–307). Oxford: Blackwell.
- [20] Slaski, N. (2001). An investigation into emotional intelligence, managerial stress and performance in a UK supermarket chain. Unpublished paper.
- [21] Bar-On & J.D.A. Parker (Eds.), *The handbook of emotional intelligence* (pp. 215–243). San Francisco, CA: Jossey-Bass. Sternberg, R.J., & Grigorenko, E.L. (2000). Practical intelligence and its development.

Small Scale Industry: A Vehicle for Economic Development and Employment Generation (A Study on Jharkhand State)

Saroj Ranjan

Associate Prof., Vinoba Bhave University, Hazaribag. (Jharkhand)

Abstract—The small scale industries are the panacea for any developing country which is characterized by over population, illiteracy, low per capita income and low industrial output. India being a developing economy also stressed on the development of small scale industries for seeking economic emancipation for the people after the attainment of independence. The small scale industry sector is considered to have a major role in the Indian industrial economy with its 40% share in the national industrial output along with 80% in industrial employment and nearly 35% share in the exports. After changing the concept of small industry sector as micro, small and medium enterprises (MSME) sector contributed it has significantly to the manufacturing output, employment and exports of the country. It is estimated that in terms value the sector accounts for about 45% of the manufacturing output and 40% of total exports of the country. This sector is estimated to employ about 59 million persons in over 26 million units throughout the country. There is a need for a strategy for a horizontal geographical spread of the various outreach programs for balanced growth. The potential strategies would mainly rest on five pillars like skill development, markets, technology, and infrastructure and credit availability. Most of the entrepreneurs reported unaware regarding incentives and schemes announced by central as well as state governments. However, the central govt. has planned to provide Entrepreneurship Development Training Programs, Financial assistance to States/UTs, developing E-commerce for marketing of products and availability of raw materials, programmes and schemes for technology development of the sector.

INTRODUCTION

"Small is beautiful". This sentence is frequently used in the context of small scale industries in developing countries like China, Japan, India and other countries in the world. the SSI unit is being treated as beautiful for the reasons of easy start, it needs small amount of capital, no need to concentrate on location theory, easy management, very much dependent upon personal behavior and talent of the entrepreneurs, free from tough legal regulation etc. Earlier cottage industries in India were tagged with "Small Scale industries named as Small Scale and Cottage industries in India". The difference between small scale and cottage industries had been mentioned in "First Five year plan, 1951" as (a) Small Scale industries are mostly located in urban areas, but the cottage industries are normally associated with agriculture and provide subsidiary employment in rural areas; and (b) small-scale industries produce goods with mechanized equipments partially or fully but the cottage industries involve activity mostly by hand and are performed primarily with the help of household workers. In 1950 the Fiscal commission laid down the basis for distinction between the small scale and cottage industries. A cottage industry is thus one which is carried on wholly or primarily with the help of members of the family either as a whole or part of the occupation. A small scale industry on the other hand, is one which is operated mainly with hired labour usually to 10 to 50 hands".

Industrial policy resolutions, 1948, 1956 and policy statement of 1977 have been made in favour of the development of Small scale industries in India. The fixed capital investment in a unit has been adopted for defining small scale unit. Earlier it was Rs.5 lakh and later on the limit has been raised to Rs.10 lakh for small scale unit and Rs.15 lakh for ancillaries in 1977. The units with investment of less than 1 lakh were defined as tiny enterprises. This capital investment limit was raised to Rs 15 lakh for small units and 20 lakh for ancillary units in 1980. Again in 1985, the limit was raised by Government to Rs 35 lakh for small scale unit and Rs 40 lakh for ancillary units.

In 1991 economic reforms were initiated and liberal attitude were undertaken under the head of LPG (Liberalisation, privatisation and globalization). In January 1997, the govt. of India in its policy of industrial reforms had again enhanced the investment ceilings in plant and machinery which was raised to Rs 3 crore and that for the tiny sector has also been raised to Rs. 25 lakh. In 2000, the investment limit for small scale industry was Rs 1 crore, for ancillary unit Rs 1 crore and for tiny units Rs.25 lakh.

Major changes pertaining to the definition of Small scale sector were taking place by the enactment of Micro, Small and Medium Enterprises Development (MSMED) Act, 2006 in which separate investment limits have been made for manufacturing and service enterprises, which are as follows:

MANUFACTURING ENTERPRISES

1. A micro enterprise, where the investment in plant and machinery does not exceed Rs. 25 lakh;
2. A small enterprise, where the investment in plant and machinery is more than Rs 25 lakh but does not exceed Rs 5 crore; and
3. A medium enterprise, where the investment in plant and machinery is more than Rs 5 crore but does not exceed Rs 10 crore.

SERVICE ENTERPRISES

1. A micro enterprise, where the investment in equipment does not exceed Rs 10 lakh;
2. A small enterprise, where the investment in equipment is more than Rs. 2 crore; and
3. A medium enterprise, where the investment in equipment is more than Rs. 2 crore but does not exceed Rs 5 crore.

MSMED Act 2006 effective from October 2, 2006 defined the medium enterprises for the first time. Registration in the small scale industries sector is voluntary. However, as far as manufacturing units are concerned, their registration is mandatory under sections 2 m (i) and 2 m (ii) of the factories act. Section 2 m (i) refers to units engaging 10 or more workers and using power where as Section 2 m (ii) refers to units engaging 20 or more workers and not using power.

MATERIALS AND METHODS

This research article has been prepared with the help of huge materials collected from various sources- both primary and secondary. Journals, periodicals also constitute the source of information books of reputed authors have been used as secondary source to prepare the research article. Personal interviews and consultations have been conducted judiciously and utilized in this research work. The materials used have at times been drawn from the website. Also the efforts have been made to maintain objectivity.

RESULTS AND DECISIONS

The small scale industry sector continues to remain an important sector of the economy with a contribution to G.D.P, industrial production, employment generation and exports. The performance of the small scale industry sector based on the figure mentioned in the Third All India Census of SSIs, 2004 that there was a total 25.71 lakh SSI units in the country in 1994-95 out of which 19.44 lakh were registered units and 6.27 lakh were unregistered units. Again total no. of such SSI units in 2004-05 increased to 118.59 lakh, showing a growth off 4.1% over the previous year, out of which 17.53 lakh were the registered units and 101.06 lakh were unregistered units. The value of production of SSI units in India at current prices has increased from Rs. 2,98,886 crore in 1994-95 to Rs. 4,18,263 crore in 2004 -05 and then to 4,76,209 crore in 2005-06 registering a growth rate of 16.9 % and 13.9% respectively over the previous year. Total number of persons employed in SSI units has also increased from 146.56 lakh in 1994-95 to 271.36 lakh in 2004-05 and then to 312.52 lakh in 2006-07 showing a growth rate of 4.1 and 4.2% respectively over the previous year. The value of exports of SSI units in India has increased from Rs. 29.068 crore in 1994-95 to Rs 1,52,242 crore in 2005-06 registering a growth of 20.8% over the previous year.

There is a strong case for the development of small scale industries in India. The industrial policy resolution 1956 has put forward arguments in favour of small scale industries and these arguments are : (a) employment argument, (b) equality argument for even distribution of income and wealth, (c) the latent resources argument for tapping hoarded and unutilized wealth and (d) the decentralization argument for balanced regional development. At present also small scale industries have an important role in India's industrial and economic development from the point of view of (a) expansion of SSI sector and its share in industrial output, (b) employment generation, (c) efficiency of small scale industries, (d) equitable distribution of national income, (e) mobilization of capital and entrepreneurial skill, (f) regional dispersal of industries; and (g) less industrial disputes.

Due to its national importance, the major policy measures undertaken during 2004-05 for the SSI sector which are as follows:-

1. The national commission in the Unorganized/Informal sector was set up in September, 2004. The Commission will, inter alia, recommend measures considered necessary for improvement in the productivity of these enterprises, generation of large-scale employment opportunities on a sustainable basis, linkage of the sector to institutional framework in areas like credit, raw material supply, infrastructure technology up gradation, marketing facilities and skill development.
2. 193 items reserved for exclusive manufacture in the SSI sector were dereversed in March 2005. The total number of reserved now stands at 506.
3. To facilitate technology up gradation and enhancing competitiveness, the investment limit (in plant and machinery) has been raised in Oct 2004 from Rs 1 crore to Rs.5 crores in respect of 7 items of sports goods, reserved for manufacture in the small sector.
4. The small and medium enterprise (SME) fund of Rs. 10,000 crore was operationalised by the SIDBI since April 2004. 80% of the lending from this fund will be for SSI units, at interest rate of 2% below the prevailing PLR for the SIDBI.
5. The RBI enhanced the composite loan limit for SSI sector to RS 1 crore from 50 lakh
6. With a view to integrate small and medium enterprises, facilitating their growth and enhancing their competitiveness.
7. A new "Promotional Package for small enterprises" is being formulated. This would include measures to provide adequate credit, incentives for technology up gradation, infrastructural and marketing facilities etc.

Measures Undertaken For Small And Micro Enterprises:

The govt. of India enacted the micro, small and medium Enterprises Development Act, 2006 which provides the first ever legal framework for recognition of the concept "enterprise" (comprising both manufacturing and services) and integrating the three tiers of the enterprise, viz. micro, small and medium. Under this Act enterprises have been categorized broadly into those engaged in (i) manufacturing and (ii) rendering of services. The new definition is as follows:

MANUFACTURING ENTERPRISES

1. A micro enterprise where the investment in plant and machinery does not exceed Rs. 25 lakh;
2. A small enterprise, where the investment in plant and machinery is more than 25 lakh but does not exceed Rs. 5 crore
3. A medium enterprise where the investment in plant and machinery is more than Rs 5 crore but does not exceed Rs. 10 crore.

SERVICE ENTERPRISES

1. A micro enterprise where the investment in equipment does not exceed Rs 10 lakh.
2. A small enterprise where the investment in equipment is more than 10 lakh but does not exceed Rs 2 crore; and
3. A medium enterprise, where the investment in equipment is more than Rs 2 crore but does not exceed Rs 5 crore.

The salient features of MSME Act 2006 include:

1. Setting up of national board of MSMEs.
2. Classification of enterprises.
3. Advisory Committees to support MSMEs.
4. Measures for promotion, development and enhancement of MSMEs
5. Schemes to control delayed payments to MSMEs.

On 9 May 2007, subsequent to an amendment of the govt. of India Rules, 1961, the Ministry of small scale industries and the ministry of agro and rural industries were merged to form Ministry of Micro, Small and Medium enterprises (MSME). This ministry now designs policies and promotes programmes, projects and schemes and monitors their implementation with a view to assisting MSMEs and help them scale up.

The primary responsibility of promotion and development of MSMEs is of the State Governments. However the govt. of India supplements the efforts of state governments through different initiatives. The role of ministry of micro, medium and small enterprise and its organization is to assist the states in their efforts to encourage employment and livelihood opportunities.

GROWTH AND PERFORMANCE OF MSMES

The micro and small and medium enterprises sector contributes significantly to the manufacturing output, employment and exports of the country. It is estimated that in terms of value, the sector accounts for about 45% of manufacturing output and 40% of total exports. The sector is estimated to employ about 59 million persons in over 26 million units throughout the country. Further this sector has consistently registered a higher growth rate than rest of the sector.

Table 1: Year Wise Statement of SSI Units after Formation of Jharkhand state.(Rs. in Lakh)

Sl. No	Financial Year	Small	Tiny	Cottage	Total; Registered Unit	Capital Investment	Employment	Investment on Per Capita Employment
1	2000-2001	18	774	563	1355	859.62	3229	0.2662
2	2001-2002	28	1411	1413	2852	3440.24	7048	0.4881
3	2002-2003	27	1533	1106	2666	2631.67	7034	0.3741
4	2003-2004	25	1510	1310	2845	3170.50	6983	0.4540
5	2004-2005	30	1558	1386	2974	3918.05	7586	0.5165
6	2005-2006	33	1408	1387	2828	4050.38	6696	0.6049
7	2006-2007	37	1028	789	1854	4585.50	5467	0.8388
	total	198	9222	7954	17374	22655.96	44043	

Source: Industries Development, Govt of Jharkhand.

The Jharkhand region drew an effective investment plan since its inception in the year 2000. The total investment in different SSI in Jharkhand was Rs 1220.5 crore rupees which created an employment of 20,77,189 persons. Gradually with lapse of time the investment continued to increase in the year 2006-07. The investment in such important sector was to the tune of Rs. 22,655.96 lakh and the employment generation was to the tune of 4404 persons. Though the pattern of investment in different years has not been identified it maintained an increasing trend all the years. It was 859.62 lakh in 2000-2001 which increased to 3918.05 lakhs in 2004-05 and further increased to 4585.50 lakh investment in the year 2006-07. It show that in a back ward state like jharkhand it has not been sementrical. The employment situation too has

been differently affected during different years. In 2000-2001 one unit of employment needed 0.2662 lakh this was increased to 0.4881 in 2001-02 and continuous increase in subsequent years. In the year 2006-2007 one unit of employment needed 0.8386 lakh.

It is seen that though the investment shows the increasing trend during different years but looking to the dimensions of unemployment in the state of Jharkhand it seems that this sector shall require more investment to be infused to cater the needs of unemployment. It further seems that Jharkhand is basically an agrarian economy where more than 70% people depend on agriculture for their livelihood but an account of peoples, poverty, their illiteracy and lack of awareness of modern technique of agriculture, less access to the financial institution for meeting their financial needs and above all lack of proper irrigation facilities, the farmers are forced to remain unemployed for larger part of year. It is only pushing through more unemployed in small scale industries to function as complementary to each other so that their prosperity for the people of Jharkhand can be promoted.

Table 2: MSME w.e.r 2007-2008

Sl.No	Financial year	Minor	Small	Medium	Total	Capital investment	Employment	Remarks
1	2007-2008	651	68	03	722	10855.94	6561	1.6546
2	2008-2009	860	70	01	931	12867.70	6583	1.9546
3	2009-2010	611	56	-	667	7147.557	5211	1.3716
4	2010-2011 upto Jan.480	480	36	-	516	7310.36	4213	1.7351
	Total	2602	230	04	2836	38181.55	22568	

Source: Industries Development, Govt of Jharkhand.

Jharkhand state being very rich in natural resources is supposed to be industrially developed but present scenario is not praise worthy due to internal and external roadblocks. Lack of entrepreneurial expertise, lack of strategic vision, long as well as short term financial problems, technological problems in producing quality goods and competitive domestic as well as international market conditions are the main internal road blocks. Poor infrastructural facilities, administrative problems as many other problems identified by different industrial area development authority are some external road blocks.

DEVELOPMENTAL ROADBLOCKS

The literature and the personal interview with leading and small scale industrialist and officials of Jharkhand Chamber of Commerce reveal the following:

Financial Problems

The scarcity of finance and credit is the main roadblock in the development of small scale industrial units. Many of small units lack finance to have the modern technology and to meet the working capital requirement. They do not have financial resource for allocating to R & D for overall improvement of different products when large firm facing a credit squeeze and having market links with small firms pass on part of their difficulty to the small firms by delaying payments or them or insisting of advance payments.

Lack of Entrepreneurial Expertise

Having the characteristic of single ownership in most of small industrial units, they, at large are ignorant of latest development in the field of production process, marketing concepts developing technology, material management, skill development and policies and practices relating to management.

Lack of Modern Entrepreneurial Vision

Many small scale entrepreneurs do not have experts who have clear cut vision for the all round development of industrial units. Purchase of machine under new technological change, sizeable amount of expenses on advertisement and publicity needs experts services.

Lack of New Technology

Units having new technology are capable of producing high quality goods and percentage of wastage is reduced. Most of the entrepreneurs are unaware of the development in the field of IT, which is required not only in the production development but also in the fields of distribution and marketing.

Marketing Problem

SSI sector at present also has to compete with the emergence of MNCs in both domestic marketing as well as global marketing. Most of the products of SSI units come under the protection umbrella of govt. policy govt. is reducing number of products under reservation for SSI sector year by year. This goes to benefit to medium and large scale industrial units off MNCs.

Besides there are other road blocks for the competitive development of small scale sector, such as power problems, problems relating to regulatory framework, unawareness of several incentives and facilities announced by the state and Central government.

CONCLUSION

The limited potentiality of agriculture in terms of employment generation needs to be supplemented by an increasing investment on small scale industries. The farmers can get gainful employment during the period when they are without any agricultural job or during lean period. Let us hope during this years to come all concerned agencies will take positive attitude towards development of SSI.

Besides govt. help SSI sector will have to compete both in domestic as well as global markets and they have to come out from the protection umbrella of Govt. In short, they have to be independently robust and competitive to face the future challenges.

REFERENCES

- [1] Govt. of India, Planning Commission, The first five year plan 1851, p 162.
- [2] Mishra s.k. and Pari V.K., Indian economy, himalya publishing house, Delhi, 2010, p 369.
- [3] Dhar P.k Indian economy, kalyani publishers, New Delhi, 2009, pp 427–28.
- [4] Ibid 13.
- [5] Ibid, pp. 15–16.
- [6] Govt. of India, A reference Annual publication division ministry of information and broad casting, 2004, p 476
- [7] Dutta and Rudra, India's new economic policy, 1987.
- [8] SIDO, small scale industries in India, New Delhi.

Have EQ: Will Succeed

Shalini Aggarwal

Asst. Prof., JIMS, New Delhi

Abstract—If there is any secret to success, it lies in the ability to get the other person's point of view and see things from his angle. The rules of workplace are changing. People are not judged by just how smart they are, but also by how well they handle others and themselves. This in essence describes the importance of Emotional Quotient (EQ). The above mentioned statement does not talk about the professional world, but encompasses every sphere of life. While Intelligence Quotient (IQ) emphasizes the agility of mind, EQ focuses on the softer skills of building and maintaining human relationships. This aspect of life assumes a lot of importance since nowhere is a person detached from the human element. Be it the workplace, the home front or the social circle, human interactions are inevitable and our success depends to a large extent on what we make of these interactions and relationships.

Keywords: Emotional Intelligence, People Skills, Self Awareness, Intelligence, Organizational Development

INTRODUCTION

For ages now, professional success has depended on factors of technical rationality, analytical capability and external power. These factors have served to overshadow the human characteristics of emotion, spirit, experience and intuition. Business intelligence has so far been dominated by IQ, treating everything and everybody in an inanimate, sequential style, almost mathematic in its precision.

However, the emerging trends show a shift of focus towards treating people, markets, ideas and organizations as interactive, alive and capable of learning. The dynamism required by businesses calls for a high level of emotional intelligence on the part of every employee, lacking which, situations of tension, hostility, anger, frustration and futility are born. It is very important for managers of this era to develop emotional intelligence to understand and accept situations, people and the changes happening around them. Moreover, to be successful, requires effective awareness, control and management of one's emotions and those of other people.

OBJECTIVES OF THE STUDY

1. To suggest that Emotional Quotient contributes towards human and organizational development more than Intelligence Quotient.
2. To understand the importance of people skills.

LITERATURE REVIEW

A high IQ does not necessarily lead to success and happiness. It is well known that in the workplace, top management people often have IQs which are not as high as the IQs of those working under them, but their EQ is higher and better developed. A recent wave of management thoughts and practices champion the cause of Emotional intelligence as that arm, which when added to Intelligence Quotient, defines success. People skills is what a successful person has, be it any functional area. And this is not just limited to the areas of sales and marketing. Market forces today are putting an "unprecedented premium on emotional intelligence for on-the-job success.

Emotional intelligence is defined as how well one manages one's own inner lives and get along with people. It encompasses self-awareness, the ability to manage one's own and other people's emotions, self motivation and empathy. It is the ability to recognize one's own emotions, empathize with peers and deal with crisis. Which unlike IQ, is much more difficult to quantify, though that too is being attempted. These are the characteristics that enable someone to climb higher in the corporate ranks than colleagues with far superior IQs.

Not surprisingly, it is at the workplace that emotional intelligence is finding the most acceptance and use. Till now organizations have only been talking of the skill levels of the individuals, but EQ brings out an important dimension of the executive paradigm. Business organizations nowadays are more concerned about the ability of people to know, manage and monitor their emotions. Intelligence, after all, is genetically driven. They are of the opinion that it is worthwhile to lose a candidate who is brilliant but who will give trouble getting along, rather than a person whose skills are average but whose EQ is strong, for he can be trained. It benefits the company and the individual in the long run.

Indian companies are increasingly beginning to use EQ questionnaires to evaluate candidates, both at the recruitment stage and the promotion levels. Firms are regularly conducting workshops to improve the EQ of its managers. Today there are a lot of psychometric tests which are designed for more insight into the employee. The reason for the sudden interest in using these tests at the recruitment stage is because of the shift from manufacturing to services. This shift implies that people are becoming more important. Their behavioral traits are therefore very important.

The need to test and use EQ arose when industry managers found that while they were able to get people with good technical skills, the same people lost in performance when they were promoted to levels which required higher people

management skills. These are the contexts where one sees the need for emotional intelligence which can be used in a very practical way. The emphasis should be on EQ and not IQ, for after a certain level, it is the attitude that carries a person through.

The crux of emotional intelligence is controlling feelings, and expressing them in such an effective and timely manner that they enhance one's career and other personal goals. Self control, self awareness, belief in oneself, resilience, courage, conscientiousness, initiative, adaptability, cooperativeness and empathy are some virtues that are central to emotional intelligence.

The key is self awareness, the cornerstone of emotional intelligence. It reflects the ability of a person to be able to know the reasons for his emotional response, thus improvising his chances of handling it in an appropriate manner. This is being able to stand back and recognizing what you are feeling. This is not an easy skill, yet, for all its complexity, self awareness is the most crucial skill, as it allows to exercise self control. What self awareness does is it allows people to develop coping mechanisms during periods of intense emotional upsurge.

A person with high emotional intelligence is also highly productive and effective in any undertaking. Not being burdened by irrational fears, gloom, depression and anxiety, he is generally cheerful and outgoing. On the other hand a person with very high IQ but low EQ can be very badly adjusted, taking failure personally and viewing setbacks as life threatening.

Although a few lucky are born with traits of emotional intelligence, educationists are convinced that it can (and should) be acquired through training. It can be learned, cultivated and increased in adulthood. And the place to begin this is not the workplace but in school.

Schools should emphasize on emotional intelligence of the child. A child who sees that he will be evaluated only in terms of performance in exams will not care to develop his emotional skills. A child can be enriched through a blend of lessons on feelings and relationships. They can be blended into the subjects to give teachers entry points to discuss topics such as empathy. The ways we respond to a given situation develop well into adolescence, giving parents and teachers an opportunity to develop in children both their analytical and their emotional abilities. Essentially, if one can balance the rational mind with the emotive mind, it can give the person that extra punch.

For all its support among managers, EQ has generated strong opposition from some psychologists. They vehemently object to the idea of trying to measure emotional skills as intelligence. But neither they nor behavioral researchers opposed to EQ have been able to answer the questions that cognitive theory has simply not been able to explain. For instance, why some people have a gift for living well; why we like some people virtually on sight and distrust others; why some people remain buoyant in the face of troubles that would sink a resilient soul. What qualities of the mind and spirit determine who succeeds? The answer lies in the theory of emotional intelligence. Concepts like empathy, not being paralyzed by depression or worry, to know your feelings and to use that knowledge in effective ways, and handling feelings in relationships are nothing new really. After all common sense has long told us that there is more to success than just a high IQ.

CONCLUSION

Emotional Quotient is increasingly relevant to organizational development and developing people, because it provides a new way to understand and assess people's behavior, management styles, attitudes and interpersonal skills. It is an important consideration in all aspects of an organization: human resource planning, job profiling, recruitment interviewing and selection, management development, customer relations and customer services, etc.

REFERENCES

- [1] Bradberry, Travis and Greaves, Jean, (2005) "The Emotional Intelligence Quick Book", Simon and Schuster, New York.
- [2] Dulewicz, V and Higgs, M. (2000) "Emotional intelligence – A review and evaluation study", *Journal of Managerial Psychology*, Vol. 15 No. 4, pp. 341–372.
- [3] Feldman-Barrett, L. (2002) "The wisdom in feeling: psychological processes in emotional intelligence", Guilford Press, New York.
- [4] Gardner, H. (1983) "Frames of mind, Basic Books", New York.
- [5] Goleman, D. (1995) "Emotional intelligence", Bantam Books, New York.
- [6] Goleman, D. (1998) "Working with emotional intelligence", Bantam Books, New York.

Impact of Creativity and Innovation on Organizational Effectiveness

Shipra Agarwal and Garima Rawat

Lecturer, CMCA, TMU

Abstract – The purpose of this paper is to develop a creativity and Innovation to organizational competitive excellence. For model linking, creativity and Innovation both are important for organizational effectiveness. Causing changes in the creativity and innovation is more important for development of the organization with innovation can adapt itself to new conditions and changes to the process. In competitive world, organizations success is based in competing with others who can best take advantage of the opportunities ahead, and this is possible only with increased creativity and innovation.

This paper examines the organizational innovation and the level of creativity is a function of individual efforts and organizational systems to facilitate organizational effectiveness. In this context, individual creativity mechanisms refer to activities undertaken by individual employees within an organization to enhance their capability for developing something, which is meaningful within their work environment. If the necessary flexibility for organizations dealing with environmental changes and the complexity of the minds, certainly not necessary to solve problems in organizations, organizational success and productivity of the organization will be eliminated from the competition field, there will be complete chaos. So the creativity and innovation is more important for development of the organization.

I have tried to link the importance of creativity and innovation on organizational effectiveness in this paper.

Keywords: Creativity, Innovation, Organization, Effectiveness

INTRODUCTION

Creativity

In today's world of thought, creativity, and its use in organizations is inevitable. Birth and death of the Organization depends on their growth and survival factors such as ability, so creativity and innovation is dependent on their human resources.

If the staff and decision makers are creative in organizations, have the capacity to better understand the opportunities and resources. they are able to innovate more and grow faster as a result of their greater durability. Creativity in today's organizations is looked upon more than a topic of interest.

In other words, organizations are being forced to protect themselves from their competitors to market new services in different time periods that are essential to, creative the category of creativity and innovation in other organizations from our new and recreation and cannot maintain dynamic and competitive organization in dealing with environmental threats and risks and opportunities.

I think, the creativity is designed to enhance the quantity or quality of activities such as increased productivity, enhanced products or services, reduce costs and so forth. The main reason for the effectiveness of creativity training programs is to make creative thinking spend on these programs as an effective source of creativity. Other factors also play a significant role in the success or failure of creativity educational programs.

From this perspective, creative people become familiar with the problem or opportunity and then collect information about the problem or opportunity to be involved. Creative people tend to focus on the issue at a later stage, this stage is not observed and the person to tangible activities in organizing thoughts, ideas, experiences.

Innovation

The innovation, creativity and action has been manifested, in other words, the idea of creative innovation is achieved, namely to provide innovative products, processes and new services to market. Innovation is the use of mental abilities to create a new idea or concept.

Innovation is the creation of better or more effective products, processes, services, technologies, or ideas that are accepted by markets, governments, and society. Innovation differs from invention in that innovation refers to the use of a new idea or method.

To survive in today's, organizations need to succeed in their life with associated with innovation. Innovation is a multidimensional process that encompasses all levels of an organization. Innovation, on the one hand is the customer's identity is known and successful organizations survive the password.

In current conditions, that working patterns and technology in a very short time is changing.

Creativity and innovation is not an option, but is a necessary and sufficient for the lack of attention to the irreparable damage. It was the only way to survive as an organization in today's turbulent and changing. It is to keep pace with environmental changes. In other words, the political environment, economic and social changes today that is unthinkable,

and predictable, the only organizations that can be hoped to continue his life of a leading, creative, innovative and very creative importance of today's modern organizations is a reason to have respect for creativity and innovation through new ideas and new environmental developments in line with the appropriate changes to the development and evolution of organizational reach.

Undoubtedly, innovation and creativity, rocks and the way of productivity and economic organizations have been able to do the necessary measures in this regard, the results are remarkable in their output and efficiency.

"Creativity and innovation for achieving organizational effectiveness is something inevitable." It is now one of the major challenges managers to use mental abilities to create a new concept or idea. The challenge of the critical role of managers in fostering creativity and innovation, human resource is the talent and ability.

DIFFERENCE BETWEEN CREATIVITY AND INNOVATION

The distinction between creativity and innovation is an important one. Creativity as "the ability to produce work that is original, unexpected and appropriate useful, adaptive concerning task constraints. Although the measurement of creativity deserves a lot of attention, words associated with this definition of creativity include *idea*, *invention*, and *breakthrough*. However, innovation is a process of developing and implementing new ideas. Innovation refers to the process of bringing any new problem solving idea into use. It is the generation, acceptance, and implementation of new ideas, processes, products, or services. This process can take place in many different domains it can be technical, but also organizational means process improvements. The focus here, particularly in the context of an organization, is on taking a creative idea and bringing it to fruition. For example, in the life of an organization, many brilliant ideas never see the light of day. To bring an idea from concept to market, it must be recognized for its potential it must receive funding in an environment of scarce or at least competing resources and it must overcome potential obstacles such as technology challenges, competitive pressures, and a variety of other obstacles. The process by which this happens is referred to as innovation and it is an important process when talking about creativity in the context of organizations.

ORGANIZATIONAL EFFECTIVENESS

The people who formulate independent business identity for some specific purpose is commonly known as organization and getting desired outcome within defined resources is treated as effectiveness.

Organizational effectiveness is the notion of how effectual an organization is in accomplishing the results the organization aims to generate. It plays an important role in accelerating organizational development.

Organizational effectiveness is defined as the extent to which an organization by use of certain resources, fulfils its objectives without depleting its resources and without placing undue strain on its members and society. The goal model describes organizational effectiveness in terms of the extent to which an organization attains its objectives. The organizational effectiveness in terms of a background evaluation "of component preferences for performance and natural limitations on performance from an external environmental perspective" (Zammuto R.F., 1982).

The organizational effectiveness "as a set of several statements, each reflecting the evaluative criteria applied by the various constituencies" involved with the organization being evaluated with an emphasis on means criteria (Connolly T, 1980).

The study is aimed to determine the factors that increase the creativity and innovation and the relationship of organizational effectiveness for organizational development.

IMPACT OF CREATIVITY AND INNOVATION ON ORGANIZATIONAL EFFECTIVENESS

Creativity and innovation are closely related constructs that share significant overlap in characteristics. However, in essence, creativity is the generation of novel and useful ideas and Innovation is the process by which these ideas are captured, filtered, funded, developed, modified, clarified, and eventually commercialized and implemented. It is creativity that fuels the innovation pipeline. In order for an organization to remain relevant and to compete in pursuit of its mission, management of organizations must pay attention to both ends of the process, generating creative ideas frequently and utilizing its innovation process to realize the potential value of those ideas.

The organizational effectiveness encompasses several aspects, including encouragement of risk taking and idea generation, supportive evaluation of ideas, collaborative idea flow, and participative management and decision making. Organizational structures and a culture that supports, or perhaps more appropriately does not punish, this type of communication will be more likely to have more effective creativity and innovation.

Creativity and innovation in the organizational structure and culture should be the main factor for effectiveness and provide appropriate environment in an organization. In other words, creativity and innovation require appropriate structures and managers must pay attention to it and have the necessary knowledge. One of the factors that help foster creativity and innovation is education. You can teach people with talent, creativity and innovation in education. Enhanced features such as risk tolerance, reduction of external control, acceptance of ambiguity, contradiction tolerance and increase overall creativity and innovation will facilitate communication.



Fig. 1

IMPORTANCE OF THE RESEARCH WORK

Creativity & innovation plays an important role to identify and examine the internal environment of any organization. Creativity & innovation tells information of the employees working. Creativity & innovation are today's hot issue to be discussed by various famous companies to increase the productivity of employees and effectiveness of organization because Creativity & innovation are the major player which puts impact on the effectiveness of organization and art of employees. Effectiveness of organization has significant influence on the attitudes and behaviors complied with values on the organization members.

Creativity and innovation in the organizational structure and culture should be the main factor for effectiveness and provide appropriate environment in an organization.

CONCLUSION

This study can help organization to pay more attention and be more focused to maintain a good organizational culture. Creativity and innovation both is the mirror of organizations effectiveness which can make or break the image and goodwill. Creativity and innovation is also useful for controlling and generating new ideas for effective working in organization. In present every organization is getting involved to provide the effective working environment in their organization with the help of creativity & Innovation. To create working solutions, a developmental approach should be used with the help of creativity and innovation. At last, for a successful organization, it is of central importance that management must have take creative and innovative attitude and sufficient belief in the capabilities of its workers and teams.

REFERENCES

- [1] Biswas U & Nanda Mathew R(2001), "Impact of perceived empowerment on Managerial Effectiveness"
- [2] Abdouljad Khalili (Innovation and its Impact on the Efficiency of Organizations in the Third Millennium) E. H Scrin(1995) Organisation culture & Leadership Jossey Bass, San Francisco
- [3] S. Rai (2001) Human Resource Management, "Personal effectiveness", IIM Lucknow vol. 57 pg 132
- [4] Sekaran(1989), "organization behaviour", New Delhi, JMG publication
- [5] Singh R.P. & Chabbar T.N. (2004), "Organization theory and behaviour", Danpat Rai & CO. Pvt Ltd
- [6] Sanghamitra Bhattacharyya "Creativity and Innovation for Competitive Excellence in Organizations"
- [7] Martins, T.C. and Terblanche, F. (2003), "Building organizational culture that stimulates creativity an innovation", European Journal of Innovation Management, Vol. 6, No. 1, pp.64-74.
- [8] Steven Dhondt, " Knowledge management, innovation and creativity"

Road Transportation in India with Reference to National Highway

S.H. Indurwade¹ and Sacheen S. Aloney²

¹HOD, Department of Economics, R.T.M. Nagpur University, Nagpur

²Om College of Engineering Wardha (MS)

Abstract—The total investment in the infrastructure sector from INR1,230 billion in 2000 (representing 4% of the country's GDP) to INR 3,025 billion in 2009 (representing 6.5% of its GDP). However, the contribution is still low as compared to other countries. For instance, infrastructure spending in China is around 11% of its GDP.

Road network in India aggregates to about 3.3 million kilometre. This extensive road network, the second largest in the world, caters to about 65 per cent of the freight traffic and 87 per cent of the passenger traffic. National Highways constitute about 70,934 kilometres which is only 2 percent of the total network.

The government of India has allocated funds for the development of roads sector across all plan periods. The total estimated investment in road projects is of around Rs. 314,152 crore during the Eleventh Five Year Plan period and 34 percent (Rs. 106,792 crore) of this estimated investment is to be the private investment. In India, private sector generally participates through Public Private Partnership (PP) basically through popular PPP models such as Build-Operate-Transfer (BOT) and Special Purpose Vehicles (SPV). Government is also encouraging foreign investment by allowing 100 per cent foreign equity participation.

With increasing gap between supply and demand due to increase in traffic, usage of roads in a safe and sustainable manner has become an important issue. In this context, maintenance of roads, availability of trained manpower, use of modern technology, performance evaluation of management, availability of trauma care centres etc are priorities in road transport in India.

Keywords: Road Infrastructure, Road Transport, National Highways

INTRODUCTION

An efficient and well-established network of roads is desired for promoting trade and commerce in any country and also fulfills the needs of a sound transportation system for sustained economic development. Development of roads contributes to economic growth by promoting marketing of products, flow of goods and services and people. It also promotes human capital by enhancing access to education and health services.

Due to increase in India's GDP, the government has increased its total investment in the infrastructure sector from INR1,230 billion in 2000 (representing 4% of the country's GDP) to INR 3,025 billion in 2009 (representing 6.5% of its GDP). However, the contribution is still low as compared to other countries. For instance, infrastructure spending in China is around 11% of its GDP.

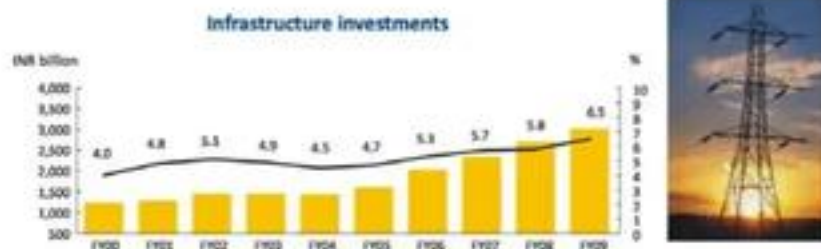


Fig. 1: Infrastructure Investment in India

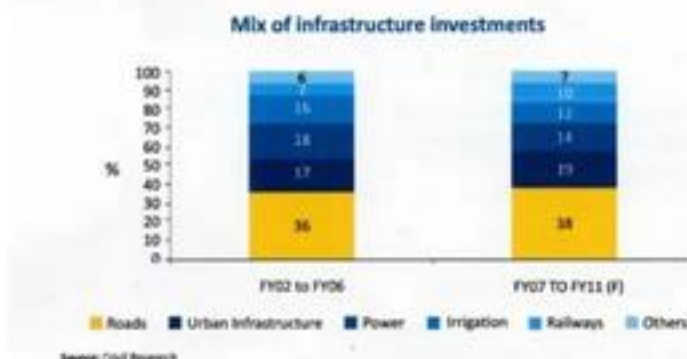


Fig. 2: Sector Wise Infrastructure Investment in India

TRANSPORT INFRASTRUCTURE IN INDIA

Transport Infrastructure in India has a share of 6.4 per cent of GDP and its demand has been accelerating over the years. The road transport plays an important role in promoting the development of the backward regions and integrating them with the mainstream economy by opening them to trade and investment. Roads are a crucial mode of transportation which connects long distances and also remote villages in country like India.

PRESENT SCENARIO OF ROAD TRANSPORT IN INDIA

An important component of transport infrastructure is road transport. The road density has been increasing over the years in India. For instance road density in India stood at 714 per sq km of land area in 1991, increased to 1171 per sq. km in 2007. In Asia, only two countries namely Singapore and Japan have a better road density than India. However, most highways in India are narrow and congested with poor surface quality, and 40 percent of India's villages do not have access to all-weather roads.

It also shows that paved roads as a percentage of total roads in India have remained almost the same at an average of about 47 per cent. However, in several other countries like Russia, Korea, Malaysia and Japan paved, roads as a percentage of the total roads are quite high as compared to India. In Singapore, paved roads a percentage of total roads are 100 per cent followed by Malaysia and Russia where the percentage is more than 80 per cent. Further, goods transported by road are the volume of goods transported by road vehicles, measured in millions of metric tons times kilometers traveled. Goods transported are the maximum in China followed by India. But over the years, goods transported using road network is growing much faster in India along with China. This fast increase in freight traffic in India creates much pressure on the existing roads and thereby there is a demand for new roads. Another important parameter highlighting the importance of road infrastructure is the energy consumption of roadways. This percentage is high for countries like Malaysia, Korea and Japan and low for countries like China and India (4.8 per cent and 6.2 per cent) respectively).

Table 1: Roads Transport in India: A Comparative Picture

	Road density (km of road per sq. Km Road of Land area)			Paved Road			Goods Transported (Million ton-km)			Energy Consumption (% to total Energy Consumption*)		
				1991	2001	2007	(% Total)	1991	2001	2008	1991	2001
India	714	1008	1171	47.3	47.7	48.3	267000	615789	978234	7	6.1	6.2
China	123	151	360	34.2	40.2	49.6	321456	620050	1256788	2	4.4	4.8
Brazil	196	203	282	8.6	5.5	5.6			975420	21.5	22.9	22.7
Russia	54	32.80	35.3	75.8	NA	80.9		23300	199000	6.1	5.9	6.1
Malaysia	274	218	278	71.3	77.9	81.3				19.5	21.7	18.5
Korey	599	607	1020	76.4	76.7	77.6	341	565	12545	12.2	12.2	12.6
Singapore	4136	4453	4710	97.1	100	100				12.6	10	9
Japan	3060	3214	3166	70.1	77.1	79.3	283776	313072	346420	15.1	15.5	14.2

Source: WDI, Various Yews

Notes: * Total energy used in the road sector to total energy consumption in the Country.

There are several other indicators which are used to analyze the importance and development of road infrastructure in the country. These include road length, passengers carried i.e. million passenger kilometers, vehicle per km of road, passenger cars per 1000 people etc. The total road length in India (in 000 kms) is comparable and almost on par with China and India, better than countries like Japan and Singapore. Though the road length of India is one of the highest in the world, as mentioned before, the quality of roads is really poor compared with other developing and developed countries. But when it comes to passengers per kilometer, the figure is quite high. Poor quality of road network and high passenger traffic along with high freight traffic shows the conditions of the Indian roads and the need for growing demand for more quality and quantity of road infrastructure. Given the present conditions, the fast growing vehicles (per K.M.) is going to create more congestion in coming years. Overall, in almost all the other indicators, India has a long way to go as compared to China and other East and South East Asian countries.

Table 2: Roads Transport in India-Comparison with other Countries

	Total Road Length (000' km)			Passenger Carried (Million Passenger-km)			Vehicle (per Road)		(Per 1000 People)		Consumption (kt of Oil Equivalent)		
	1991	2000	2007	1991	2001	2008	2002	2007	2002	2007	1991	2001	2008
India	2350	3316	3317	767700	2075700	725100	3	6.8	7.0	15	0	0	0
China	1230	1402	3583		720710	1150677	9	11.9	8	22.5	0	0	0
Brazil	1661	1724				78000	18	22	128	158.1	0.2	0.2	0.3
Russia	892	532					28.88	104	156	206	0.3	0.3	0.3
Malaysia	56	66					70	73.8	211		0.3	0.5	0.5
Korea	58	86	102			97854	145	160.6	205	248	0.2	0.5	0.6
Singapore	2	3	3.2				178	207	97	113	0.5	0.5	0.5
Japan	1115	1166	1196	869123	954294	905910	63	63.5	428	325	0.5	0.6	0.6

National Highways in India

The road transport sector in India has expanded manifold after independence both in terms of spread and capacity. Road network in India aggregates to about 3.3 million kilometre. This extensive road network, the second largest in the world, caters to about 65 per cent of the freight traffic and 87 per cent of the passenger traffic. National Highways constitute about 70,934 kilometres which is only 2 per cent of the total network. However, it caters to nearly 40% of the total road traffic. Out of the total length of National Highways, 17 percent is four-laned, 53 percent is two-laned and 30 percent single laned. This seemingly large road network, however, is inadequate to meet the accessibility and mobility requirements of a country of India's size and population.

Table 3: Composition of the Road Network in India

Indian Road Network of 33 Lakh Km.is Second Largest in the World and Consists of Length(In Km):	
Expressways	200
National Highways	70,934
State Highways	1,31,899
Major District Roads	4,67,763
Rural and Other Roads	26,50,000
Total Length	33 Lakhs Kms(Approx)

Source: www.nhai.org/roadnetwork.htm (as on 25.06.2009)

There has been a significant growth in road traffic in the past. The average growth of road traffic is stated to be in the order of 8 to 10 percent in recent years. Road sector consists more than 60% of the freight traffic and 85% of passenger traffic. However, the road network has not grown adequately to meet the growing traffic demand. The conditions of entire road network in India are grossly inadequate and poor to meet the growing requirements.

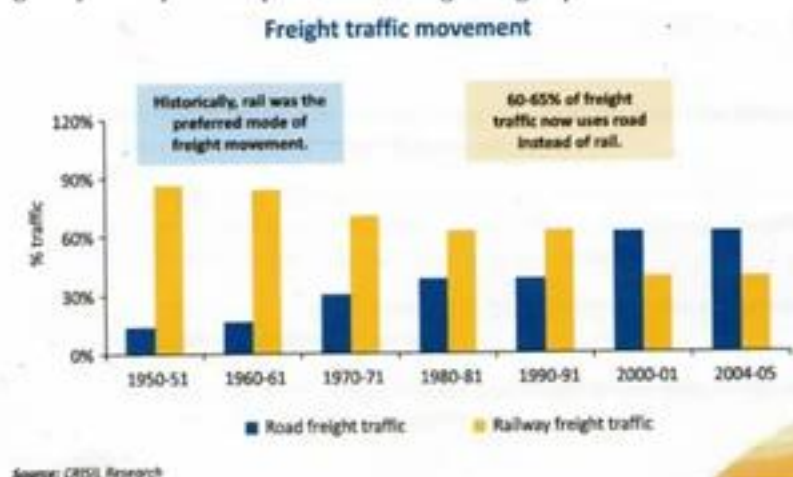


Fig. 3: Freight Traffic Movement in India

The government has made efforts to increase the total road length in the country with emphasis on all types of highways and other roads. The total number of vehicles has increased from 306,000 vehicles in 1950-51 to a whopping 48,857 thousand in 2000-01 and 89,618 in 2006-07. Of this, the largest increase has been in the case of goods vehicles, cars, jeeps and taxis and two wheelers. But the expansion in the road network has not been commensurate with this increase.

For development of roads, the long-term 20-year plans were formulated for the central and state governments to formulate their successive Five Year Plans.

Table 4: Targets and Achievements under 20-Year Road Plans (Length in km)

Road Category	Nagpur Plan (1943-61)		Bombay Plan (1961-81)		Lucknow Plan (1981-2001)	
	Target	Achievement	Target	Achievement	Target	Achievement
National Highways	33,395	22,636	51,500	31,737	66,000	57,700
State Highways	86,825	62,052	112,650	95,491	145,000	124,300
Major District Roads	80,145	113,483	241,400	153,000	300,000	
Rural Roads (other than district roads and village roads)						2,074,000*
	332,335	500,802	651,780	912,684	2,189,000	
Total	532,700	698,973	1,057,330	1,192,912	2,700,000	2,256,000*

Source: NCAER- Holcim(2010).

According to the Tenth Five Year Plan, the National Highway network has a total length of 58, 112 km. The total length of National Highways at the beginning of First Five Year Plan was only 22, 255 km and the growth was quite slow

over the subsequent decades and till the Ninth Five Year Plan. For example, the total length of National Highways was only 31,710 sq km at the end of Sixth Plan and 34,298 at the end of Ninth Plan. However, there was a quantum jump in the National Highway network by the end of Ninth Plan to 58,112 k.m. Thus, while only 12 thousand kilometers were added over thirty year period prior to Ninth Plan, more than 20 thousand kilometers were added in a span of five years during the Ninth Plan. This growth has occurred mainly due to upgradation of state highways to national highways. However, this has put significant burden on the available resources for the maintenance of national highways since the resources are spread thinly across the network. It is observed that more than 50 percent of the network is considered to be under pressure and of poor quality. It is evident that the maximum addition in road length was achieved in the second five year plan, fourth five year plans, sixth, seventh and the ninth five year plans. But given the increase in road traffic, there is tremendous scope for increasing the road length in India.

With a determined focus to improve the road network in the country, the government of India has allocated funds for the development of roads sector across all plan periods. Every year the outlay for roads has increased and in most plans the total. The present allocation for maintenance of national highways is only 40 per cent of the requirements based on the norms for maintenance. Due to resource constraints private sector also needs to be involved in maintenance of national highways.

Table 5: Shortfall in Funds for Road Maintenance in the Tenth FYP (Rs Crore)

Year	Requirement as Per Norms	Amount Provided	Shortfall	Shortfall as % of Requirement
2002-03	2,200	800.00	1,400.00	63.64
2003-04	2,200	731.74	1,468.26	66.74
2004-05	2,480	745.56	1,734.44	69.94
2005-06	2,480	868.10	1,611.90	65.00
2006-07	2,480	814.38	1,665.62	67.16

Source: Planning Commission (2008).

CHALLENGES AHEAD

The problem in the road sector is that only little more than 1 percent are four lane and good quality roads while rest are either two lane or single lane. The development of new roads and maintaining existing roads to cater the increasing demand requires huge investment in this sector which is difficult to come by. The 11th five year plan emphasizes on private sector participation by encouraging Built-Operate-Transfer model, allowing toll roads etc and thereby the result so far has been satisfactory. Government does encourage private sector by giving exemptions of custom duties on import of equipments, helping in land acquisition, and providing utilities for construction. In India, private sector generally participates through Public Private Partnership (PP) basically through popular PPP models such as Build-Operate-Transfer (BOT) and Special Purpose Vehicles (SPV). Government is also encouraging foreign investment by allowing 100 per cent foreign equity participation under automatic route and giving tax exemptions.

Further, planning commission has emphasized on integrated road development along with railways and other modes of transportation to make it more effective. With increasing gap between supply and demand due to increase in traffic, usage of roads in a safe and sustainable manner has become an important issue. In this context, maintenance of roads, availability of trained manpower, use of modern technology, performance evaluation of management, availability of trauma care centres etc are priorities in road transport in India.

In 2001, the National Highways Authority of India (NHAI) kick-started the highway capacity development programme to connect four metropolitan cities, New Delhi, Mumbai, Chennai, and Kolkata. Since then the National Highways Development Program (NHDP) has expanded in scope and coverage as the economy has grown. Presently, NHDP is divided in seven phases. At present, NHDP is being implemented in four phases – Phase I, II, III, and V, comprising 33,455 km. Till 2009, 30 per cent (10,511 km) of a total of 33,455 km has been completed.

The main source of finance of NHAI for the implementation of various phase of NHDP is fuel cess of Rs.2.00 per litre on both petrol and diesel, a part of which is allocated to NHAI to fund implementation of NHDP. During 2008-09, an amount of Rs. 9,329.85 crore has been provided for the National Highways and for State roads out of the same. The Government of India has also taken various loans from World Bank (US\$1,965 million), Asian Development Bank (US\$1,605 million) and Japan Bank for International Cooperation (Yen 32,060 million) for financing projects under NHDP. These multilateral loans have been passed on to NHAI by the Government partly in the form of grant and partly as loan. NHAI also negotiated a direct loan of US \$165 million from ADB for one of its projects. The funds provided to NHAI including the borrowings from the market are utilized for the projects and for servicing and repayment of borrowings from domestic market.

The enormous investment requirement, long gestation period and uncertainty of returns were mainly responsible for the lack of interest by the private sector. The presence of significant externalities also warranted the dominant role of the State in providing basic road infrastructure. In the allocation of budgetary resources, therefore, the development of road infrastructure is still given priority. However, the resource requirements for maintenance and expansion have far exceeded

the capacity of the budget, making a strong case for private sector participation. Private sector participation is expected to help upgrade the technology, improve the quality and lower the costs. The total estimated investment in road projects is of around Rs. 314,152 crore during the Eleventh Five Year Plan period and 34 percent (Rs. 106,792 crore) of this estimated investment is to be the private investment. Given that the private participation during the Tenth Plan was less than 5% this is certainly a challenging task.

PPP initiative in the Roads Sector has been largely on the BOT basis. The policy framework for toll-based BOT projects was approved in 1997. In 2005 it was decided that all future programmes/projects under NHDP would be awarded only on BOT basis. Contracts based on BOT model are inherently considered superior to the traditional Engineering Procurement and Construction (EPC) contracts as BOT projects ensure higher quality of construction and maintenance of roads and completion of projects without cost and time overrun.

Table 6: Road Infrastructure Detailed Projections (US\$ Million)

Year	National Highways			Total	State Roads (Highways, Major District Roads, Other Roads)			Rural Roads	North East	Total
	NHDP ¹ Public	NHDP Private	Non-NHDP (Public)		Public	Private	Total			
2007-08	3,173	3,702	463	7,338	4,347	1,333	5,680	1,875	212	15,104
2008-09	3,305	3,966	486	7,757	4,528	1,428	5,956	2,025	238	15,976
2009-10	3,464	4,495	510	8,469	4,745	1,618	6,364	2,150	291	17,273
2010-11	3,834	5,685	536	10,055	5,253	2,047	7,299	2,300	317	19,971
2011-12	4,707	6,478	563	11,747	6,488	2,345	8,834	2,463	344	23,387
Total	18,483	24,326	2,557	45,365	25,361	8,771	34,132	10,813	1,401	91,711

NHDP—NATIONAL HIGHWAY DEVELOPMENT PROGRAMME

The central as well as a few state governments have successfully harnessed private sector partnership in road development. The government is now convinced of the merits of partnering with the private sector. Projects are offered on BOT basis to private agencies. After the concession period, which can range up to 30 years, road is to be transferred back to the Government/public sector by the concessionaire. Also, to attract the private sector to projects that are not commercially viable but considered essential, the government has established a Viability Gap Funding (VGF) mechanism to provide a grant of up to 40% of the project cost.

In the backdrop of tangible steps taken by the Government to mainstream PPP in the Roads Sectors, constraints to PPP initiative in the roads sector are perceived to be few and far between at least at the central level. Some of the constraints which prevail are:

Capacity of the Construction Industry

PPP mode of road project delivery helps in redistribution of risks, but the actual delivery of the road works still depends on the capacity of the construction industry, which needs to be strengthened, qualitatively and quantitatively, in spite of the noticeable capacity building in delivering road works in recent past.

Absence of an Independent Body/ Regulator

There is need for a fair and independent body, more in the form of a road authority/user board rather than an exclusive economic regulator (similar to telecom, energy and insurance sectors) to act as a quasi-regulator. In the absence of any independent oversight/control mechanism, the toll rates may be set without reference to the economic benefits and costs arising through externalities and social considerations.

Need for Long Term Funds

Given the need for long term funds for BOT contracts, availability of funds might become an issue, particularly so with the prevailing global financial slowdown.

Land Acquisition

Land acquisition procedures and compensation demanded for transfer of Government land hinder the implementation of PPP projects in Roads Sector.

Environment and Forest Clearances

Delay in getting the forest clearance/wildlife clearance is another constraint. Additional conditions and demands for compensatory afforestation, dedicated strip for plantation, staff quarters, etc. have resulted in delays in implementation of projects.

Clearance of Railway for Rail Over Bridges

Securing approvals from the Railways has caused delay in implementation of some projects.

Shifting of Utilities

In many projects implementation has been affected due to delays in shifting of utilities such as electric lines, water pipelines, sewer lines, telecommunication lines, etc.

REFERENCES

- [1] Bandyopadhyay, Kaushik and Thukral, K L. (2010). Passenger Road Transport in India: Major Challenges in Reducing Energy Consumption and CO2 Emissions and Ways Ahead, Asian Institute of Transport Development.
- [2] Bhattacharyya, Anushree and Chakraborty, Debashis, (2006) India's Recent Infrastructure Development Initiatives: A Comparative Analysis of South and Southeast Asia, Jawaharlal Nehru University, Indian Institute of Foreign Trade
- [3] Choudhary Ajeet K, Deepak Dangayach & others (2001), Road Sector in India, Submitted in partial fulfillment of the course Infrastructure Development and Financing, Indian Institute of Management, Ahmedabad.
- [4] Dhanendra Kumar, (2007). Competition and Road Transport Sector, Chairman of Competition Commission of India
- [5] India Infrastructure Summit (2010), FICCI, Federation House, New Delhi
- [6] Position Paper on the Roads Sector in India, (2009) Department of Economic Affairs, Ministry of Finance, Government of India
- [7] Pravakar Sahoo (2011), Transport Infrastructure in India: Developments, Challenges and lessons from Japan, Institute of Development Economics Japan External Trade Organisation.
- [8] Ryan J. Orr and Jeremy R. Kennedy (2007), Highlights of recent trends in global infrastructure: new players and revised game rules, Stanford University.
- [9] Singh N.K. and Jessica S. Wallack (2011), Moving India: The Political Economy of Transport Sector Reform, Stanford University
- [10] Sriraman S., Walchand Hirachand, (2007), Competition Issues in the Road Goods Transport Industry in India with special reference to The Mumbai Metropolitan Region, Department of Economics, University of Mumbai

The Role of Small and Medium Scale Enterprises in the Future of Emerging Economies (A Case Study of India)

Viksit Tripathi, Swastika Tripathi and Vaishali Singhal

Asst. Prof., IFTM University

Abstract—It is quite evident that the bright future so desired by an economy basically rests on the shoulders of strong entrepreneurial base. Take the example of any giant economy and we will get the answer that until and unless the manufacturing base (especially the entrepreneurial activities) is strong no economy can exist for long in the race of becoming number one. Hence, the prime requisite in making an economy win the number race is: sorting, analyzing and eradicating the problems of small and medium scale enterprises. The main aim of this paper is to highlight the importance of small industries and their role in the economy and the impact of economic reforms on growth pattern and productivity performance of small-scale industries. Small industries are faced with numerous problems major and minor, which make them either uncompetitive, or sick.

Keywords: Small-scale industries (SSI), Medium scale industries, Growth pattern of SSI, Government incentives, Entrepreneurial activities, Entrepreneur.

INTRODUCTION

'Entrepreneurship is the professional application of knowledge, skills and competencies and/or of monetizing a new idea, by an individual or a set of people by launching an enterprise de novo or diversifying from an existing one (distinct from seeking self employment as in a profession or trade), thus to pursue growth while generating wealth, employment and social good'. India has traditionally always had a very vibrant and competitive SSI. During pre-economic liberalization period a wide variety of incentives, concessions and institutional facilities were extended for the development of SSIs. But these socialistic promotional policy measures, in many cases resulted in protection of weak units rather than the independent growth of units under competitive business environment. Such situation was continued up to the mid of 1991. Under the regime of economic liberalization, the focus was shifted from "protection" to "competitive promotion". The public policy in India had been attaching lot of importance to village and SSI on the following grounds. SSI being labor-intensive, helped to increase the volume of employment, particularly in rural areas, it is estimated that about two crore persons are engaged in India in these industries.

The policies of liberalization, globalization and marketisation brought out fundamental changes in the business environment in which industries operate. This changed the market structure, character and focus of marketing strategies. The changed economic environment has forced Indian corporate to cope up with economic liberalization and globalization policies of the globe. In India too, the entry of MNCs has been promoted and encouraged while impacts of MNCs on business and industrial development have resulted in increased competition and equity participation in manufacturing, processing and marketing of goods and services.

The SSI today is immense for the growth of the country. Small scale industries are the industries which are run with the help of their labours and which also use some simple machine and power. The investment scale in this industry varies from 50 lakh to 1 crore for fixed assets. In India these type of industries are permuted to meet with the problem of excess population and unemployment so the government of India prate entrepreneur to step up small scale industries by aiding him by giving loans, land, guidance etc. The strategy adopted by the government is:-

- Public entrepreneurship should remain confined only to those industries and sector where private enterprise, individual or corporate is generally not attracted.
- There is need to development management education and industrial training.
- The development of backward area constitutes a new challenge. Program for their development be drawn up and should be effectively implemented.
- Economic administration by the state should be improved and made more effective so that economic policy may achieve their objectives in the overall interest of the economy.
- Financial institutions should provide adequate and timely credit and technical assistance to SME.

ROLE OF SMALL-SCALE INDUSTRIES IN INDIA

All industrial units with a capital investment of not more than Rs. one crore are, at present, treated as small-scale units. It may be noted that capital investment covers only investments in plant and machinery whereas land and factory buildings are excluded. The small-scale industries contribute a lot to the progress of the Indian economy. They have also a great potential for the future development of the economy. The following are the opportunities created by strong small scale industries;

Large Scope for Employment

The small-scale industries provide large scope for employment on a massive scale. In 2001 the employment generated in this sector was 19.2 million. This is of great significance for a country like India which is a labour-surplus economy, and where labour-force is increasing at a very rapid rate. Moreover, the small-scale industries being labour-intensive they employ more labour per unit of capital for a given output compared to the large-scale industries. This is evident from the fact that the small-scale sector accounts for as much as 80% of the total employment in the industrial sector.

SESSION I



Large Production

The small-scale industries also contribute a sizeable amount to the industrial output of the country. Out of the total output of the manufacturing sector, as much as 40% comes from these industries. And out of the total supplies of industrial consumer goods a major part originates in the small-scale sector. The adequate availability of consumer goods plays an important role in stabilizing and developing the economy.

Large Exports

Many products of the small-scale industries like handloom cotton fabrics, silk fabrics, handicrafts, carpets, jewellery, etc. are exported to foreign countries. Their share in the total exports is as much as 40%. In this way the small-scale sector makes a very valuable contribution to the accumulation of foreign exchange resource of the country.

Use of Latent Resources

The small-scale industries used resources which are available locally or which would otherwise have remained unused. These resources are the hoarded wealth, family-labour, artisan's skills, native entrepreneurship, etc. Being thinly spread throughout the country, these resources cannot be used by large-scale industries which need them in big amounts and at a few specified places.

Promoting Welfare

The small-scale industries are also very important for welfare reasons. People of small means can organize these industries. This in turn increases their income-levels and quality of life. As such these industries help in reducing poverty in the country. Further, these industries tend to promote equitable distribution of income. Since income gets distributed among vast number of persons throughout the country, this help in the reduction of regional economic disparities.

Table 1: Position of SSI's in India

SSIs In India		
• Estimated No. of Units		3.57 Million
• Employment		19.96 Million
• Share in Industrial Value Added		39%
• Share in total exports	Direct	45%
	Overall	34%
• Total Number of Items Produced		Over 8000
• Number of Reserved Items		675
		<i>(Figures for 2002-2003)</i>

Table 2: Exports from Small Scale Sector

Item	Year					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Total Exports (Rs. Crore)	202510	207769	252137	291582	375339.52	456417.88
Exports from SSI Sector (Rs. Crore)	69797	71244	86013	97644	124416.56	150242.03
Share of SSI sector in total exports (%)	34.47	34.29	34.03	33.49	33.15	32.92
Growth rate in Exports (%)	28.78	2.07	20.73	13.52	27.42	20.76

Importance of SSI's

Since the time of independence, the small scale sector in India has been a major contributor to country's Gross Domestic product (GDP). This traditional sector in India is considered to have huge growth prospect with its wide range of products. With 40 per cent share in total output and 35 per cent shares in exports, the small scale industrial sector in India is acting as engine of growth in the new millennium.

As per the latest definition which is effective since December 21, 1999, for any industrial unit to be regarded as small scale Industrial Unit the following condition to be satisfied:- Investment in fixed assets like plant and equipments either held on ownership terms on lease or on hire purchase should not be more than Rs.10 million.

However the unit in no way can be owned or controlled or ancillary of any other industrial unit.

The traditional small scale industries clearly differ from their modern counterparts in many respects. The traditional units are highly labour consuming with their old-age machineries and conventional techniques of production resulting in poor productivity rate whereas the modern small scale units are much more productive with less manpower and more sophisticated equipments.

Nowadays Indian small scale industries (SSI'S) are mostly modern small scale industries. Modernization has widened the list of products offered by this industry. The items manufactured in modern small scale service & Business enterprises in India now include rubber products, plastic products, chemical products, glass and ceramics, mechanical engineering items, hardware, electrical items, transport equipment, electronic components, automobile parts, bicycle parts, instruments, sports goods, stationary items and clocks and watches.

Table 3: Performance of Micro & Small Enterprises

Year	Number of Enterprises (Lakh Nos.)			Empl. (Lakh Person)	Production (Rs. Crs.) at Current Prices	Growth Rate (%)	Share In GDP (%)
	Registered	Unregistered	Total				
2002-2003	15.91	93.58	109.49	263.49	314850	8.68	5.92
2003-2004	16.97	96.98	113.95	275.30	364547	9.64	5.79
2004-2005	17.53	101.06	118.59	287.55	429796	10.88	5.84
2005-2006	18.71	104.71	123.42	299.85	497842	12.32	5.83
2006-2007	20.98	107.46	128.44	312.52	587196	12.65	5.94
2007-2008 (Projected)	24.68	108.99	133.67	322.28	695126	13.00	NA

Source: Development Commissioner Micro, Small and Medium Enterprises, Govt. of India

The small-scale industries, despite their importance for the economy, are not contributing to their full towards the development of the country. It is because these industries are beset with a number of problems in regard to their operations. Few of these problems are discussed below:

Inadequate Finance

A serious problem of these industries is in respect of credit, both for long-term and short-term purposes. This is evident from the fact that the supply of credit has not been commensurate with their needs associated with fixed and working capital. Very often the credit has not been timely. Its delayed availability has been a major factor in causing much of industrial sickness in this sector. The credit situation is particularly hard for the very small or tiny units.

Difficulties of Marketing

The small-scale industries also faced the acute problem of marketing their products. The problems arises from such factors as small scale of production, lack of standardization of products, inadequate market knowledge, competition from technically more efficient units, deficient demand, etc. Apart from the inadequacy of marketing facilities, the cost of promoting and selling their products too is high. The result is large and increasing subsidies which impose heavy burden on the government budgets.

Shortage of Raw Materials

Then there is the problem of raw materials which continues to plague these industries. Raw materials are available neither in sufficient quantity, nor of requisite quality, nor at reasonable prices. Being small purchasers, the producers are not able to undertake bulk buying as the large industries can do. The result is taking whatever is available, of whatever quality and at high prices. This adversely affects their production, products, quality and costs.

Low-Level Technology

The methods of production which the small and tiny enterprises use are old and inefficient. The result is low productivity, poor quality of products and high costs. The producers for lack of information, know very little about modern technologies and training opportunities which concerns them. There is little of research and development in this field in the country.

Competition from Large-Scale Industries

Another serious problem which these industries face is that of competition from large-scale industries. Large-scale industries which uses the latest technologies with access to many facilities in the country can easily out-priced and out-sell the small producers. With the liberalization of the economy in recent years, this problem has become all the more serious.

For all these reasons, the small producers of small-scale industries find themselves in a very precarious position.

Bottom of Form



Fig. 1 (Contd.)...

...Fig. 1 (Contd.)



Source: Ministry of Small Scale Industries.

Fig. 1: Trends in the Small Scale Enterprises of India

STRATEGIES FOR REVIVAL OF SSIS

1. To encourage private and govt. participation in industrial and social development.
2. To create industrial friendly atmosphere for industry.
3. Developing necessary infrastructure.
4. Creation of an industrial estate infrastructure Development fund which should be at the disposal of a committee comprising of entrepreneurs.
5. Purchase of technology and provision of common facility centers must be managed through ASIDE scheme.
6. Publicity should be made through an interactive website by the greater use of information technology.
7. Small scale and tiny units should be exempted from land use change charge for change of agriculture land to industrial purpose.
8. Stamp duty must be admissible to Industrial Estates of UPSIDC as applicable to the plots of Industrial Estates of Directorate of Industries.
9. Policy guidelines must be to ensure cluster based industrial development.
10. A system of providing testing and certification facilities to small scale and tiny units, especially those which want to contribute in the filed of exports, should be established by the Government.
11. Adequate steps must be adopted to sustain and strengthen the traditional knowledge, skills and capabilities of weavers, to revitalize the institutional structure to enrich human resource skills and capabilities;
12. There is almost a total vacuum in the field of reliable data in the handloom sector making it imperative to establish an effective MIS for the sector. Giving priority to this work, adetailed database have to be collected containing following information:-
 - a. Weavers and weaver families;
 - b. Handloom clusters;
 - c. Product varieties and regional traditions;
 - d. Details of supplier of raw-materials;
 - e. Designs, patterns and other intellectual properties;
 - f. List of exporters;
 - g. List of buyers;
13. The rates of trade tax on raw material for handloom industry must be rationalized after studying rates prevailing in other states.
14. Dyes and chemicals are supplied through National Handloom Development Corporation. AZO free dyes and eco-friendly colors and chemicals should be encouraged through direct purchase.
15. States should be identified for herbal plants, pottery, leather; food processing and handicraft units and they should be provided integrated facilities of product development, new designs, marketing, raw material and technology.

16. An Export Processing Loan Fund has to be created to export products of handmade paper industry. Marketing of khadi & village industry products for foreign tourists, especially on Buddhist Tourism Circuit must be ensured.
17. Special facility must be provided for establishment of khadi & village industry units for SC, ST, OBC, women and ex-servicemen.
18. Loan should be provided to khadi & village industries in rural areas, especially in the programmes of development of new infrastructure facilities, from the banks without any security/ collateral security as recommended by RBI in its circular issued in January 2009.
19. A close supervision and follow up is necessary to take corrective steps at the appropriate time.

Following suggestions can be considered for avoiding or tackling the problems of SMEs,

- Proper appraisal of the Project.
- Implementation of the Project according to the time schedule.
- Disbursements of funds according to the requirement of the project.
- Modernization / Expansion / Diversification of the project.
- Detection of sickness and taking corrective steps at the incipient stage.

Source: Govt. of India

A survey was conducted by ASSOCHAM in 2009 concerning the contribution of Small and Medium Enterprises (SMEs) to Gross Domestic Product (GDP) in India. It was revealed that the contribution towards the GDP is expected to rise to 22 percent by 2012. Their contribution to GDP was about 17 percent in 2009. The reason for this would be the technological up-gradation and further increase in production. It was studied that more than 60% of the SMEs had been using advanced technology. This would help in increase in production with low input costs. The other reason for the growth is liberalization and deregulation. The estimation of study reported that the growth rate of SMEs was 35 percent at the time of 2007. It is expected to grow at the rate of 40% in the next five years. The contribution of SMEs to the exports of the country was found to be 40% in 2009. It was estimated by the survey that the contribution to exports would rise to 44% by 2012.

CONCLUSION

The last quarter of the 20th Century will be remembered for the massive changes that have transformed the world. Technological change has influenced every walk of life be it manufacturing or services, private or public, domestic or multinationals. During the globalization process, most economies undertook policy changes. The process was initiated by the introduction of 'New Economic Policy' in 1991. Change in an organization involves altering its structure, process, the behaviour of its management and staff, by its strategy, the environment, and so on. The organization's structure is perhaps one of the most common targets of change. Non-availability of credit facilities and high interest rates were found to be major problems for SMEs. Absence of skilled manpower, improper implementation of labor laws, and lack of adequate market information are also some of the problems accounted by SMEs. An absence of well researched database concerning market intelligence or technology is another issue that is being faced by the SMEs and needs immediate correction.

Table 1: Position of SSI's in India

SSIs in India		
• Estimated No. of Units		3.57 Million
• Employment		19.96 Million
• Share in Industrial Value Added		39%
• Share in total exports	Direct	45%
	Overall	34%
• Total Number of Items Produced		Over 8000
• Number of Reserved Items		675
<i>(Figures for 2002-2003)</i>		

Table 2: Exports from Small Scale Sector

Item	Year					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Total Exports (Rs. Crore)	202510	207769	252137	291582	375339.52	456417.88
Exports from SSI Sector (Rs. Crore)	69797	71244	86013	97644	124416.56	150242.03
Share of SSI sector in total exports (%)	34.47	34.29	34.03	33.49	33.15	32.92
Growth rate in Exports (%)	28.78	2.07	20.73	13.52	27.42	20.76

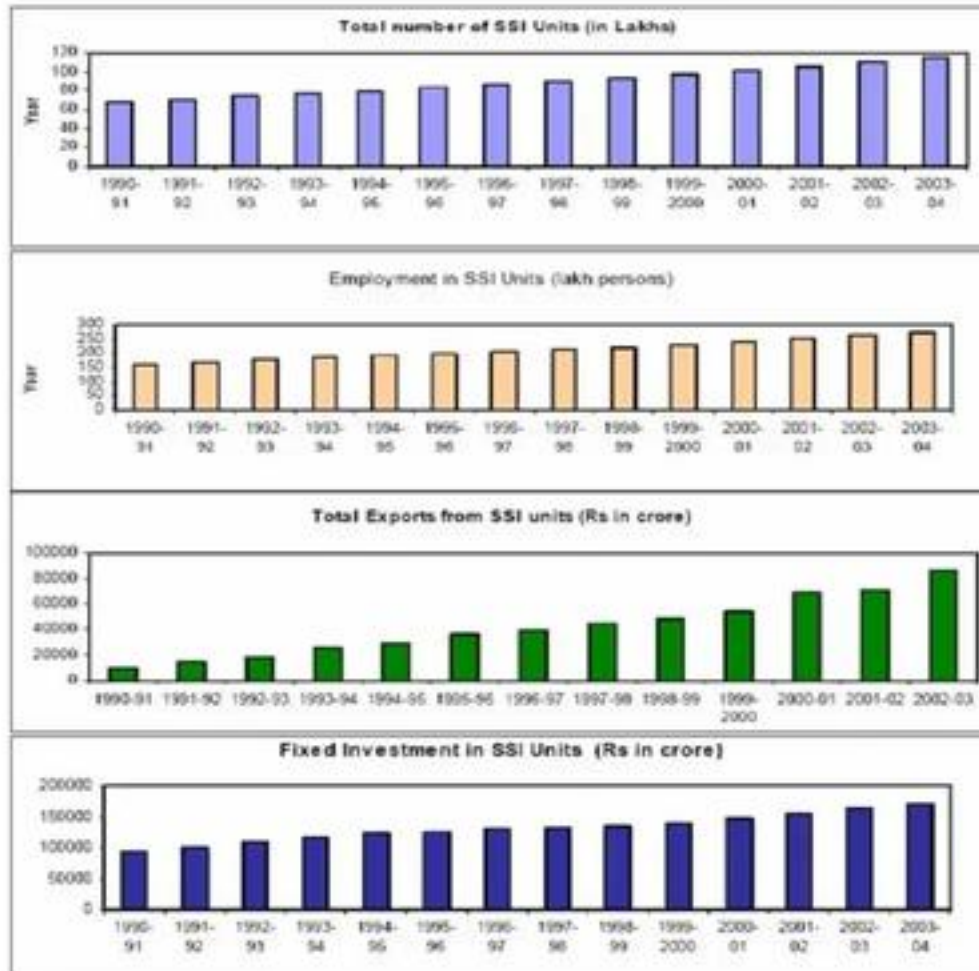
Table 3: Performance of Micro & Small Enterprises

Year	Number of Enterprises (Lakh Nos.)			Empl. (Lakh Person)	Production (Rs. Crs.) at Current prices	Growth Rate (%)	Share In GDP (%)
	Registered	Unregistered	Total				
2002-2003	15.91	93.58	109.49	263.49	314850	8.68	5.92
2003-2004	16.97	96.98	113.95	275.30	364547	9.64	5.79

2004-2005	17.53	101.06	118.59	287.55	429796	10.88	5.84
2005-2006	18.71	104.71	123.42	299.85	497842	12.32	5.83
2006-2007	20.98	107.46	128.44	312.52	587196	12.65	5.94
2007-2008 (Projected)	24.68	108.99	133.67	322.28	695126	13.00	NA

Source: Development Commissioner Micro, Small and Medium Enterprises, Govt. of India

Table 4: Trends in the Small Scale Enterprises of India



Source: Ministry of Small Scale Industries.

REFERENCES

- [1] Annual Report (2000-01) Ministry of small scale Industries and Agro & Rural Industries, Government of India, New Delhi.
- [2] Ashok kumar Singh (1970), "Problems and prospects of small scale industries in Bihar: A critical study" PhD, Thesis, Bihar University.
- [3] Government of India, Planning Commission 1970, Report of the committee on village and SSI (Chairman) D.G. Karve
- [4] Interim report of the study group on Development of small Enterprises small industries Development organization, New Delhi.
- [5] Mathew P.M. (1970), Small Enterprises and Regional Development, Challenges and Choices, Kanishka Publishers – Distributors, New Delhi, P. 32.
- [6] Nisar Ahmad (1970), "Problems and management of small scale and cottage Industries" New Delhi, Deep and Deep publication.
- [7] Small Industries Extension training (SIET) 1972, A study of National small Industries Corporation in Hire – purchase scheme, Hyderabad, SIET Institute.
- [8] The IUP Journal of Entrepreneurship Development, December 2010 Vol. VII No.4
- [9] <www.indianblogger.com>
- [10] <www.ssi.india.com>
- [11] <www.ssi.com>
- [12] <www.assochem.org>

Restructuring the Rural Economic System—The Turnaround Phase of Regional Rural Banks

Megha Bhatia¹ and Manjula Jain²

¹Senior Lecturer, IFTM University

²Director, School of Business Management, IFTM University

Abstract—Regional Rural Banks (RRBs) were established under the provision of an ordinance promulgated on the 26th September, 1975 and the RRB Act, 1976 with an objective to ensure sufficient institutional credit for agriculture and other rural sectors. Reforms and mergers introduced by the Government of India in consultation with Reserve Bank of India (RBI) and National Bank for Agriculture and Rural Development (NABARD) in the years 1994-95 to 2005-06 have yielded positive results in respect of key performance indicators such as number of banks and branches, capital composition, deposits, loans and the trend of investments. With the requisite strength having been developed, RRBs are the best suited vehicles to widen and deepen the process of financial inclusion. RRBs may be provided adequate developmental and promotional assistance to contribute substantially to financial inclusion so that the business generated out of those efforts may add positively to their performance.

Keywords: Rural Credit Market, Performance of RRBs, State Governments, Reserve Bank of India

INTRODUCTION

Regional Rural Banks (RRBs) set up in 1975 were mandated to make available financial services, especially, credit services to the rural poor. However, later on their structural, organisational and managerial weaknesses raised issues relating to their effectiveness as also sustainability which necessitated a number of policy initiatives including doses of recapitalization for broad basing their operations. Most of the RRBs had responded well to these initiatives by wiping off their losses and posting profits. However, concerns about their role in the rural economy could not be sufficiently addressed by the reform process, initiated since 1995-96. Their share in total institutional rural credit remained constant at nine per cent for almost two decades of their existence. They remained relatively small entities, co-existing with multiple players and lacked the focus required for being aligned to the economic needs of the rural population. Against this backdrop, amalgamation of RRBs into larger entities was initiated from September 2005. The institutions so emerged after amalgamation were expected to have a stronger presence and capabilities to provide sustained financial and developmental services to the rural sector.

As a result of the amalgamation, the number of RRBs has been reduced from 196 as on 31 March 2005 to 96 as on 31 December 2007. The immediate challenge that emerged out of the amalgamation process has been one of cultural and emotional integration of the erstwhile units into a new entity. The other challenges that were thrown up include business development, diversification of loan portfolio, taking up newer business avenues, enhancing outreach through use of technology and the reported reluctance of the staff to move out of the comfort zone of their own erstwhile operational area. Post amalgamation; while the load, nature and urgency of work in RRBs have all undergone changes, the staff strength and quality of staff of most of RRBs have remained almost the same. A need was, therefore, felt to take up immediately capacity building efforts to enable them to tackle the immediate challenges.

LITERATURE REVIEW: RRB'S AT A GLANCE

The literature available in the working and performance of RRBs in India is very limited in its coverage. However, the literature obtained by investigators in the form of reports of various committees, commissions and working groups established by the Union Government, NABARD and Reserve Bank of India, the research studies, articles of researchers, bank officials, economists and the comments of economic analysts and news is briefly reviewed in this part.

Patel and Shete (1980) of the National Institute of Banking Management made a valuable analysis of performance and prospects of RRBs. They also gave a comparative picture of performance in deposits, branch expansion and credit deployment of the co-operative banks, commercial banks and RRBs in a specified area. This was an eye opener for many researchers engaged in this field of rural credit.

NABARD (1986) published "A study on RRBs viability", which was conducted by Agriculture Finance Corporation in 1986 on behalf of NABARD. The study revealed that viability of RRBs was essentially dependent upon the fund management strategy, margin between resources mobility and their deployment and on the control exercised on current and future costs with advances. The proportion of the establishment costs to total cost and expansion of branches were the critical factors, which affected their viability. The study further concluded that RRBs incurred losses due to defects in their systems as such, there was need to rectify these and make them viable. The main suggestions of the study included improvement in the infrastructure facilities and opening of branches by commercial banks in such areas where RRBs were already in function.

Kalkundrickars (1990) in his study on "Performance and Growth of regional Rural Banks in Karnataka" found that these banks had benefited the beneficiaries in raising their income, productivity, employment and use of modern practices and rehabilitate rural artisans.

Kumar Raj (1993) carried out a study on the topic "Growth and Performance of RRBs in Haryana". On the basis of the study of RRBs of Haryana, it is found that there was an enormous increase in deposits and outstanding advances. The researcher felt the need to increase the share capital and to ensure efficient use of distribution channels of finance to beneficiaries.

A.K. Jai Prakash (1996) conducted a study with the objective of analyzing the role of RRBs in Economic Development and revealed that RRBs have been playing a vital role in the field of rural development. Moreover, RRBs were more efficient in disbursement of loans to the rural borrowers as compared to the commercial banks. Support from the state Governments, local participation, and proper supervision of loans and opening urban branches were some steps recommended to make RRBs further efficient.

L.K. Naidu (1998) conducted a study on RRBs taking a sample of 48 beneficiaries of rural artisans in Cuddapah district of Andhra Pradesh state under Rayale Seen Gramin Bank. In this study, it was concluded that the beneficiaries were able to find an increase in their income because of the finance provided by the bank.

According to **Nathan, Swami (2002)**, policies of current phase of financial liberalization have had an immediate, direct and dramatic effect on rural credit. There has been a contraction in rural banking in general and in priority sector lending and preferential lending to the poor in particular.

Chavan and Pallavi (2004) have examined the growth and regional distribution of rural banking over the period 1975-2002. Chavan's paper documents the gains made by historical underprivileged region of east, northeast and central part of India during the period of social and development banking. These gains were reversed in the 1990s: cutbacks in rural branches in rural credit deposits ratios were the steepest in the eastern and northeastern states of India.

Professor Dilip Khankhoje and Dr. Milind Sathye (2008) have analysed to measure the variation in the performance in terms of productive efficiency of RRBs in India and to assess if the efficiency of these institutions has increased post-restructuring in 1993-94.

STAGES OF DEVELOPMENT OF RRBS

1975-1986—Expansion Phase

1986-1995—Declining Phase

1995-2006—Turnaround Phase

As noted in the Narsimham Committee, the first five RRBs were established on 2nd October 1975. By December 1979, 60 RRBs were established with 2,420 branches having total deposits of Rs. 123.22 crore and loan outstanding of Rs. 161.41 crore. By the end of December 1980 RRBs gained momentum and 85 RRBs were set up with 3,279 branches. By December 1987, 196 RRBs with 13,353 branches came into being with deposits amounting to Rs. 2305.82 crore in 224 lakh accounts and loans of Rs. 2232.26 crore in 93 lakh accounts.

Although RRBs had a rapid expansion of branch network and increase in volume of business, these institutions went through a very difficult evolutionary process due to the following problems.

- Very limited area of operation
- High risk due to exposure only to target group
- Public perception that RRBs are poor man's bank
- Mounting losses due to non-viable level of operations in branches located at resource-poor areas.
- Heavy reliance on sponsor banks for investment avenues with low returns.
- Inadequate skills in treasury management for profit orientation.
- RRB hampered by an across-the-board ban on recruitment of staff.
- Serious undermining of the board by compulsions to look to sponsor banks, GOI, NABARD and Reserve Bank of India (RBI) for most of the decisions.

Amalgamation of RRBS

In 2005-06, the Government of India initiated the process of structural consolidation of RRBs by amalgamating RRBs sponsored by the same bank within a State as per the recommendations of the Vyas Committee (2004).

The amalgamated RRBs were expected to provide better customer service due to better infrastructure computerization of branches, pooling of experienced work force, common publicity, marketing efforts etc., and also derive the benefits of a large area of operation, enhanced credit exposure limits and more diverse banking activities. As a result of the amalgamation, the number of RRBs was reduced from 196 to 86 as on 31st March, 2009. Thus, under the amalgamation process, 145 RRBs have been amalgamated to form 45 new RRBs.

To strengthen RRBs and improve their performance many initiatives have been taken by the Government of India and the Reserve Bank of India (RBI). As part of the comprehensive restructuring programme, recapitalization of RRBs was initiated in the year 1994-95. The process continued till 1999-00 and covered 187 RRBs with aggregate financial

support of Rs.2188.44 crore from the shareholders, viz., Government of India, State Governments and sponsor Banks in the ratio of 50:15:35. Further, the branch licensing policy for RRBs has been liberalized. Under the new norms, empowered committees at the regional offices of RBI clear RRB application to open new branches.

RESULTS AND DISCUSSIONS

Trend in the growth of RRBs

Till the birth of RRBs in India, Commercial Banks and Co-operative Banks were rendered services to the rural public. But despite such large net work of bank branches, the credit needs of the rural population in India were quite inadequate. Regional Rural Banks in India have achieved tremendous growth in terms of number of banks and its wide branches which is shown in the Table-1

Table 1: Growth of Regional Rural Banks in India

Years	Number of RRBs	Number of Branches
2001-02	196	14,390
2002-03	196	14,433
2003-04	196	14,446
2004-05	133	14,484
2005-06	94	14,494
2006-07	90	14,520
2007-08	90	14,761
2008-09	86	15,181
2009-10	82	15,475
2010-11	82	16,001

Source: Central Statistical Information Department, NABARD, June-2011.

District Coverage and Staff Employed

Regional Rural Banks (RRBs) were established in India essentially for taking banking to the doorsteps of rural masses, particularly in areas without banking facilities. RRB is a bank for rural poor people; its presence in all the states of country especially in underdeveloped states and union territories is strongly realized. RRBs covered 525 out of 605 districts as on 31st March, 2006. After amalgamation, RRBs have become quite large covering most parts of the states in India. Year-wise coverage of districts and number of branches are given in Table-2

Table 2: Coverage of Districts and Manpower Deployment

Years	Number of Districts Covered	Number of Staff Employed
2001-02	511	69,876
2002-03	516	69,547
2003-04	518	69,249
2004-05	523	68,912
2005-06	525	68,629
2006-07	534	68,289
2007-08	594	68,005
2008-09	616	68,526
2009-10	618	68,945
2010-11	620	69,475

Source: Central Statistical Information Department, NABARD, June-2011.

CAPITAL COMPOSITION

RRBs occupy an important position in the rural credit market of India. The rationale for establishment of the RRB was to mobilize deposits, access to central money market and modernized outlook, which the commercial banks have. Sound financial position is essential for any organization to survive to render the services to the society. RRBs have both types of capital i.e., owned and borrowed. The detailed components of capital funds are furnished in Table-3

Table 3: Components of Total Capital /Funds (Rs Crore)

Years	Owned Funds	% To Total Funds	Borrowed Funds	% To Total Funds	Total Funds
2001-02	4,059	47.30	4,524	52.70	8,583 (100%)
2002-03	4,666	49.30	4,799	50.70	9,465 (100%)
2003-04	5,438	54.20	4,595	45.80	10,033 (100%)
2004-05	6,181	52.80	5,524	47.20	11,705 (100%)
2005-06	6,647	47.65	7,303	52.35	13,950 (100%)
2006-07	7,286	42.70	9,776	57.30	17,062 (100%)
2007-08	8,733	43.17	11,494	56.83	20,227 (100%)
2008-09	10,910	46.14	12,736	53.86	23,646 (100%)
2009-10	12,247	48.17	18,770	57.73	31,017 (100%)
2010-11	13,839	52.80	26,491	54.45	40,330(100%)

Source: Central Statistical Information Department, NABARD, June-2011.

Deposits and Loans Outstanding of RRBs

RRBs are expected to mobilize resources from rural areas and play a significant role in developing agriculture and rural economy by deploying mobilized resources in rural sectors for the needy not converted by other formal credit institutions. The businesses performance of RRBs in terms of deposit mobilization and credit extension is presented in Table-4.

Table 4: Deposits and Loans Outstanding of RRBs in India (Rs.Crore)

Years	Deposits	Loans
2001-02	44,539	18,629
2002-03	50,098	22,158
2003-04	56,350	26,114
2004-05	62,143	32,870
2005-06	71,329	39,713
2006-07	83,144	48,493
2007-08	99,093	58,984
2008-09	1,20,189	67,802
2009-10	1,45,035	79,157
2010-11	1,66,232	98,917

Source: Central Statistical Information Department, NABARD, June-2011.

C-D Ratio in India

The RRBs were conceived to develop rural economy by providing credit and other facilities for the purpose of development of agriculture, trade and other productive activities to the targeted poor people. The credit deposit ratio of the bank indicates the creation of credit out of the deposits mobilized by the banks which has been furnished in Table-05.

Table 5: Credit Deposits Ratio of RRBs in India (%)

Years	CD Ratio
2001-02	41.8
2002-03	44.2
2003-04	46.3
2004-05	52.8
2005-06	55.6
2006-07	58.3
2007-08	59.5
2008-09	56.4
2009-10	57.1
2010-11	59.69

Source: Central Statistical Information Department, NABARD, June-2011.

Growth of Investment

Table 6: Growth of Investments of RRBs in India (Rs. Crore)

Years	Amount of Investment	% Of Increase over Previous Year
2001-02	30,532	---
2002-03	33,063	8.28
2003-04	36,135	9.29
2004-05	36,762	1.73
2005-06	41,182	12.02
2006-07	45,666	10.88
2007-08	48,560	6.33
2008-09	65,910	35.72
2009-10	79,379	8.30
2010-11	86,510	8.98

(Source: Central Statistical Information Department, NABARD, June-2011.

Investment as a window of deployment of funds was given more emphasis than lending. The year-wise investment made by the banks is presented in Table-06.

MAJOR OBSERVATIONS

1. RRBs were established "with a view to developing the rural economy by providing, for the purpose of development of agriculture, trade, commerce, industry and other productive activities in the rural areas, credit and other facilities, particularly to small and marginal farmers, agricultural laborers, artisans and small entrepreneurs, and for matters connected therewith and incidental thereto"(RRBs Act, 1976).

2. It is very clear from the table 1 that the number of RRBs decreased from 196 in the year 2001-02 to 86 in 2008-09. This was due to the amalgamation that took place in the year 2005-2006, covering 525 districts with a net work of 14,494 branches. However, the number of branches has been significantly increased from 14,390 in 2001-02 to 15,181 in 2008-09. The increase over the period was 1.05 times. As a result of the amalgamation, the number of the RRBs has been reduced from 196 to 82 as on 31 March 2011. The number of branches of RRBs increased to 16001 as on 31 March 2011 covering 620 districts throughout the country.
3. Significant improvement in the performance of RRBs was witnessed over the period of study in terms of number of districts covered. RRBs covered 511 districts as on 31st March, 2002 increased to 616 as on 31st March, 2009. The increase over the period was 1.20 times. However, the human resources employed by RRBs have been considerably decreased year by year owing to the efficiency of the bank.
4. Table-3 reveals that the year-wise components of total capital comprises of owned funds and borrowed funds of RRBs in India. Both the owned funds and borrowed funds have constantly been increased over the period of study. It is important to observe from the above table that the borrowed funds constitute more percentage than the owned funds during the post-merger period especially the year 2005-2006 onwards. The owned funds of RRBs comprising of share capital, share capital deposits received from the shareholders and the reserves stood at ₹ 13839 crore as on 31 March 2011 as against ₹ 12247 crore as on 31 March 2010; registering a growth of 13.0%.
5. RRB' is showing considerable improvement in their credit and deposits performance. The deposits mobilized by the bank has been increased from Rs.44, 539 crore in the year 2001-02 to Rs.1, 20,189 crore in 2008-09. The increase over the period was 2.7 times. Loans outstanding of the RRBs also highlighted the significant improvement as it has been increased from Rs.18,629 crore in the year 2001-02 to Rs.67,802 crore in 2008-09. The increase over the period of the study was 3.6 times.
6. The table exhibits that CD ratio increased from 41.8 in the year 2001-02 to 56.4 in 2008-09. There has been consistent growth in the sphere of credit deposit ratio. The year 2007-08 registered a higher rate i.e., 59.5%. The aggregate CDR of RRBs increased over the years from 41.83% as on 31 March 2002 to 59.5% as on 31 March 2011. Eight of the RRBs reported CDR of more than 100%.
7. There has been consistent growth in the sphere of investment activity. It has been observed from the above table that the amount of investment of the bank has been increased from Rs 30,532 crore in the year 2001-02 to Rs 65,910 crore in 2008-09. The year 2008-09 registered at a highest percentage. The investment of RRBs increased from ₹ 79379 crore as on 31 March 2010 to ₹ 86510 crore as on 31 March 2011 registering an increase of 8.98%. SLR investments amounted to ₹ 45022 crore where as non-SLR investments stood at ₹ 41488 crore. The Investment Deposit Ratio (IDR) of RRBs progressively declined over the years from 72% as on 31.3.2001 to 52.04% as on 31 March 2011.

CONCLUSION

As per the context and applications, the term 'performance' may have different connotations. In the present study, the performance of Regional Rural Banks, an attempt has been made to analyze the performance in terms of certain defined parameters like number of branches, district covered, capital funds, and mobilization of deposits, loans and investments made by these banks. The performance of RRBs in India improved in the post-merger period. Even though number of RRBs decreased, the branch net work has been increased. During post-merger period, there has been increased number of districts covered by the RRBs. Total capital funds have been increased tremendously after amalgamation took place in the year 2005-06. Credit-deposit ratio has been increased over the years showing that a remarkable deployment of credit by these banks in rural areas. However, it is the responsibility of the bank management and the sponsored banks to take the change for corrective steps to raise the credit-deposit ratio of the bank. The gap between CD ratio of commercial banks and the RRBs need to be minimized. With a view to facilitate the seamless integration of RRBs with the main payment system, there is a need to provide computerization support to them. RRBs should extend their services in to un-banked areas and increase their credit-deposit ratio. The process of merger should not proceed beyond the level of sponsor bank in each state. The findings may be of considerable use to rural banking institutions and policy makers in developing countries and to academic researchers in the area of banking performance evaluation.

REFERENCES

- [1] Avkiran, N. K., (1999), "The Evidence of Efficiency Gains: The role of mergers and the benefits to the public," *Journal of Banking and Finance* 23, pp. 991-1013.
- [2] Government of India Report of the Committee on Rural Banks, (Chairman-M, Narasimhan), New Delhi, 1975.
- [3] Gupta, R.V., (1998) Report of the High-Level Committee on Agricultural Credit through Commercial Banks. Reserve Bank of India, Mumbai.
- [4] IBA (Indian Banks' Association), (1999). Performance Highlights of Banks, 1997-98, Indian Banks Association, Mumbai.
- [5] Narasimhan Committee. (1991). Report of the Committee on the Financial System, Government of India.
- [6] Parliament of India (Loksabha), (2004). Motion for consideration of 'The Regional Rural Banks (Amendment) Bill, 2004.
- [7] Second Narasimhan Committee. (1997). Committee on Banking Sector Reform, Gazette of India-Extraordinary
- [8] Notification, Part II, Sec 3 (ii), Ministry of Finance, Government of India.
- [9] Thakur, S., (1990), "Two Decades of Indian Banking: The Service Sector Scenario," Chanakya Publications New Delhi, India.
- [10] Tyagarajan, M., (1975), "Expansion of Commercial Banking- An Assessment," *Economic and Political Weekly*, 10, pp. 1819-1824

Impact of Globalization on Indian Rural Market

Madhulika Dutta¹ and Manjula Jain²

¹Asst. Prof, IFTM University

²Director, School of Business Management, IFTM University

Abstract—There has been a significant change in the Indian economy since globalization. Today, globalisation has become a buzzword due to the results that our economy has reaped in the last two decades. Standard of living, income, taste and preference, education, consumption pattern etc have reflected a significant growth in last few years. This change is more vigilant in the heart of India. Rural market in India is composed of 742 million people and is by far the largest potential market in the world. The annual rural household income of Rs. 63, 500 (as per NCAER, IMDR-2006) coupled with changing rural aspirations in consumption patterns and lifestyle unfolds tremendous opportunities for rural marketing. Therefore we can say that the days are gone when it was difficult to find brand in rural India. Rural markets rather are becoming the most attractive destination for leading MNCs to place their brands. Some of the major market players committed a mistake by underestimating the Indian rural markets and their misconception has lead to their failure also. HLL and ITC are two major multinational corporations that took the lead in the rural area by either molding the product or package as per the needs and specification of the rural customer.

Keywords: Globalization; Indian Rural Market

RATIONALE BEHIND THE PAPER

As change came in 1991 when government took a series of bold initiatives to take the economy away from controls. The programme included for reaching trade fiscal marketing and industrial policy measures with a major thrust on improvement of competitive efficiency of Indian industries by utilizing foreign investment and technology to a much greater degree than in the past. Moreover the new reform measures ended the regime of licensing and controls and made the industry virtually independent. Significantly the new policy permitted the free import and export of virtually all products with some exceptions.

METHODOLOGY

It is defined as a way to systematically solve the research problem. The paper is based on secondary data which make use of the published material on Rural Markets generated by the Census Reports and other sources. Basic information about the Impact of Globalisation on Rural markets has been obtained from various books and journals. Indian economy started witnessing the impact of Globalisation after the introduction of LPG policy in the year 1991. Different sectors of the economy started reaping the benefits of globalisation and rural market was no exception. The paper thus focuses upon the changes and developments that took place in the rural markets in the post liberalization era.

REVIEW OF LITERATURE

The rural scene is now undergoing a sea-change, resulting from the multi-pronged activities undertaken for the overall development of rural areas. The recent economic policy initiatives of the government have resulted in increased investments in the corporate sector by domestic as well as overseas investors. The growth of the corporate sector means increased production and this in turn requires identification and penetration into high growth potential markets. In this context rural markets have good prospects for most of the goods and services of this liberalized economy. It also indicates that the twenty first century is going to see the full blossoming of the Indian rural market (Chahal and Pal 1997 p 223).

OPPORTUNITY

The Indian rural market with its vast size and demand base offers a huge opportunity that MNCs cannot afford to ignore. With 128 million households, the rural population is nearly three times the urban. As a result of the growing affluence, fuelled by good monsoons and the increase in agricultural output to 200 million tons from 176 million tons in 1991, rural India has a large consuming class with 41 per cent of India's middleclass and 58 per cent of the total disposable income.

The importance of the rural market for MNCs is underlined by the fact that the rural market accounts for close to 70 per cent of toilet-soap users and 38 per cent of all two-wheeler purchased. The rural market accounts for half the total market for TV sets, fans, pressure cookers, bicycles, washing soap, blades, tea, salt and toothpowder.

CRITICAL ASSESSMENT

Globalisation has brought in new opportunities to developing countries. Greater access to developed country markets and technology transfer hold out promise improved productivity and higher living standard. But globalisation has also thrown up new challenges like growing inequality across and within nations, volatility in financial market and environmental deteriorations. Another negative aspect of globalisation is that a great majority of developing countries remain removed from the process. Till the nineties the process of globalisation of the Indian economy was constrained by the barriers to trade and investment liberalisation of trade, investment and financial flows initiated in the nineties has progressively lowered the barriers to competition and hastened the pace of globalisation

IMPACT OF GLOBALIZATION

Globalization will have its impact on rural India also. It will be slow. It will have its impact on target groups like farmers, youth and women. Farmers, today 'keep in touch' with the latest information and also look up what is happening globally. Price movements and products' availability in the international market place seem to drive their local business strategies. On youth its impact is on knowledge and information and while on women it still depends on the socio-economic aspect. The marketers who understand the rural consumer and fine tune their strategy are sure to reap benefits in the coming years. The leadership in any product or service is linked to leadership in the rural India except for few lifestyle-based products, which depend on urban India mainly. There has been a substantial increase in the penetration of consumer durables in the Indian rural sector. One thirds of the premium luxury goods are now sold in the rural market. Two thirds of the middle-income households are now in the rural market. A study which compared the rural income and buying power established that if the rural income in India goes up by 1%, there would be a corresponding increase of about Rs. 10,000 crores in the buying power. On the other hand, the urban sector has showed saturation in the recent years. The fact remains that the rural market in India has great potential, which is just waiting to be tapped.

The impact of globalization will be felt in rural India as much as in urban. But it will be slow. It will have its impact on target groups like farmers, youth and women. Many of the leading companies are driving their Ad Campaigns strictly focusing on the rural consumer. Hindustan Lever is not alone in recognizing the vast potential for profits in rural India. As urban markets become saturated, more businesses are retooling their marketing strategies, and in many cases their products, to target rural consumers with tiny incomes but rising aspirations fueled by the media and other forces, according to experts.

GOVERNMENTAL ROLE

The Government Exercise in the Last Few Decades

The Government of India has designed and implemented several issue based programmes aimed at rural development. The developmental activities under the Ministry of Rural Development cover infrastructure development and reforms in the agricultural sector, the non-farm sector and the social sector. Within these sectors, issues related to production, productivity, skills, access to institutional credit, marketing of produce or services, education, health, social restructuring, empowerment of women and other socially deprived section, etc. have been the areas of focus for the policies.

Changing Rural Infrastructure

Under the Pradhan Mantri Gramodaya Yojana (Prime Minister's Village Development Programme) (PGDY), announced in the 2001-02 budget, a fund of Rs 5,000 crore was earmarked for infrastructural development in village, primarily village roads for which 50 per cent of the fund was reserved. The remainder was planned for rural housing, drinking water and sanitation. The Central Government has achieved considerable success in meeting the drinking water needs of 91 per cent of rural habitations, with an investment of more than Rs 40,000 crore on the rural drinking water supply

Road Connectivity

The Pradhan Mantri Gramin Sadak Yojna (PMGSY) is a 100 per cent Centrally-sponsored scheme launched in 2000 to provide connectivity to all unconnected habitations (around 1.60 lakh) with all-weather roads by the end of the Tenth Plan Period (2007). Expenditure has been estimated to be Rs 60,000 crore. The programme will connect 70 per cent of our villages by 2007 compared with only 40 per cent villages having road connectivity till the Ninth Five-Year Plan.

Employment Opportunities

With the objective of promoting self-employment among the educated unemployed rural youth, government programmes such as the Pradhan Mantri Rojgar Yojna (PMRY) and the Integrated Rural Development Project, were developed. These programmes, implemented at the grass-roots level under the system of Panchayati Raj Institution, aim to provide skill-based training and link access to bank credit (subsidized).

Sampoorna Grameen Rojgar Yojana

The Employment Assurance Scheme and the Jawahar Gram Samridhi Yojana (JGSY) are two schemes under the programme. The EAS is meant to create additional employment opportunities during periods of acute shortage of wage employment through manual work for the rural poor living below the poverty line. The JGSY aims at the creation of need-based rural infrastructure at the village level. Under these programmes, about 3,100 lakh man days of work were provided in 2002-03 and Rs 2,200 crore were disbursed as wages. The programmes have contributed to alleviating rural poverty.

Rural Housing

The 1991 Census revealed the presence of 1.4 crore household without shelter or residing in unserviceable kuccha house. The Central Government announced a National Housing and Habitat Policy in 1998 aiming to provide 'Housing for All' by facilitating the construction of 20 lakh additional housing units (13 lakh in rural areas and 7 lakh in urban areas) annually.

Swaranjayanti Gram Swarozgar Yojana

Swarnjayanti Gram Swarozgar Yojana (SGSY), an ongoing programme for the self-employment of the rural poor, has been in effect since 1999 after the restructuring of the erstwhile Integrated Rural Development Programme (IRDP) and allied programmes like Training of Rural Youth for Self Employment (TRYSEM) Development of Women and Children in Rural Areas (DWCRA), Supply of Toolkits in Rural Areas (SITRA) and Ganga Kalyan Yojana (GKY), besides the Million Wells Scheme (MWS). With the launching of the SGSY the earlier programmes are no longer in operation.

District Rural Development Agency

DRDA has been the principal organ over the years at the district level for overseeing the implementation of various anti-poverty programmes. The DRDA must emerge as a specialized agency capable of managing the antipoverty programmes of the Ministry, on the one hand and effectively relating these to the overall efforts of poverty eradication in the district.

Each DRDA should have the following wings:

1. Self-employment wing
2. Women's wing
3. Wage Employment wing
4. Engineering wing
5. Accounts wing
6. Monitoring and Evaluation wing
7. General Administration wing

Providing Institutional Finance in Rural India

NABARD has been the primary government institution dedicated to developing systems and delivering institutional finance in rural for both the farm sector and the non-farm sector. It refinances the loans extended by grameen banks and cooperative banks under various government schemes.

Land Reforms

Land reforms aim at redistributing ownership holding from the viewpoint of social justice and reorganizing operational holdings as a method to optimize land utilization.

The reforms measures were as follows:

- Distribute land among the landless by taking possession of surplus land from large landholders.
- Provide security to sharecroppers or tenants on tenure and ownership rights by regulating rent payable by them to landlords.
- Protect the interests of tribals in landownership against encroachment by non-tribals.
- Induce improvement in productivity through the consolidation of landholdings.
- Development of public land for the rural poor to give them access to fuelwood and fodder.

CONCLUSION

The Indian rural market has 128 million households. The rural market accounts for almost half the total market for TV sets, fans, pressure cookers, bicycles, washing soap, blades, tea, salt and toothpowder. The rural market for FMCG products is growing much faster than the urban counterpart. The market size has always been large. The size of this rural market is well over 700 million.

The price-sensitivity of a consumer in a village is something the marketers should be alive to. It is very difficult to establish a demand pattern in rural markets as the disposable income is dependent on monsoon. Globalization will have its impact on rural India also. It will be slow. It will have its impact on target groups like farmers, youth and women. The marketers who understand the rural consumer and fine tune their strategy are sure to reap benefits in the coming years. Improved irrigation facilities, infrastructure, better roads, free trading in agri produce, removal of excise duty on tractors, agri implements; and the insurance scheme for farmers announced in the Budget should all give a boost to the rural economy and generate a greater demand for corporate products. A rural India marketing strategy will not work. Corporate will have to not only think local, but also act local.

The vital role rural marketing have to play in the economic development of a developing country, is beyond doubt at present. The most glaring deficiency in rural economy is evident, is in giving the consumers a better deal in terms of services and practical training. Intensive efforts to provide these basic facilities is the need of the hour.

Indian rural marketing system should be made much more competitive by infusing competition within the country and preventing the external system equation from interfering with the local markets in the larger interests of the nation.

REFERENCES

- [1] Kripalani, M., (2002), Rural India, have a Coke. *Business Week*, 24.
- [2] Kripalani, M., (2003), Finally, Coke gets it right. *Business Week*, 47.
- [3] Luce, E., (2002), "Hard sell to a billion consumers: Marketing India: The world's second most populous country is a magnet for US brands but its market is not easy to penetrate," says Edward Luce. *Financial Times*, 14.
- [4] Merchant, K., (2003), "A salesforce for Indian villages: Marketing: Women are poised to run an online direct selling portal that promises to reach the smallest communities," *Financial times*, 9.
- [5] Moorthi, Y.S.R., (2002), "We're like this only," Retrieved October 31, 2003, from <http://learning.indiatimes.com/bm/guruspeak/moorthi.htm>.
- [6] Prahalad, C.K., & Lieberthal, K., (2003), "The end of corporate imperialism," 81, 109-117.
- [7] Srivastava, Prashant. Personal Communication, October 21 and October 31, 2003.
- [8] <www.indiastat.com>
- [9] <www.rbi.gov.in>
- [10] <www.allindiannewspapers.com>
- [11] <www.planningcommission.com>

Innovation and Creativity as a Key to Foster Sustainable Entrepreneurship: A Study in Delhi-NCR Region

Sanjeela Mathur¹ and Aditi Midha²

¹Asst. Prof., JIMS, New Delhi

²Asso. Prof., JIMS, New Delhi

Abstract—Entrepreneurship is the driving force behind bringing innovations to marketplace and opening new opportunities for growth and development. A vibrant entrepreneurial culture and community can contribute significantly to economic prosperity. In an era of rapid globalization, competition and shifting consumer demand it becomes imperative to look for fresh opportunities to not only gain market share but also to invent newer methods of resource utilization, improved quality and better productivity. In the wake of increasing significance and importance and visible impact of entrepreneurship in creating wealth and employment opportunities, building an entrepreneurial eco-system is critical to India's growth and development. The spirit of entrepreneurship has intensified in the recent years particularly with growth in knowledge - intensive services. Liberalization and globalization ushered in a new era of concerted efforts to overcome the shortcomings of the 'license raj', better accessibility of finances and above all institutional support to 'techno-preneurs' have created a conducive climate for sustainable entrepreneurship. However, generating a mass of entrepreneurs oriented to high level of growth requires more than a single factor. This paper aims to understand the role of creativity and innovation in the growth of entrepreneurship in India and also to explore various other factors that could facilitate even greater growth. The paper seeks to understand the synergized effect of three important trilogy i.e. Education, Innovation and Entrepreneurship which are mutually beneficial to each other and which are cornerstones of inclusive and sustainable growth.

Keywords: Creativity, Innovation, Start-ups, SMEs, Entrepreneurship.

INTRODUCTION

Creativity and innovation, by mere definition, means creating something new and it is central to the entrepreneurship process. Both are necessary for a successful enterprise. While creativity can be defined as "production of novel and useful idea" (Amiable et al., 1996), innovation can be defined as "transformation of a new idea into a new product or a service or an improvement in organization or process" (Heye, 2006). Millard and Kruger (2005) maintain that "creativity is clearly part and parcel of the entrepreneurial skills required to successfully start a venture. By embracing creativity and innovation, an entrepreneur's products and services can be instrumental in fostering business growth, improvement of productivity and creation of wealth and job opportunities, an enhanced image for economy and above all ultimately a better quality of life for all. It is evident that the contribution of creative entrepreneurship have drawn the attention of all and efforts to encourage innovation, technological development and entrepreneurship have made the development of high-growth ventures, global products and services and inventions possible. This innovation could be derived in various ways i.e. it could be a New Product Development, could even manifest in up gradation of the current one in terms of its utility, benefits or even 'developing a totally new concept to create an original and innovative product' (Larsen & Lewis, 2007). Nevertheless, there is a broad agreement that innovation should be present in all aspects of organizational activities and should be intrinsically the culture, mindset or a way of life for the organization. (Abraham & Knight, 2001; Kuczmarski, 1996). Ideally, innovative bearing should permeate the organization's system and constantly make efforts to deliver new products and services.

METHODOLOGY

This study is based on understanding the factors that prompted entrepreneurs to initiate the innovation process. This paper has also tried to explore the supporting factors and role of environmental inputs provided by these entrepreneurs to sustain the climate for change and continuous improvement in their organization. Entrepreneurs selected in this category were based on a criterion that they were entrepreneurs who have stated business in the last twenty years post liberalization and they are active in the development of their business. Data collection was qualitative in nature and both analytic induction method and logical analysis methods were used to interpret data and draw conclusion.

SAMPLE

The sample size included 75 entrepreneurs. Out of this, around 50% of the entrepreneurs interviewed were engaged in "knowledge -intensive" services, 30% in manufacturing sector and 20% were engaged in 'other service' sector. These entrepreneurs were in the age group of 30-55 years and were mostly located in and around the Delhi-NCR region.

OBJECTIVE

The chief objective of this research is to understand and investigate into the following areas:

- Relevance of creative entrepreneurship in encouraging business growth and economic prosperity.
- Critical examination of success factors of entrepreneurship innovation.
- Role of education, government support and environment for conducive growth of entrepreneurship

FINDINGS

Relevance of Creative Entrepreneurship

The majority of the entrepreneurs who participated in the research agreed that creativity and innovation played a crucial role in their start-ups. They all agreed that creativity in some way has been responsible for making their beginning as well as sustaining themselves in the competitive scenario. These innovations ranged from either introducing new products into the market which were based on finding alternative method of production or utilizing efficient source of energy. Few entrepreneurs were also of the opinion that innovative products and services gave them the first mover advantage and a competitive edge. Most of the entrepreneurs, while, considered creativity and innovation as important for initial survival, also felt that subsequent flow of ideas for new products and services, creative solutions to existing problems also fuelled the innovative process and added value to the business proposition. Another respondent claimed that an innovative product and service helped them to 'penetrate the market' because the differential offered to the market gained customer acceptance.. A creative approach to meeting customer expectations and tapping market opportunity encouraged innovation in most of the cases. On the basis of above mentioned observations and data collected, it can be concluded that:

- Innovation is a process by which varying degree of value enhancement is achieved. This breakthrough may be sporadic or incremental and it may be achieved through either introducing new products or services, implementing new or improved process or technological turnarounds or introducing new or improved organizational or managerial process.
- Innovation acts as a catalyst to entrepreneurship by providing ideas that can be converted into wealth by revealing and tapping market opportunities which are instrumental in developing and making a business venture flourish.
- Innovations, as understood by the survey, were not limited to high-end technology alone. Most entrepreneurs agreed that any new idea that has a potential to generate a commercial value is by itself provides a spur to an entrepreneur to start a new venture.
- Innovation, however, as most of them believed, alone does not guarantee success unless someone finds ways to convert it into a commercial proposition and this is where entrepreneurship comes in.

SUCCESS FACTORS FOR ENTREPRENEURIAL INNOVATION

Successful entrepreneurial 'Ecosystem' is a result of a number of factors in tandem. Entrepreneurs interviewed accredited a host of factors like **Motivation, Socio-cultural factors, Access to Early Stage Finance, Education and Business Environment** as 'Entrepreneurial Triggers'.

Motivation

Entrepreneurs attributed their motivational elements to attempt new ideas or implement the improvisations on the existing ones to certain factors like: Sense of Independence: Market Opportunity: New Idea: Family Background and: Challenge. Challenge was attributed by around 55% as the key driver to attempt something new while 15% felt that Sense of Independence and to be not doing the 'routine jobs' provided the impetus. 25 % were encouraged by the market opportunity and 5% believed that family background has been a supporting factor in their starting a venture.

Variation of Motivational Factors According to Age

For entrepreneurs below the age of 35, which was 40% of the total respondents, " idea driven "venture was considered highly motivating, where as entrepreneurs above that age group were more inclined towards seeking independence from routine work. Moreover, respondents in the age group of above 35 felt that Market opportunity or reaching a market with innovative products appealed significantly to the entrepreneurs.

Variations According to Family Background

The survey threw light on a significant fact that today, more and more young entrepreneurs do not necessarily have a family background of business. Despite so, these entrepreneurs have the urge to start a venture based on their understanding of their environment and utilizing their skills to tap opportunities and market potential. The study revealed that 30% of the respondents were First Generation Entrepreneurs, 45 % respondents were Second Generation

Entrepreneurs who, although belonged to the business background, did not start their business in the same sector. They too were 'Idea Driven' and wanted to experiment with their innovation. 25% respondents, however, were also Second Generation Entrepreneurs who were in the same business but definitely wanted to improve the existing business processes or even the change the "way of doing things".

Variations According to Work Experience

Level of work experience significantly influenced the motivational factor of the entrepreneurs:

Out of the total respondents, 40 % belonged to the category of work experience between 5-10 years. 30 % had an experience of more than 10 years, while 20 % had an experience of less than 5 years and 10 % had no work experience at all. It was observed that Family Background became less important with increasing level of work experience. On the other hand, those respondents with higher levels of experience did not consider family background as an important issue and Market Opportunity and Challenge became major 'Entrepreneurial Triggers'. Independence was not motivation for those who had lower level of experience while experienced respondents rated this factor extremely high. The study also found that there was a strong correlation between Work Experience and Idea Generation. Most of them attributed their venture to the sector and domain of their working over the years, from where they generated the idea and innovation. While working as employees they were either able to identify the gaps or the emerging opportunities which was considered with enough potential to design new products and services.

Variations According to the Time Period of Business

Time-period of the venture establishment seems to have a significant influence on the motivational factors. 20 % Entrepreneurs who belonged to the pre- liberalization era i.e. before 1991 felt that Independence was a major criterion for motivation as the absence of opportunities to experiment and lack of incentives by the government did not encourage entrepreneurial innovation. Family background has also been attributed as one of the factors for entrepreneurship in the pre-1991 phase. Post-liberalization, Market-opportunities, Idea-driven and opening of various sectors to privatization were attributed as motivation triggers. Thus, it could be concluded from the above observations that:

- Entrepreneurship is an emerging trend. There is a growing consciousness towards innovation amongst the newer generation and while this new generation is ambitious yet turnover or making money on the quick is not the only motivating factor. Infact, quality of work and nature of enterprise has been given commendable importance idea.

SOCIO-CULTURAL FACTORS

Socio-Cultural factors are a set of social norms, values, family values, social networks and social status of entrepreneurship that plays an important role in nurturing an entrepreneurial ecosystem. The study explores the family and social support system of the respondents across various parameters:

VARIATIONS ACCORDING TO FAMILY BACKGROUND

The study revealed that the family support to the first-generation entrepreneurs was definitely low as the risk proportion was higher in their case; hence there were shades of scientism, neutrality and sometimes a non-supportive family. 70 % of the second generation entrepreneurs who had entered the same family business had a better support from their inner circle and family members than the second generation entrepreneurs who had started new ventures, for whom the uncertainty and risk was higher. This often resulted in reduced level of support.

VARIATIONS ACCORDING TO WORK EXPERIENCE

Work Experience plays a greater role in support of the family and social community. Entrepreneurs who had started their ventures after more than 10 years of work experience, had greater support at the time of starting compared to those who had started afresh or those who started their ventures with less than 10 years of experience. Work experience, according to the study, provided the entrepreneurs with the required security blanket of expertise, financial security and social capital to become successful entrepreneurs.

ACCESS TO EARLY STAGE FINANCE

Availability of finance in the start- Entrepreneurs, who started on their own funds had borrowed from family, friends and even used their savings from their jobs. They also belonged to the category where they used the money from their existing family business to start their ventures. 25 % of the respondents, who started their ventures on their own, had borrowings from friends, family, 35 % used their current business to finance their new ideas and 40 % had savings from their jobs which was used to start their innovative ventures. The findings throw an important light on the growing confidence amongst the entrepreneurs today in their ideas and potential of success. At the same time, it is a positive indication of growing support by family, friends and the social support system to encourage innovative ideas.

SELF-FINANCE

The study revealed that around 60% of the respondents were self-financed at the start-up phase, 20% had approached banks for loans and, 15 % had sought funds from financial corporations and only 5% accounted for funds from venture capitalists. Out of the 20% who had approached the banks, 60 % had actually got approved loans.

BANK-FINANCE

The study also revealed that bank finance was found to be more appropriate by entrepreneurs at the growth stage of business. Most of them rated "difficult" to early stage bank finance. 45% rated Early Stage finance as difficult to be obtained due to absence of securities and probable uncertainty of their ideas. 35% rated it 'Average' when it came to be sanctioned bank loans at the early stage but also pointed out that availing loans for the growth phase is easier as the credibility of the idea has been established to some extent. 20% considered obtaining bank finance to be extremely difficult and attributed it to procedural compulsions, time consuming and not supportive of innovative ventures.

VENTURE CAPITALIST

A small percentage of respondents were able to finance their ventures through venture capitalists. 40% of the entrepreneurs found the approach of the VCs 'Satisfactory' 32% attributed it as 'Unsatisfactory' while 28% found the VCs as 'Completely Indifferent' to their venture 'Idea'.

Since Venture Capitalists and Private Equity funds are more visible in knowledge – intensive sectors, a more unique model of debt-equity financing could spur the growth of entrepreneurship in India.

ROLE OF EDUCATION AND ENVIRONMENT

Education

Education is considered indispensable for skill development and fundamental to innovation. It acts as a catalyst to generate new ideas and to be able to create commercially viable innovation of new products is a result of environment of experimentation and continuous value addition.

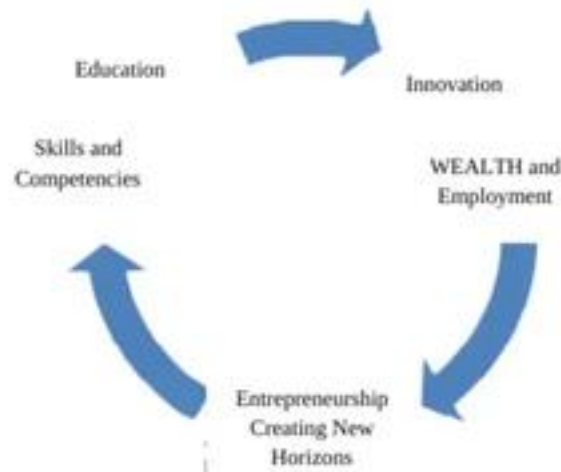


Fig. 1: Classification by Sectors

Source: National Knowledge Commission Report, 2007

Variation According to Age

The study revealed that most entrepreneurs above the age of 45 considered education as very important factor for success. 95 % of the respondents were minimum undergraduates. 75% of these felt that to a great extent education has been instrumental in making them consider entrepreneurship. Nearly 75% of the educated entrepreneurs had a Science and an Engineering degree. They claimed that while technical education was responsible for their innovative ideas yet not the only factor. Entrepreneurs below 45 were also minimum graduates but at the same time 55 % of the total was also holding post graduate degrees in Management as well as Liberal Arts.

Variation According to Time Period

The study also found that 70% entrepreneurs in the time period of 2000- 2008 were mostly people with added qualifications (MBA) as compared to respondents in the pre-2000 phase. This indicates a rising trend of preference for higher education amongst the new entrepreneurs.

AVAILABILITY OF SKILLED EMPLOYEES'

The availability of skilled employees was considered as a major constraint and a limiting factor. The issues faced related to both recruitment as well as retaining skilled workers. 45 % of the respondents said that the problem was 'Extremely Acute', 25% considered it as 'Difficult', 20 % 'Average' and only 10 % found it 'Easy'.

RETENTION OF EMPLOYEES'

Entrepreneurs who had enterprises for more than 4-5 years old did not face considerable problem in retaining employees as they had a better credibility and retaining policies. However, younger ventures found difficult to both attract and retain talent due to relatively lack of brand value.

Thus, on the basis of above study, it may be concluded that:

- Entrepreneurship requires skilled workers in large number and this must be sustainable as new opportunities generated by economic development have to be continuously converted into wealth..
- High-Tech innovations are possible if conducive education and flexible environment is provided to enable creativity and 'Entrepreneurial Socializations' to take place.
- Incubation centers and institutions providing skill enhancement and development would go a long way in solving the shortage of skill in the country as well as generating employment in the nation.

ENVIRONMENT

An important requirement for nurturing entrepreneurship is the creation of a conducive environment to promote business. Important parameters of a conducive environment include–Ease of starting a business in terms of Obtaining Clearances, Permits, Licenses etc, Strong and Supportive Legal System, Absence of Corruption and finally the most important prerequisite i.e. a world class Infrastructure System.

The study revealed that the entrepreneurs faced some problems which proved to be critical bottlenecks in the success of their ventures. Around 55% of the respondents attributed absence of suitable infrastructure as a serious limiting factor, followed by high taxation which was 35% and further an inefficient legal system was given by 10 %.Corruption was also rated high by the respondents..

LACK OF INFRASTRUCTURE SUPPORT

Infrastructural support system in terms of transportation, electricity, power and telecommunication has been stressed by entrepreneurs as either not available or 'simply inefficient'.

Absence of relevant information regarding starting a venture such as regulatory issues, statutory compliances, registration processes and available sources of finance do not encourage entrepreneurial growth. This factor had variation in time-period. While 65% of the respondents who had started their ventures before 1991 rated this factor as 'Extremely Poor', those after 2000, rated it as 'Average'.

Difficulty in Start-Up Operations has been another limiting factor for Indian entrepreneurs. According to a World Bank report 'Doing Business in South Asia 2007', it says that it takes 35 days (Mumbai) to 52 days (New Delhi) to start a business in India. Most of the entrepreneurs cited multiple registrations, complex procedures, dual taxation policies, obtaining permits and clearances both at the state and central level as a major impediment. Although Single Window schemes have been introduced, yet entrepreneurs in the post 1991 phase feel that it is still not satisfactory as power to give approvals is still vested in various departments and authorities under various statutes and notifications.

Corruption is a word which most respondents in their entrepreneurial journey have faced. Bureaucratic delays, providing clearances and permits, not responding to registration requirements remain some of the stronghold of corruption.

Taxation, also, was stated as a problem area for most entrepreneurs. Cumbersome tax procedures as well as multiplicity of taxation created a lot of confusion and resource draining for most entrepreneurs. Collection of taxes through multiple government agencies also increased the problem of complying with tax regulation. 30% of the entrepreneurs said that they faced problems due to Multiplicity of taxes, 45% faced problem due to Complexity of Procedures and 25 % said that it was both. In other words, problems regarding taxation were faced by entrepreneurs in some form or the other.

Hence, while India remains at an advantage of human resource, skill, demographic profile, growing domestic demand and a rising middle class which can prove to be drivers of change, but at the same it is important to understand that unless some of the problems faced by entrepreneurs in their start-up phase is suitably addressed, the dream of making India a strong economic power would remain unfulfilled. Although many efforts have been done by the government in the form of Single Window Scheme, PPP's in Infrastructural development, Single Composite Application Forms etc, it is still a long way to achieve satisfaction. The challenge is to make policies into catalysts for driving entrepreneurship in India.

CONCLUSION

Thus, success in business today requires constant innovation. Sensitivity to arising problems and generating solutions would in itself leverage new products or services for a changing market. In the dynamic environment today, success comes from looking for fresh opportunities and having the ability to find hidden connections and insights into innovations desired by the customer. Entrepreneurs, today, will have to be highly creative and their start-ups innovative. They have to foster a conducive climate for generating creativity, provide a top-down support for innovation and offer new products and services through new methods of production and delivery. Entrepreneurs today need to invest in people and build teams for inclusive growth.

At the same time, it is equally imperative that the government, financial agencies, educational institutions have to play a constructive role in building the entrepreneurial climate in the country. They have to encourage a conducive environment building by ensuring a simplified start-up process, easy accessibility to information, improve delivery time, raise corporate governance standards norms, encourage a climate of risk taking and spur more and more seed funding and corporate financing to meet the need for funding at start-up stage.

Hence, a better management of resources coupled with the environmental support can prove to be the answer to the economic perils of the nation.

Annexure: List of Tables: Classification of Entrepreneurs:

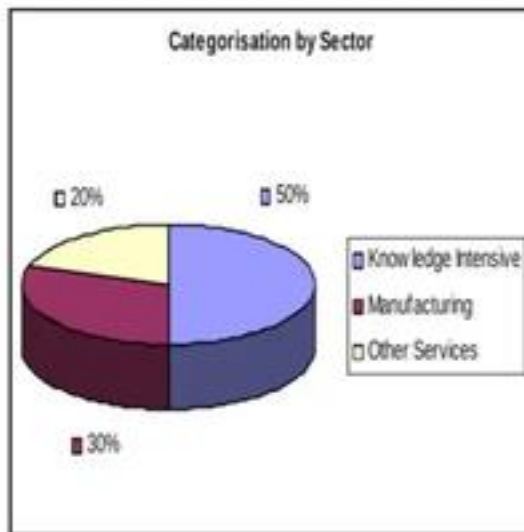


Fig. 2: Classification According to Age

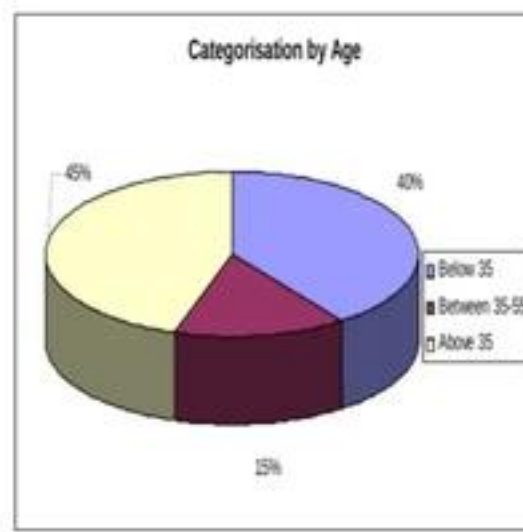


Fig. 3: Classification According to Education

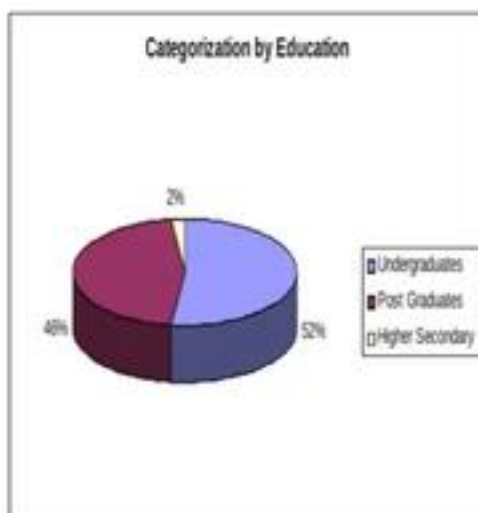


Fig. 4: Classification by Time Period

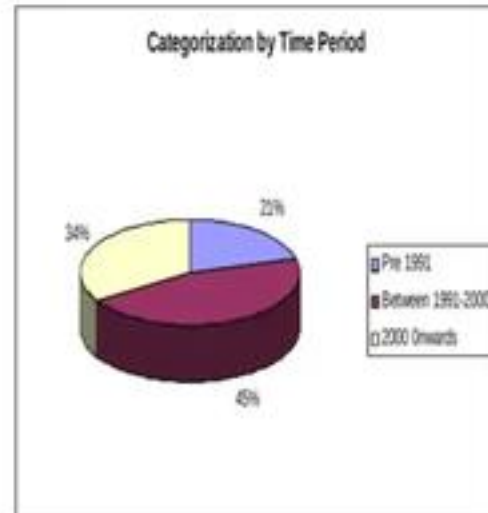


Fig. 5: Motivational Factors for Entrepreneurship

Doing Business in India: International Perspectives (With Particular Reference to Business Process Outsourcing (BPO) Industry)

James Ondracek¹, Andy Bertsch², M. Saeed³ and Matthew Cohen⁴

^{1,2,3}Professor, ⁴Associate Professor, ⁴Professor & Research Associate, Minot State University, North Dakota, USA

Abstract—The country of India is one of the fastest growing economies in the world. With beneficial business incentives and a wealth of highly qualified, highly motivated potential employees, India is becoming a hub for economic growth and technological advancement. With so much expansion in India many industries, specifically the contact center and Business Process Outsourcing (BPO) industry, have entered into the global market with vigorous development. Currently India is ranked number one in the world in both the call center and BPO industries, has been able to grow the BPO and IT export sector to more than \$47 billion USD, and has captured half of the entire world's offshore service business. This study provides an overview of business climate, glimpses of socio-cultural, economic, and technological environments, with particular reference to insights pertaining to business process outsourcing industry. This article is recommended reading for those interested in doing business in India including students of international business.

Keywords: Business Process Outsourcing, Competitiveness, Call Center Industry, Business Climate, Incentives, Information Technology Trends, Genpact, TCS, Wipro, Aegis, WNS Global Services

AN OVERVIEW OF BUSINESS CLIMATE

The business climate in India is very favorable in terms of American investments and expansion. First, the business language is English, the language spoken by Indian knowledge workers. However, there are also many other local languages spoken throughout the country that cause some difficulty in communications. Second, the population of India is about 1.16 billion people, many of which are highly educated, so there would be no problem to meet the labor demands of the business. Third, the government in India has been relaxing bureaucratic rules, aiding in growth in the country. Finally, wages in India are at a competitive level from global standards. This would aid in cost cutting for the business for the salaries of its employees. Before we begin the analysis of the climate for doing business in India, a quick introduction to India's economic background is essential to gain an emphatic knowledge of why foreign investment would thrive in such an emerging economy like India. For four decades since independence in 1947, India embarked on a protectionist, state-controlled industrial model. While this created a diverse industrial and technological infrastructure, it also caused some lacunae in the development and international competitiveness of India (Kohli 1996, p. vii). Restrictions were imposed on foreign investment and Indian corporate entities had limited interaction with their counterparts in other countries.

In 1991, India was faced with a precarious economic situation: GNP in the previous year had grown by only 1% and foreign exchange reserves had declined to dangerously low levels, at one point being equivalent to only three weeks of imports (Tan, Low, Williams, & Zutshi 1996, p. 3). For the first time in modern history, India was faced with the prospect of defaulting on external commitments. In June 1991 the Government of India had to initiate negotiations with multilateral agencies for long-term loans, utilize facilities from the IMF and seek emergency bilateral assistance from countries like Japan and Germany (Bajpai 2002, p. 2). In exchange, the Government had to commit to structural adjustments, paving the way for economic reforms. These initiatives encouraged foreign investment, allowing up to 100% majority foreign equity.

India is a preferred destination for domestic and foreign investments whether you are moved by resource seeking or market seeking motives, or whether you are pursuing cost leadership or differentiation strategy. India has strengths in information technology and other significant areas such as auto components, chemicals, apparels, pharmaceuticals, and jewelry. India has a large pool of skilled managerial and technical expertise, a vibrant democracy, and a huge English-speaking population. Industrial policy reforms have substantially reduced industrial licensing requirements, eased restrictions on expansion and facilitated easy access to foreign technology and Foreign Direct Investment (FDI). Positive economic reforms, since 1991, aimed at deregulating the economy and stimulating foreign investment, have caused India to grow rapidly at an average GDP growth rate of over 8% annually in the past five years. The key aspects of the Indian economy in this regard include:

- 100% FDI is allowed under the automatic route in most of the sectors/ economies
- Free repatriation of profits and capital investments.
- India has Double Taxation Avoidance Agreement (DTAA) with several countries.

India has a good investment platform which actively encourages the entrance of foreign players into the market, either through Foreign Direct Investment (FDI) or through Foreign Institutional Investments (FII). During the 1990s the FDI regime has been liberalized with several restrictions on foreign investment being removed. Presently FDI can be divided into two broad categories – FDI under automatic approval route and FDI with prior approval of the government. There is also a list of industry into which FDI is prohibited. In 2008, despite the slowdown of the global economy, India



Fig. 6: Classification by Work Experience

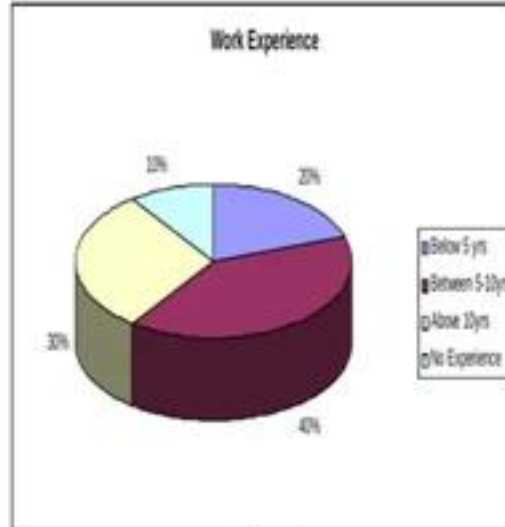


Fig. 7

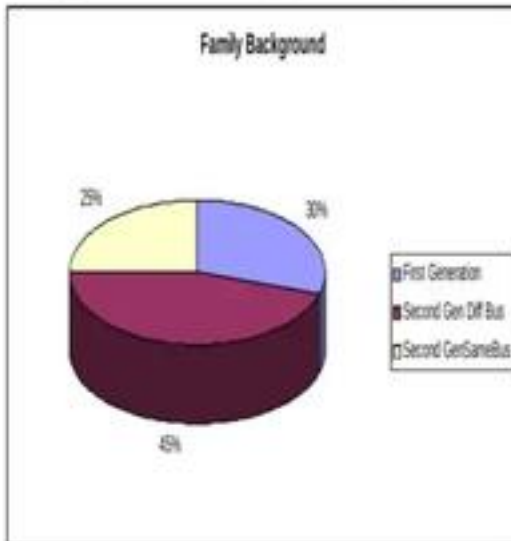


Fig. 8: Financing Options

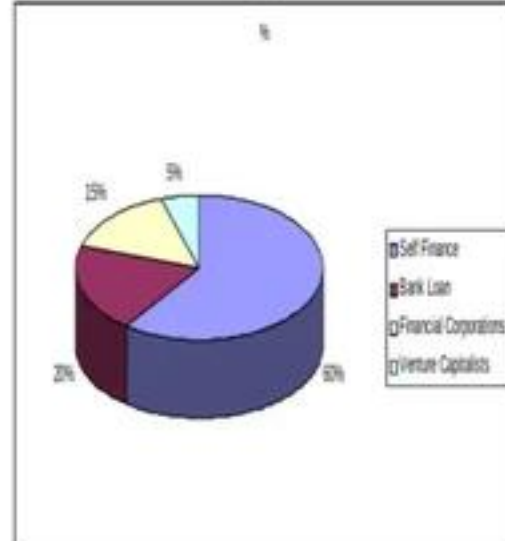


Fig. 9: Overall Break-up of Problems in Percentage

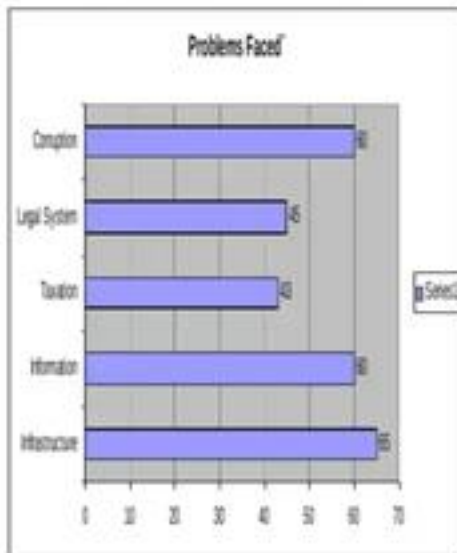


Fig. 10

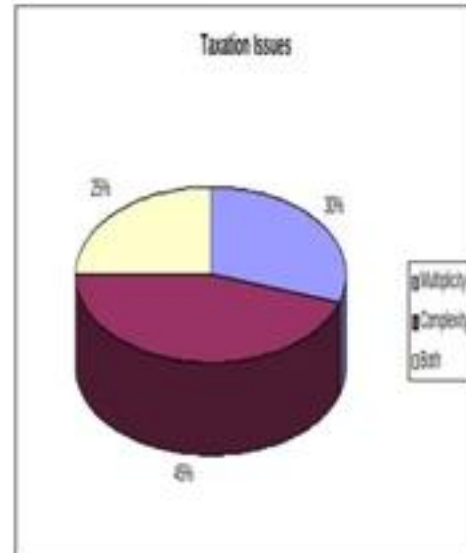


Fig. 11

REFERENCES

- [1] Abraham, J., & Knight, D., (2001), "Strategic innovation: Leveraging creative action for more profitable growth," *Strategy and Leadership*, 29(1), 21–26.
- [2] Amabile, T.M., Conti, R., Coon, H., Lazenby, J., Heron, M., (1996), "Assessing the work environment for creativity," *The Academy of Management Journal*, 39(5), 1154–1184.
- [3] Barringer, B.R., & Ireland, R.D., (2006), *Entrepreneurship: Successfully launching new ventures*. New Jersey:
- [4] Chakravorti B., (2004), "The New Rules for Bringing Innovations to Markets," *Harvard Business Review*, March.
- [5] Davidsson, P., (2004), *Researching entrepreneurship*. New York: Springer.
- [6] Drucker P. F., (2002), *Management Challenges for the 21st Century*. London: Butterworth Heinemann.
- [7] Gilmore, A., Carson, D., & o' Donnell, A. (2004). Small business owner-managers and their attitude to risk. *Marketing Intelligence and Planning*, 22(3), 349–360.
- [8] *Harvard Business Essentials* (2003). Managing creativity and innovation. Boston:
- [9] Heye, D., (2006), "Creativity and innovation: Two key characteristics of the 21st century information professional," *Business information Review*, 23(4), pp. 252–257.
- [10] Kuczmarski, T., (1996), "What is innovation? The art of welcoming risk," *Journal of Consumer Marketing*, 13(5), 7–11.
- [11] Larsen, P., & Lewis, A., (2007), "How award winning SMEs manage the barriers to innovation," *Creativity and Innovation Management*, 16(2), 142–151.
- [12] Loewe, P., & Dominiquini, J., (2006), "Overcoming the barriers to effective innovation," *Strategy and Leadership*, 34(1), 24–31.
- [13] Pretorius, M., Millard, S.M., & Kuger, M. E., (2005), "Creativity, innovation and implementation: Management experience, venture size, lifecycle stage, race and gender as moderators," *South African Journal of Business Management*, 36(4), 55–68.

Role of MSMEs (Micro Small & Medium Enterprises) in the Growth of Indian Economy

Jyoti Sharma

Lecturer, Shri Venkateshwara University, Gajraula

Abstract—In both developed and developing countries, the government is turning to small and medium scale industries and entrepreneurs, as a means of economic development and a veritable means of solving problems. It is a seedbed of innovations, inventions and employment. Presently in India, MSMEs assist in promoting the growth of the country's economy, hence all the levels of government at different times have policies which promote the growth and sustenance of MSMEs. This paper identifies the orientation of MSME's and entrepreneurial trends in India, tackles the operational definition and scopes, and describes the role of the Indian government as a participant, regulator and facilitator, both legally and politically in the growth of MSMEs and entrepreneurship. It identifies the main problems of MSMEs and entrepreneurs in India, the provision and enactment of beneficial and supportive laws, the provision of infrastructural facilities, constant man-power and development, direct financial assistance to MSMEs and the establishment of finance institutions to support MSMEs.

Keywords: Entrepreneurship, Economic growth

INTRODUCTION

Worldwide, the micro small and medium enterprises (MSMEs) have been accepted as the engine of economic growth and for promoting equitable development. The major advantage of the sector is its employment potential at low capital cost. The labour intensity of the MSME sector is much higher than that of the large enterprises. The MSMEs constitute over 90% of total enterprises in most of the economies and are credited with generating the highest rates of employment growth and account for a major share of industrial production and exports. In India too, the MSMEs play a pivotal role in the overall industrial economy of the country.

Prior to the Economic Reforms of 1991, the focus of SSI development policies was mainly on protection (reservation of items for exclusive production by SSIs, for example) and concessional incentives (such as tax rebates and subsidies). With liberalization and the opening up of the markets in 1991, this focus shifted to strengthening the competitive edge and capacity-building through facilitation and infrastructure. Major emphasis was placed on quality certification, technology upgrading, and market exposure.

According to the MSMED Act of 2006, based on investment limits, the different types of enterprises are defined as shown in Table:

Table 1: Definition of Enterprise Types

Type of Enterprise	Investment Limit (INR Million)	
	Manufacturing	Service
Micro	Up to 2.50	Up to 1.00
Small	> 2.50 but < 50.00	> 1.00 but < 20.00
Medium	> 50.00 but < 100.00	> 20.00 but < 50.00

SMEs have been established in almost all-major sectors in the Indian industry such as:

- Food Processing
- Agricultural Inputs
- Chemicals & Pharmaceuticals
- Engineering; Electricals; Electronics
- Electro-medical equipment
- Textiles and Garments etc.

INDIAN SMES LOOK OFFSHORE FOR GROWTH

As per available statistics (4th Census of MSME Sector), this sector employs an estimated 59.7 million persons spread over 26.1 million enterprises. This sector accounts for 90% of industrial enterprises, 45% of total industrial output, 40% of exports, and 7.8% of GDP, with a manufacturing range of 7,500 products.

Underpinned by an increasingly positive outlook on the economy, Indian SMEs plan to increase capital expenditure and hire more staff in the next six months and a growing number are eyeing an offshore expansion for their business. The latest HSBC research states that confidence among Indian SMEs surged in the fourth quarter of 2010, increasing more than any other SMEs in Asian market. The research findings show the number of SMEs across India conducting

international business activities is expected to rise from 31 per cent to 56 per cent by 2013. The increase is driven by domestic SMEs, 24 per cent of which plan to become international by 2013, revealed the bi-annual research. The HSBC Small Business Confidence Monitor gauges the six-month outlook of SMEs on local economic growth, capital investment plans and recruitment drives. Dheeraj Dikshit, head of SME Business, HSBC India said, "We are seeing an increasing number of small to medium businesses who are looking to expand their business offshore and this is borne out in the results of this research. At the same time, economic conditions, particularly in the emerging markets, have returned to pre-crisis levels so the booming confidence that we are seeing is not surprising."

Further, the research showed positive outlook on local economic growth, which is expected to maintain the same pace in the next six months, while a larger portion of the respondents in the survey expect the pace to increase. On the capital expenditure, the outlook remained largely seemed to be stable, however a smaller portion of the respondents were planning to increase their capital expenditures, while one per cent were planning reductions.

Meanwhile, forty per cent of Indian SMEs surveyed they would increase staff in the next six months, up from 22 per cent in 2Q 2010, and 60 per cent plan to maintain staff levels, while none of those surveyed have plans to reduce staff.

CHALLENGES FOR SMES

In most of the developing countries as well as in APO member countries, an overwhelming majority of enterprises (over 90%) are SMEs. All over the globe SMEs face problems of access to domestic and international markets, obsolete technology, unskilled human resources, lack of finance, unavailability of appropriate and timely business information and use of information technology, poor product quality and standardization, environmentally unfriendly production processes, and lack of management systems and entrepreneurial capabilities. The degree of intensity of these problems varies according to the size of the firms, with obviously higher intensity for very small firms. Some problems of SMEs are as follows:

Conspicuous Absence of Entrepreneurial Mindset

While central and state governments are working to diagnose and meet the requirements of small entrepreneurs, the mindset of typical Indian youth still focuses on going into "service" after finishing their "education." Most business schools and academic institutions are working on the prospects of placing students in highly remunerative jobs instead of creating entrepreneurs—a residual trait from the old colonial system. The typical MBA graduate takes pride in getting placed in a multinational corporation or government agency rather than in setting up a small enterprise and "being his own boss."

Lack of Business Thinking and Ethical Base

When entrepreneurs set up their own businesses they often lack the acumen to sustain them and the willingness to sacrifice in the present for the sake of the future. They also lack the ethical foundation to resist the temptation to "get rich quick."

INFRASTRUCTURAL AND OTHER CHALLENGES

Challenges exist in most locations in the context of physical infrastructure (storage facilities, road, power, water, etc.) and also possible common facilities (testing, effluent treatment, technologically advanced facilities to meet gaps along the supply chain, etc.). The government is now encouraging establishment of these facilities through public-private partnerships. While government institutions and agencies are working hard in the areas of setting up, financing, standardizing quality, product launching etc., SSI growth still is inhibited by some of the following factors.

Entry Barriers: Apart from self-imposed restrictions, setting up new businesses is still difficult because of several types of social inhibitions:

- Women are not being adequately encouraged.
- Entrepreneurship is not being viewed as a career option in "traditionally non-business" communities.
- It is often a negative push (inability to secure other reasonable means of livelihood) rather than a positive pull that leads to an entrepreneurial career.
- The entrepreneurship idea has yet to spread to tribal and interior villages.

Government Policies & Incentives For Smes

The Ministry of Micro, Small and Medium Enterprises is the nodal Ministry for formulation of policies, programmes and schemes, their implementation and related co-ordination, for the promotion and development of small scale industries in India. The role of the Ministry is to assist the States in their efforts for the growth of the small scale sector, by enhancing their competitiveness in an increasingly liberalised economy. It is assisted by an attached office and two public sector enterprise, namely:

- Micro, Small and Medium Enterprises Development Organisation (MSME-DO) - the Office of the Development Commissioner (Micro, Small and Medium Enterprises) [earlier known as the O/o the DC (SSI)] is also known as Micro, Small and Medium Enterprises-Development Organisation (MSME-DO). It is the apex body for assisting the Government in formulating, coordinating, implementing and monitoring policies and programmes for micro, small and medium enterprises (MSMEs) in the country.
- National Small Industries Corporation Ltd (NSIC) - was established by the Government with a view to promoting, aiding and fostering the growth of micro, small and medium enterprises in the country, with a focus on commercial aspect of their operations. It implements several schemes to help the MSMEs in the areas of raw material procurement, product marketing, credit rating, acquisition of technologies, adoption of improved management practices, etc.
- Khadi and Village Industries Commission (KVIC)-established under the Khadi and Village Industries Commission Act, 1956, as a statutory organisation engaged in promotion and development of khadi and village industries for providing employment opportunities in the rural areas.
- Coir Board - is a statutory body, established under the Coir Industry Act, 1953, for the promotion and development of coir industry in India as well as for uplifting the living conditions of the workers engaged in this industry.
- Also, a National Commission on Enterprises in the Unorganised Sector (NCEUS) has been set up for addressing the wide range of issues affecting the productive potential of the unorganised micro and small productive units.
- Besides, there are three national level 'Entrepreneurship Development Institutes (EDIs)' for the development of training modules, undertaking research and providing consultancy services for entrepreneurship development in the small scale sector. These include:-
- National Institute of Small Industry Extension Training (NISIET) renamed as the National Institute for Micro, small and Medium Enterprises (NIMSME) at Hyderabad
- National Institute of Entrepreneurship and Small Business Development (NIESBUD) at Noida
- Indian Institute of Entrepreneurship (IIE) at Guwahati.

In order to protect, support and promote small enterprises as also to help them become self-supporting, a number of protective and promotional policy measures have been undertaken by the Government. The promotional measures cover:- (i) industrial extension services; (ii) institutional support in respect of credit facilities; (iii) provision of training facilities; (iv) supply of machinery on hire-purchase terms; (v) assistance for domestic marketing as well as exports; (vi) technical consultancy and financial assistance for technological upgradation; etc.

The Reservation Policy is the most important policy of the Government for the sector. It has the twin objectives of ensuring increased production of consumer goods in the small scale sector; and expanding employment opportunities through setting up of small scale industries. Reservation of items for exclusive manufacture in SSI sector is statutorily provided for in the Industries (Development and Regulation) Act, 1951. The overwhelming consideration for reservation of an item is its suitability and feasibility for being made in the small scale sector without compromising the quality aspect. At present, the total number of items reserved for exclusive manufacture in the micro and small scale sector are 35.

Recognising the role of credit for the small scale sector, a focused Credit Policy has been in place since the early days. Priority sector lending is its most important component. Under it, banks are compulsorily required to ensure that defined percentage of their overall lending is made to the priority sectors, which includes small industries. As a part of the institutional arrangement, Small Industries Development Bank of India (SIDBI) has been set up as the apex refinance bank. Term loans are provided by State Financial Corporations (SFCs) and Scheduled Banks.

GENERAL RECOMMENDATIONS

- Special efforts are needed to increase the level of awareness about Government schemes /programs for benefit of SMEs.
- Innovation and Entrepreneurship hold the key to enhancing the role of SMEs in improving the Indian economy. As their importance is not well realized, countrywide programmes on entrepreneurship and innovation must be launched in the shape of a national movement. Entrepreneurship should be promoted as a preferred career and not as an alternate career.
- Industrial Training Institutes should be encouraged to organize short-term programs for vocational training of school dropouts in a variety of multi-skilled job positions that would be available in SMEs.
- Specially, Polytechnic and ITI students should be encouraged to build their careers in SMEs. There are many jobs for these students in SMEs.
- There are some entry barriers for women in India. Self Help Groups (SHGs) of Women, their federations (for example, Confederation of NGOs of Rural India -CNRI) should be encouraged properly.

CONCLUSION

The Small and Medium Enterprises (SMEs) have been globally recognized as a priority sector for growth and development and India is not an exception to this generality. In spite of facing various problems, SMEs accounts for 90% of industrial enterprises, 45% of total industrial output, 40% of exports, and 7.8% of GDP. Protecting fragmented and disorganized SMEs interest in the context of highly concentrated market structures is a formidable challenge. However, a coherent policy and concerted actions on suggested measures by the policy makers, trade associations, the CCI and fans of free and fair competition in markets in India can make significant contribution in strengthening the SMEs. The Government is committed to promote the growth of SMEs and to enhance their competitiveness. At the same time, however, SMEs need to adapt, revitalize, and reposition themselves in order to seize the opportunities coming to them in the new world order. SMEs need to expand their vision to internationalize their businesses.

REFERENCES

- [1] Asian Productivity Organization, Tokyo, 2007, Report of the APO Survey on "Entrepreneur Development for Competitive SMEs" (05-RP-GE-SUV-41-B)
- [2] Mathur, Reeta (2003), Recent Trends in Indian Economics, Jaipur : Sublime Publication
- [3] The Hindu Survey of Indian Industries, 2008.
- [4] PASCHEEM - A newsletter of the CII Western region September- October 2007 "SME sector in India - A brief profile"
- [5] Deloitte Research Report "Growth Opportunity for Indian SMEs"- April 22, 2008
- [6] Online Monthly Economic Bulletins
- [7] <<http://msme.gov.in/>>
- [8] <<http://economictimes.indiatimes.com/>>

Consolidated FDI Policy 2011: Level Playing Field for Domestic Participants and Foreign Players

Niti Saxena

Asst. Prof., JIMS, New Delhi

Abstract – Foreign direct investment (FDI) in India has played a stellar role in the development of the Indian economy. FDI is a key driving force enabling India to achieve a certain degree of financial stability, growth and in attracting sustained foreign investment into the country. The objective of the Government is to promote FDI through a policy framework which is transparent, predictable, simple and clear and reduces regulatory burden. To simplify the rules and regulations pertaining to the foreign direct investment policy, the system of periodic consolidation and updation is introduced as an investor friendly measure. The present paper seeks to appraise the major revised policy initiatives (FDI policy 2011, circular 2) announced by the government on 31st September 2011 to encourage FDI inflows into the economy and its impact on the domestic participants and foreign players.

Keywords: FDI, Industrial Policy, Economy.

INTRODUCTION

Although the present worldwide economic environment is going through a phase of turbulence, the Indian economy has slowly and gradually emerged as a global economic power. In the post-liberalization era, the foreign direct investment (FDI) has been strategically acknowledged as the life-blood of Indian economy uplifting and accelerating the pace of economic reforms in major sectors of the country. As a normal entry mode, the FDIs in India are permitted through financial collaborations, through private equity or preferential allotments, by way of capital markets through euro issues, and in joint ventures. The Foreign direct investment scheme and strategy depends on the respective FDI norms and policies in India. Foreign investments into India are subject to the industrial policy established by the Department of Industrial Policy and Promotion (DIPP) under the Ministry of Commerce and Industry which is the apex agency. The policy framework on FDI serves as a 'ready reckoner' for the domestic as well as foreign participants on foreign investment related norms and regulations. The Department of Industrial Policy and Promotion, in line with semi-annual consolidation of the FDI policy framework, issued Circular 2 of 2011 on 30 September 2011 to notify the updated FDI policy. The new policy document introduces certain important changes in the extant FDI policy framework and integrates Press Notes/ Press Releases/ Clarifications / Circulars issued by the Department since the previously notified consolidated FDI policy. The FDI Policy issued by DIPP vide circular 1 of 2011 dated March 31, 2011 (**Circular 1 of 2011**) has been replaced by Circular 2. The revised FDI policy seeks to regulate the foreign direct investment into India in the various manufacturing and service sectors. The major question to be analyzed is whether the revised policy norms issued by Government of India will provide a level playing field for the domestic participants vis-à-vis the foreign investors.

FDI SCENARIO IN INDIA- AN OVERVIEW

**Table 1: Sectors Attracting Highest Fdi Equity Inflows (From April 2000 To March 2010)
(Amounts in Millions USD)**

Sl. No.	Sector	Amount of FDI Inflows	% As To Total FDI Inflow
1.	Service Sector(Financial & Non- Financial)	9,65,210.77	22.14
2.	Computer Software & Hardware	4,13,419.03	9.48
3.	Telecommunication	3,68,899.62	8.46
4.	Housing & Real Estate	3,25,021.36	7.46
5.	Construction Activities	2,65,492.96	6.09
6.	Automobile Industry	1,90,172.22	4.36
7.	Power	1,79,849.92	4.13
8.	Metallurgical Industries	1,25,785.57	2.89
9.	Petroleum & Natural Gas	1,11,957.00	2.57
10.	Chemical	1,01,680.18	2.33

Source: DIPP, Ministry of Commerce and Industry, Govt. of India

The foreign direct investment policy has significantly contributed in injecting the foreign capital funds into the country. The FDI statistics and data pertaining to FDI inflows coming to India during the period 2000 to 2010 is gives an indication of the emergence of India as both a potential investment market and investing country. The FDI inflow has continuously increased over the period expect during 2002-2004 where it decreased by nearly 14%. From a mere 4029 millions USD in 2000-01, the FDI has helped the Indian economy grow, and the government continues to encourage more investments of this sort. The Inflow of FDI during 2009-10 was 16232 million dollars. During 2009-2010 FDI in India showed an enormous increase mainly due to severe recession in other parts of the globe. FDI inflow in the country was USD 18.3 billion during April-February 2010-11, down 25 per cent from USD 24.6 billion in 2009-10. According to the latest data released by the Department of Industrial Policy and Promotion (DIPP), the FDI inflow rose by more than 100 per cent to US\$ 4.66 billion in May 2011, which was the highest monthly inflow of previous 39 months, while the

cumulative amount of FDI equity inflows from April 2000 to May 2011 stood at US\$ 205.96 billion. The sector-wise analysis shows that the service sectors (including financial and non-financial) attracted highest FDI equity inflows during April-May 2011-12 at US\$ 910 million.

Fdi Policy 2011-Major Amendments (As Per Circular 2)

Some key changes made to the old FDI policy vide the New FDI Policy concerning various sectors/issues and its implications are as follows:

Conversion of Imported Capital Goods/Machinery Into Equity

Conversion of imported capital goods/machinery and pre-operative/pre-incorporation expenses to equity instruments had been permitted in the last circular on FDI policy, effective 1 April, 2011. It was stipulated that such conversions must be made within a period of 180 days of the date of shipment of capital goods/machinery or retention of advance against equity and that payments made through third parties would not be allowed. This conveyed the sense that the onus of conversion is on the investor with no allowance for the FIPB process involved. This has been clarified through the present amendment (circular 2), under which the time limit for making applications for such conversions will be 180 days. The New FDI Policy further permits pre-incorporation/pre-operative expenses to be paid by the foreign investor to the Indian company directly into the bank account of the Indian company – which leaves one guessing how would such Indian company come to have a bank account even before its incorporation.

FDI IN SINGLE BRAND RETAIL

As per the old policy provisions, FDI in single brand retail was allowed up to 51% subject to the approval from FIPB and other conditions as imposed under FDI Policy. Vide the Master Circular No.2 of 2011 DIPP has allowed 100 % FDI in single brand retail segment with an additional condition that “the foreign investor should be the owner of brand”. Hence, only foreign investor who owns a brand can enter into single brand retail segment in India.

PLEDGE OF SHARES FOR ECB

The New FDI Policy now allows promoters of an Indian Company to pledge their shares in an Indian company against external commercial borrowings (ECB) raised by such company from foreign lenders. Further a NRI holding shares in the Indian company may pledge such shares to (i) secure credit facilities given to such Indian company by an Indian bank, and (ii) secure credit facilities given to such NRI/ non-resident promoter of the Indian company or its overseas group company by overseas bank. This relaxation should enable making inflow of funds via ECBs more attractive to financial institutions and should give a boost to access of overseas/ECB funds to Indian Companies. Normally after 3 to 5 years from the date of investment, the investor exit from the Company either through IPO / buyback by the promoters / selling to third party. Now, vide Master Circular No.2 of 2011 DIPP has clarified that any of above said instruments with in-built options of any type (i.e. exit by way of buy back or selling to third party) will not be considered as FDI and it will be treated as ECB and subject to compliance with ECB Policy.

RELAXATIONS CONCERNING ESCROW ACCOUNTS

The New FDI Policy permits foreign investors to open escrow accounts in India towards payment of share purchase consideration or for keeping securities. The approval earlier required from RBI can now be obtained from the authorized dealer bank.

OPENING OF NON-INTEREST BEARING ACCOUNT BY NON-RESIDENT

As per the revised policy initiative, only authorized dealers are now permitted to open and maintain non-interest bearing Escrow accounts in Indian Rupees in India under automatic route, on behalf of the non-residents, towards payment of share purchase consideration and/or for keeping securities to facilitate FDI transactions, subject to the terms and conditions as specified by RBI.

INCREASING FDI LIMIT IN TERRESTRIAL BROADCASTING/ FM RADIO

The New FDI Policy has increased the permitted FDI in terrestrial broadcasting/FM Radio to 26%. The Old FDI Policy provided a cap of 20%. The increase of the cap from 20% to 26%, although falling short of the wish of the industry, will further help the cash-strapped FM radio sector to leverage funds through FDI to meet the expansion and roll out plans in tier-2 and tier-3 cities.

INDUSTRIAL PARKS

The New FDI Policy has now included ‘basic and applied R&D on bio-technology, pharmaceutical sciences/ life sciences’ as an industrial activity for setting up industrial parks under the 100% holding vide automatic route. This would thus open the gates for automatic route investments in projects in which quality infrastructure exists in the form of plots of developed land or built up space or a combination with common facilities for the said activities.

EDUCATION SECTOR AND OLD-AGE HOMES

As per the old exiting policy, 100% FDI was permitted in construction development under the automatic route subject to conditions like minimum build up area, minimum capital requirement, lock-in period, etc. Vide Master 2 of 2011 DIPP clarified that the conditions imposed for construction development activities shall not be applicable for construction of

schools, college, university, etc and in respect of old-age homes. Hence, the construction development companies can utilize this effectively to get more FDI without any conditionality.

REAL ESTATE SECTOR

The New FDI Policy has delinked construction developments concerning education sector and old-age homes from the real estate construction and thus has set the construction and development activity for these two purposes free from the conditions otherwise applicable on real estate construction. These conditions include minimum built-up area, minimum capitalization of \$5 million and lock-in period of three years. Hotels and tourism, hospitals, SEZs and investment by NRIs were already kept outside these conditions in the Old FDI Policy.

AGRICULTURE SECTOR

Under the New FDI Policy apiculture (bee-keeping) has been allowed under the category of permitted agricultural activities under controlled conditions with 100% holding under automatic route. The Old FDI Policy permitted investments in floriculture, horticulture and cultivation of vegetables and mushrooms in a similar manner. This move is a step forward in rationalising the controls and restrictions on FDI in agriculture sector on the one hand and to necessity to bring home the needed technology and expertise to keep afloat the agricultural activities not doing well.

All the above initiatives by the Government of India outline the Government's focus on enhancing the FDI inflows, besides creating a conducive investor-friendly environment for the foreign players.

FINDINGS AND IMPLICATIONS

The new revised policy document facilitates better comprehension and readability of the FDI policy framework by re-organizing similar subjects under common chapters. Although, as compared to the previous modified policy in April 2011, the new policy appears to be jaded with largely incremental advancements and clarifications. It is devoid of any material changes in any sector that is of significance in the overall development of the economy. The revised policy initiatives in issuance of equity shares is a sigh of relief for domestic firms as it has brought in its forth greater flexibility and ease to get an investment dose of the foreign capital. The companies operating in automobile components, telecom and power have been benefitted from the amendments related to the conversion of imported capital goods into equity. Some of the changes introduced in the FDI policy related to exempting education and old-age homes from minimum area, minimum capitalization norms and enlargement in scope of FDI in Industrial Park and Apiculture are welcome move. Though the 2011 consolidated FDI policy has liberalized rules to a greater extent yet some concerns still remain to be sorted out and pondered over seriously in order to fully reap the benefits of enhanced FDI in our much volatile economy. The DIPP in its consolidated FDI policy issued on 30th September 2011, had laid down that equity instruments, rather having inbuilt options or supported by options, sold by third parties, would lose their equity character and such instruments would have to comply with the ECB guidelines. Now, since call and put options are ever-present in most share purchase agreements, the inclusion of this clause threatened several existing and future investments. Based on the enormous negative feedback, the DIPP in an important move on 31st Oct 2011 has deleted this clause. The additional condition as to ownership of the brand for permitting 100% FDI in single-brand retail trade is likely to hurt investment and expansion plans for foreign as well as Indian retailers. Some of the other much anticipated reforms, for instance enhancing of FDI limits for multi-brand retail sector, defense sector, relaxation of conditionalities for FDI into construction-development sector, remain unaddressed. The amendment relating to Real estate sector requires more clarity in terms of its applicability and scope as the same is likely to have far reaching impact on flow of foreign investments in India and flexibility to foreign investors in structuring their investments. With 100 percent FDI in agriculture sector, the new policy can lead to increasing dependency on foreign companies and shut down of small domestic firms not in a position to keep up with the foreign players.

CONCLUSION

To ensure steady flow of FDI there has been always a demand from the investor circles that legal framework should be so simplified and slackened that investors have an ease in investing. But the investor destinations inherently and specifically the emerging economies like India; many times have to face contradictions and paradoxes with its domestic demands i.e. protecting the interests of the domestic producers and in parallel to promote scales of FDI as well. The domestic participants and International firms can look forward to the measures announced in Circular 2 as a crucial tool to promote the competitiveness of India as an investment destination, instrumental in attracting higher levels of FDI and technology inflows into the country. Thus it can be concluded that the revised policy norms issued by Government of India will definitely provide a level playing field for the domestic participants to uphold the thrust of the foreign players and together they can promote Indian economy to new dimensions.

REFERENCES

- [1] Misra, S.K. (2000). "Indian Economy", Himalaya Publishing House, 18th Edition, p. 739 New Delhi
- [2] Press Release on Circular 2 of 2011, Department of Industrial and Policy and Promotion, Ministry of Commerce and Industry Government of India.
- [3] "Report of the Committee on Liberalization of Foreign Institutional Investment"; Government of India, Ministry of Finance, Department of Economic Affairs (June, 2004)
- [4] "Which Foreigners are Worth Wooing? A Meta-Analysis of Vertical Spillovers from FDI" William Davidson Institute Working Paper, 996.
- [5] "Assessing the impact of the current financial and economic crisis on global FDI flow", UNCTAD, January 2009
- [6] <www.business.mapsofindia.com/india-gdp/sectorwise/services-sector/growth-rate.html>
- [7] "New consolidated FDI policy, keeping the course in testing times", Manoj Kumar, Accessed on October 10 2011, <www.hammarabisoloman.com>

Perceived Impact of Science and Technology for Empowering Rural Women

Aditi Vishnoi¹, Vandana Verma² and Sarita Verma

¹Faculty of Home Science, TMU

²HOD, Dept. of Home Science, TMU

Abstract— Science and technology have been an integral part of Indian civilization and culture over the past several millennia. Few are aware that India was the fountainhead of important foundational scientific developments is approaches. A great deal of this traveled outwards from India. Equally, India also assimilated scientific ideas and techniques from elsewhere, with open-mindedness and a rational attitude characteristic of a scientific ethos. Even today the rural women have to walk a few kilometers distance to obtain drinking water from well, pond or river and a few more km and to obtain fuel wood. This indicates that most of the technologies available in the "Super market" are developed in and for highly urbanized societies. We therefore, need to introspect and innovate both in Social Engineering and Physical Engineering the benefits of these technologies and to ensure that these are percolated to rural section in general and to the rural women in particular.

Keywords: Science & Technology, Traditional Technologies

INTRODUCTION

Science and technology have profoundly influenced the course of human civilization. Science has provided remarkable insights into the world we live in. The scientific revolutions of the 20th century have led to many technologies, which promise to herald new ears of advancement in many fields. As we stand today at the beginning of a new century, we have to ensure fullest use of these developments for well being of the masses. Science and technology have been an integral part of Indian civilization and culture over the past several millennia. Few are aware that India was the fountain head of important foundational scientific developments are approaches. India's traditions have been founded on the principles of universal harmony, respect for all creations and an integrated holistic approach. This background is likely to provide valuable insights for further scientific advances. (Science and Technology Policy 2003)

During the century prior to independence there was an awakening of modern science in India. Since independence, India has been committed to the task of promoting the spread of science and technology to the masses. The key role of technology as an important element of national development is also well recognized. The Scientific Policy Revolution of 1958, the Technology Policy Statement of 1983, Science and Technology Policy 2003 enunciate the principles on which the growth of Science and Technology in India is based. These policies have emphasized self reliance, as also sustainable and equitable development. They embody a vision and strategy that are applicable today and would continue to inspire us in our endeavors. Science and Technology achievements include very significant increase in food production, eradication or control of several diseases, increased life expectancy of our citizens and improved quality of life for the people.

While these developments have been highly satisfying, one is also aware of the dramatic changes that have taken place and continue to do so, in the practice of science, and technology developments and their relationship with impact on society. Major experimental facilities even in several areas of basic research, require very large material, human and intellectual resources. Science and Technology have become so closely interwined, and so reinforce each other that, to be effective any policy needs to view them together.

Science and technology in its wide meaning denotes the scientific know-how and the practical art. In fact, science is systematic study and technology is body of knowledge, skill and procedures of making the use of scientific principles for well being of society. The word technology is used loosely to comprise the applications of scientific discovery and the material products which from the central aspects of man. In short technology includes the objects of material cult, live.

Technologies are bodies of skills, knowledge and procedures for making, using and doing useful things. Technologies are tools, techniques, products or processes, physical equipment or method of doing or making (Goldring 1976). Technology involves the application of Science and Technology for the practical use, enabling men to use them more comfortably and securely (Hoda, 1979). Technology has been responsible for changing the structure of society. It must be emphasized that technology is essential for people's development as this brings ease, comfort, health, pleasure and emancipation.

The present paper is an attempt to analyze perceived impact of science and technology for the empowering rural women

RESEARCH METHODOLOGY FOR THE STUDY

The study was conducted in Haryana State because of familiarity of researcher with rural scenario conditions, environment and dialect.

attracted over US\$25 billion in foreign investment and from March 9 to May 19, 2009, foreign institutional investors (FII) invested nearly US\$4.2 billion in the Indian stock markets.

In February 2009, the Government made two significant changes in the foreign investment policy. Firstly, if a foreign investor invests up to 49% in an Indian owned and controlled investing company, which in turn makes a downstream investment in a target Indian company, the total foreign investment in the downstream target company will be considered to be nil. Secondly, it was made mandatory to take Government approval for the transfer of ownership and control of Indian companies to non-resident entities in restricted sectors such as telecom, defense production, air transport services and broadcasting. To make the investment in India attractive, investment and returns on them are freely repatriable, except where the approval is subject to specific conditions such as a lock-in period on the original investment, dividend cap, foreign exchange neutrality, etc. as per the notified sectoral policy.

MNCs that wish to invest in India would benefit greatly from a highly educated population. This would aid the company in such areas as employee training time, recruiting management from within the country, and implementing new and more advanced procedures for the company.

Some businesses would benefit from this more than others based on the amount of technical and advanced work that is involved with the company. For example, a manufacturing company that only assembles one simple product, like an aftermarket hitch for a pick-up truck, probably would not benefit as much as a company that designs the pick-up truck and all the new and advanced features accompanying it, like more fuel efficient engines and a 4-wheel-drive system that uses computers to displace power to different wheels to prevent slipping on snowy roads.

Given the low per-capita income of the country, India still would certainly represent an excellent place for business in coming years. This is because the per capita income of the country as a whole might be a misleading statistic. Seventy-five percent (75%) of the Indian population lives in over 600,000 villages in the country. This leaves the remaining 25% possibly in more advanced, and more populated areas of the country that would probably have a much higher per capita income. Those living in the villages would considerably lower the per capita income. They possibly live in seclusion and are highly self-sufficient whereby capita income would probably not be a good indication of their wealth. The ones living in the cities and larger metropolitan areas that are not nearly as self-sufficient could be measured in those terms with more confidence.

HISTORICAL BACKDROP

One of the oldest civilizations in the world, India has expanded and flourished since the 3rd and 2nd millennia BC. The classical Indian culture is based primarily on the merger of the Aryan and Dravidian cultures in or about 1500 BC. As the country progressed into the Golden age India began to truly take a foothold within the regions scientific and cultural landscape. With aggressive growth and expansion many times unrest can also occur resulting in conflicts between the parts of the continent. This unrest led to the unseating of the Mughal Dynasty (which led India for three centuries) to the British Empire in the 19th century. British rule remained until 1947 when a primarily nonviolent movement led to the country's independence. Along with the liberation of India, communal and political dilemmas led to the formation of two separate countries, Pakistan and India. Since independence, India has grown in many ways. Even with challenges related to poverty, environmental degradation and overpopulation, India has been able to grow economically as well as technologically.

GENERAL FACTS AND FIGURES

India is the seventh largest country from a surface area perspective in the world and boasts the second highest population with over 1.19 billion people, behind only China who has 1.34 billion. It has extensive coastline with its western shores facing the Arabian Sea, the southern area on the Indian Ocean and eastern coastline reflecting the Bay of Bengal. It has several neighbors connected to its borders with Pakistan on its northwest border, China, Bhutan and Nepal to the north and Burma and Bangladesh to the east. Its capital is New Delhi and its largest city is Mumbai with nearly twelve million people. Financially speaking the following results indicate how India has become a fairly significant figure in the global market place:

Gross domestic product: \$1,310.2 billion; Gross domestic product (PPP): \$3,778.2 billion; Gross National Income per Capita (Atlas): \$1,180; Gross national income (PPP): \$3,250 (Source: World Bank, 2009).

MULTI CULTURAL, MULTI RELIGIOUS & MULTI LINGUAL ENVIRONMENT

India presents a unique case of a multi cultural, multi religious and multilingual environment, which has implications for all aspects of life. The major religions of India are Hinduism (80.5%), Islam (13.4%), Christianity (2.3%), Sikhism (1.9%) and 1.8% making up the remaining religions. There are also several languages spoken across the country, including Hindi (spoken by 41% of the population). The central government recognizes Hindi as the official language; however, when business is conducted internationally it is English that is preferred.

Sampling Procedure

Under sampling procedure selection of district, selection of block, selection of villages and selection of respondents were taken.

Selection of Districts

On an agroclimatic basis the State of Haryana comprises of 19 district, is divided into two broad agroclimatic zones. Four districts, two each from eastern and western agroclimatic zones were selected randomly. Accordingly, Yamunanagar, Kurukshetra from eastern zone and Hisar and Fatehabad from western zone were the selected districts.

Selection of Blocks

From Hisar district, block I, from Yamunanagar, bilaspur block, from Kurukshetra, block I, and from Fatehabad block I was selected randomly.

Selection of Villages

From Yamunanagar District Sasoli and Kansapur, from Kurukshetra district Jyotisar and Joganakhera, from Hisar district Salemgarh and Jakhodkhera and from Fatehabad Matana and Bigharh villages were selected randomly.

Selection of Respondents

A total of 250 respondents were selected by drawing pps sampling on basis of land holding from eight selected villages. From Kanaspur, Joganakhera, Salemgarh, Jakhodkhera, Matana and Bigharh thirty respondents were taken from each village. While thirty five respondents were taken from Sasoli and Jyotisar as they were bigger villages. These 250 respondents were from different land holding categories.

RESULTS OF THE STUDY

Perceived impact of adoption of thousand technologies in rural homes

Impact was operationalized as resultant effect from any activity. Impact can be both favourable and unfavourable on rural communities. In present study impact of adoption of various household technologies on rural homes as perceived by rural women was assessed.

Data presented in Table 1, depicts the perceived impact of adoption of household technologies in rural homes. Impact was perceived under different sub heads and results are presented below:

Table 1: Perceived Impact of Adoption of Household Technologies

Sr. No.	Perceived Impact	Freq.	%
A)	Educational and Training		
➤	Children studying hours increase	186	74.40
➤	Undertake short term / Vocational training increase	43	17.20
➤	Better schooling of children	124	49.60
B)	Impact of income :		
➤	Income increases due to involvement in income generating activities.	92	36.80
➤	Saving habit increases	130	52.00
➤	Expenses decrease	163	65.20
C)	Impact of health :		
➤	Incidence of disease among family members decrease	122	48.80
➤	Smoke and related hazards decrease	149	59.60
➤	Reduction in fatigue	158	63.20
➤	Early pregnancies decrease	22	8.80
➤	Increase in immunization	199	79.60
➤	Spacing between children increase	93	37.20
D)	Impact on quality of life :		
➤	Better housing structures	178	71.20
➤	Better nutrition	173	69.20
➤	Enhanced comforts	189	75.60
➤	Physical burden	158	63.20
➤	Household appliances increase	192	76.80
➤	Time spent in fetching and storing water decrease	210	84.00
➤	Drudgery decrease	158	63.20
E)	Impact on social life :		
➤	Participation in social events, wedding, funerals, births and other celebrations increase	156	62.20
➤	Participation in religious activity increase	130	52.00

Table 1 (Contd.)

... Table 1 (Contd.)

➤	Visit to town / cities increase	145	58.00
➤	Time spent on watching TV or Radio increase	206	82.40
G)	Increased on violence :		
➤	Incidence of forced pregnancies decrease	59	23.60
➤	Physical abuse decrease	101	40.40
➤	Forced abortion decrease	62	24.80
H)	Impact on decision making		
➤	Participation in decision related to money matters increase	164	65.60
➤	Participation in home decision increase	145	58.00
➤	Participation in child care activity increase	193	77.20
➤	Household purchases increase	190	76.00
J)	Impact of environment :		
➤	Indoor pollution decrease	48	19.20
➤	Improvement in sanitation facility	212	84.80
➤	Improvement in ventilation	191	76.40
➤	Awareness on environmental issues increase	42	16.80
K)	Self		
➤	Change in attitude	200	80.00
➤	Change in knowledge	215	86.00
➤	Self respect	192	76.80
➤	Self confidence	206	82.40
➤	Self satisfaction	202	80.80
➤	Decision making ability	221	88.40

EDUCATION AND TRAINING

Perceived impact of adoption of household technologies in rural homes on education and training shows that majority of respondents (74.40%) perceived that children studying hours has increased and this may be due to availability of electricity and other household comforts. Further 49.60 per cent of respondents perceived that better schooling is being provided to children due to increased income while 17.20 per cent of rural women perceived that they can take up vocational training as time gets generated due to adoption of household technologies.

IMPACT OF INCOME

Regarding impact on income 52 per cent of respondents perceived that saving habit have increased due to adoption of improved technologies. Further, 65.20 per cent of respondents perceived that expenses will decrease due to less expenses on improved technologies. However, 36.80 per cent of respondents perceived that income will increase due to involvement in income generating activities.

IMPACT ON HEALTH

Due to adoption of improved household technologies like health and sanitation, kitchen related technologies 48.80 per cent of respondent perceived that incidence of disease has decreased due to frequent visit to hospitals, PHCs and increase in immunization among children and pregnant women. Smoke related hazards such as asthma, TB, eye infection etc. have decreased as perceived by 59.60 per cent of respondents due to improved technologies like LPG, proper ventilation etc. Further, 63.20 per cent of rural women perceived reduction in fatigue due to adoption of improved household technologies. Increase in immunization was perceived by 79.60 per cent of rural families. Spacing between children has increased as perceived by 37.20 per cent of rural women due to adoption of family planning methods. Early pregnancies have decreased on perceived by 8.80 per cent of respondents due to mass media exposure, more social contracts and visit to PHCs etc.

IMPACT OF QUALITY OF LIFE

Perceived impact of adoption of modern households technologies was perceived by respondents as better housing (71.20%), better nutrition (69.20%) and enhanced comforts (75.60%) 63.20 per cent perceived relief from physical drudgery which was more with traditional technologies and relief due to adoption of modern technologies. Further, 76.80 reported increase in household appliances. Eighty four per cent of rural women reported that there was decrease in time spent in fetching and sotring water due to ready availability of tap water. Increase in standard of living was perceived by 79.20 per cent.

IMPACT ON SOCIAL LIFE

Due to adoption of modern household technologies now rural women can spare more time and thus women participation in family events (62.4%), participation in religious activities (52%) increased. Further, 82.4 per cent of rural women reported increase in time spent on watching TV. Fifty eight per cent of rural women perceived that social participation of women increased due to adoption of modern household technologies.

VIOLENCE

Due to adoption of modern household technologies incidence of forced pregnancies has decrease (23.6%), forced abortion decreased (24.8%) and physical harassment also decrease (40.4%).

IMPACT ON DECISION MAKING

Due to adoption of modern household technologies women exposure has increased. Now they have started participating in various decisions. Perceived impact on decision making shows that decision making has increased related to money matters (65.6%), home decision (58%), child care activity (77.20%) and household purchased (76.0%).

IMPACT ON ENVIRONMENT

Due to adoption of improved modern household technologies indoor pollution has decreased as perceived by 19.20 per cent of rural women. Sanitation facility has improved to an extent by 84.80 per cent of rural families, 76.40 per cent perceived better ventilation facility which in turn effects environment. Further 16.870 per cent of respondents reported that awareness about environmental issues has increased as modern technologies are adopted.

IMPACT OF SELF

These effect were among the indirect impact of adoption of modern household technologies. Majority of women perceived that adoption of modern household technologies improved their decision making ability (88.4%) followed by change in knowledge (86%), development of self confidence (82.40%), self satisfaction (80.80%), change in attitude (80%) and self respect (76.80%).

Hence, it can be concluded that adoption of modern households technologies has had both direct and indirect positive impact on rural women and rural communities. Adoption of technologies can bring about substantial change in the life of rural communities.

REFERENCES

- [1] AFPRO. 1993. Benefit from biogas-women's perspective. *Development and Ecology*, Vol. 1, Issue 1.
- [2] AFPRO. 1994. The biogas network programme evaluation. *Development and Ecology*, Vol. 1, Issue 5.
- [3] Agarwal, A. and D.R. Arora. 1989. Factors affecting gohar gas plants in Ludhiana. *Social Change* 19(1) March pp. 68-71.
- [4] Agarwal, S. and Singh, T.R. 1973. Mother's compliance with prescribed recommendations on immunization and their source utilization pattern. *Indian Journal of Extension Education*, Vol. XIX.
- [5] AICRP, HAU. 1987. Report on All India Co-ordinated Research Project in Home Science, Department of F.R.M. College of H. Sc., CCSHAU, Hisar.
- [6] Anu. 1994. Impact of household sanitation technologies on family living in rural households. M.Sc. Thesis, CCSHAU, Hisar.
- [7] Bhagwat, R. 1991. Adoption of smokeless chulha. *Maharashtra Journal of Extension Education*, 10 (2) Nov. p.p. 215-220.
- [8] Bhat, C.M., R. Bhagat and A. Jhamtani. 1991. Acceptability and utilization of smokeless chulha in Delhi village. *Maharashtra Journal of Extension Education*, 10(2), Nov., pp. 246-252.
- [9] Bhati, S.K. and Laharia, S.N. 1990. Biogas plants-women's benefactor. *Kurukshetra*, pp. 41-44.
- [10] Bose, S.P. 1981. Relative influence of socio-economic factors on the acceptance of cow-dung gas plants by the farmers when exposed to extension teaching. M. Sc. Thesis, ICAR, New Delhi.
- [11] Chaudhary S.N. 1993. Biogas and women. *Social Change*, Vol. 23, No. 1, pp. 76-82.
- [12] Chaudhary, A. 1997. Development of a standardized rural kitchen, M.Sc. Thesis, Department of F.R.M. CCSHAU, Hisar.
- [13] Cherian, A. and Chandra, A. 1989. Impact of television on acquisition and retention of knowledge by rural people. *Indian Journal of Extension Education*, Vol. XXV Nos 3 & 4.
- [14] Chole, 1990. *Renewable energy in action*, Govt. of India, New Delhi.
- [15] Day, D.L., Anderson, J.C. and Steinberg M.P. (1990). Biogas plants for small farmers. *Biomass*, Vol. 1, No. 2 pp. 83.
- [16] Dhillon, M.K., Miglani, S.S. and Singh, M.K.B., 1993. Existing housing conditions in rural areas. Paper presented in seminar on Home Management Research - Major Thrust Area.
- [17] Digraskar, R.K. and Wangikar, S.D., 1993. An investigation into attitudes of the farmers towards the use of biogas plants, *Maharashtra Journal of Extension Education*, Vol. XII, pp. 335-339.
- [18] Digraskar, R.K., Wangikar, S.D. and Malral, V.K. (1992). A study on the utility perception of biogas plants. *Maharashtra Journal of Extension Education*, Vol. XI, p.p. 239-244.
- [19] Girisppa, S., 1991. Energy use in rural areas process, problem and prospects. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
- [20] Gurcharan, S. Basran. 1987. Motivational and resistance forces related to the acceptance of new ideas in farming. *Indian Journal of Extension Education*, Vol. II, p.p. 107-115.
- [21] Hosamni, V.B. and Sundarswamy, B. 1996. Factors associated with knowledge level of rural women. *Indian Journal of Extension Education*, Vol. 32, Nos 1 to 4.
- [22] Jain, S. 1978. Different type of biogas plants. Paper presented at Indian Society of Technical Education.
- [23] Jindal, A. 1992. Housing needs in content of rural women. M.Sc. Thesis, HAU, Hisar.
- [24] Kalantri, L.B. and V.R. Kubde. 1987. Use of biogas towards agricultural and domestic purposes. *Maharashtra Journal of Extension Education*, Vol. VI pp. 197-198.
- [25] Kar, A. 1992. Energy resources assessment and planning of a village cluster in drought prone lateritic soil West Bengal. *Economic Affairs*, Calcutta, 37 (4): 237-240.
- [26] Karnataka Government, 1983. *Biogas technology a practical handbook*, Vol. 1, Tata Mc Grow Hill Publishing Co. Ltd.
- [27] Karwasra, S. 1997. Acceptability of solid waste disposal system - a case study. M.Sc. Thesis, CCSHAU, Hisar.

Restructuring the Financial Institutions for Rural Development

Manoj Agarawl¹ and Ashendra Kumar Saxena²

¹Sr. Lecturer, Mahaveer University Moradabad

²Reader, Teerthanker Mahaveer University Teerthanker, Moradabad

Abstract—Often overlooked is the importance of banks to revitalization efforts. Financial institutions in a community can form the core of economic development. Although they shouldn't be expected to finance revitalization programs singlehandedly, they should be considered as essential to success. Banks should realize that in a society they are also accountable to the masses besides to their stakeholders. Risk management is not avoiding risk, but taking risks and managing them well. Interventions in developing countries have increasingly sought to aid public institutions of the rural sector in their effort to adapt to the new economic context, and in the establishment of new relations with farmers and other actors of civil society. Thus partners in development have been able to define and perfect methodologies and analytical instruments, and models of organization (after they have been tested in real situations) that respond to current objectives of food security and sustainable economic and social development. Since the beginning of the 1990s, an increasing number of countries have made requests to institutions engaged in development support. These requests have been for support in the restructuring of public institutions, and for the building of professional agricultural organizations.

Keywords: Economic Development, Risk

RESTRUCTURING THE FINANCIAL INSTITUTIONS FOR RURAL DEVELOPMENT

Financial institutions in a community can form the core of economic development. They shouldn't be expected to finance revitalization programs singlehandedly, and considered as essential to success. Yet banks and other local financial institutions have largely ignored local improvement efforts in recent decades. In an increasingly focused effort to satisfy their stockholders, they have looked for investments which provide the highest rate of return. As a result, their investment money has gone elsewhere, to other regions of the country or even to other parts of the world. In doing so, often they have ignored their responsibilities to the local community in which they are based, and from which comes most of their business. Local banks need to be reacquainted with their need to be locally involved.

How successful a country is in reaping the benefits of industrialization depends on many factors, most notably the policies for industrial development and the strategies for implementation of the policies. Efficient industrialization requires prices of the productive factors (capital and labour) to reflect their real values, and incentives, if any, are provided in an equitable manner, i.e., incentives for exports are as favorable as incentives for import substitution.

In my view, the first and foremost step that needs to be taken by our banks and financial institutions is to look at each enterprise / firm as unique units, appraise their technical feasibility, financial viability, and bankability as well as apply the risk and sensitivity analysis.

The pro-active role of banks could include specific measures and steps like:

- Providing information and advice to make it easier for small firms to compete, particularly, in the context of global competition so that the small enterprises look at globalization as a challenge and not as a threat;
- Aiding the process of sub-contracting;
- Financing industrial infrastructure that promote better links between large and small firms;
- Providing working capital in time;
- Rationalizing requirement of collateral security, or by innovating alternative means of securing loans while ensuring that such alternative means do not increase the risk to them;
- Designing simpler lending criteria and procedures that will aim to collect the essential data and information so that set standards (or templates) can be arrived at while eliminating non-essential details; and
- By putting in place an effective monitoring system together with concurrent evaluation of the units financed.

RESTRUCTURING RURAL INSTITUTIONS

Interventions in developing countries have increasingly sought to aid public institutions of the rural sector in their effort to adapt to the new economic context, and in the establishment of new relations with farmers and other actors of civil society. Thus partners in development have been able to define and perfect methodologies and analytical instruments, and models of organization (after they have been tested in real situations) that respond to current objectives of food security and sustainable economic and social development. Since the beginning of the 1990s, an increasing number of countries have made requests to institutions engaged in development support. These requests have been for support in the restructuring of public institutions, and for the building of professional agricultural organizations.

Prerequisite: Redefining the Role of the State

Policies seeking to establish market economies lead to a review of the role of the state. It is required in the new context to concentrate on public service, carrying its functions in a cost efficient manner. This public service mission fits into the following major functions:

Guidance Function

Gathering of information useful to the agricultural sector, macroeconomic analysis, and forecast of the sector's development, proposing agricultural policy, monitoring and coordination of development actions.

Regulatory and Control Function

Preparing and adapting laws and regulations seeking to encourage development

Natural Resource Conservation Function

Taking stock of resources, classifying them, determining and implementing, with citizen participation, plans for their rational development and conservation.

BASIC PRINCIPLES

Restructuring is based on the new role of the state and it involves a complete structural transformation: dissolving, revamping, and creating new types of institutions. It takes into consideration problem solving, especially personnel problems, which its implementation causes.

UNDERLYING PRINCIPLES OF RESTRUCTURING

- A clear separation of public service functions from those of the private sector, and the establishment of new types of relations between the two sectors;
- A general reconfiguration of the institutional landscape based on the new assignment of the state, and a greater role for representative organizations of civil society;
- Decentralization of powers and responsibilities, giving local representative organizations more freedom and decision-making powers, and means to carry them out;
- Organizing the farming profession and its institutionalization, to create an autonomous and associative sector capable of reconciling the general interest and economic efficiency;
- A change in attitude by the public sector toward actors of civil society, replacing centralized planning methods with dialogue and collaboration;
- A broad approach to development, integrating all factors (agro-ecological, human, economic, time, etc.);
- A rational management of financial and human resources based on continuing evaluation of results and improvements on performance.

METHODOLOGY FOR RESTRUCTURING PUBLIC INSTITUTIONS

The process of restructuring takes place in three main stages:

- basic institutional analysis and the design of the master plan,
- detailed preparation of the restructuring plan,
- implementation

Without being considered a stage as such of the process, an evaluation of the impact of restructuring on development must be undertaken two or three years after implementation, in order to make adjustments or to integrate additional inputs.

Institutional Analysis and the Design of the Master Plan for Restructuring

The first stage is the basic analysis, which helps to bring out the necessary elements for the design of restructuring proposals to be submitted for discussion and decision by all actors involved. The analysis basically involves:

- the activities of agricultural public institutions, to identify those public services which must continue to be provided by the restructured institutions, and those which must be transferred to the private sector;
- the institutional aspects of existing agricultural public services: their organization, internal and external relations, decision-making process, monitoring of implementation, human, natural and financial resource management, etc. and the evaluation of their technical capacity.
- Farmers' evaluation of services provided by public institutions, and the nature of relations they wish to have with the latter, as well as knowledge of their needs and aspirations in terms of development support.

PREPARATION OF A DETAILED PLAN FOR RESTRUCTURING

The detailed plan for restructuring is prepared on the basis of the choices made by national authorities after extensive consultations with the relevant actors, and their partners in development on the master plan presented. It comprises:

1. A reminder of the role of the state and the presentation of the total institutional set-up.
2. The details of the organization of structures at different levels, the legal status and the financing mechanisms of the institutions resulting from restructuring.
3. The principles of work organization and the type of internal and external relations, in a spirit of the decentralization of responsibilities.
4. The assignment for departments and the detailed description of profiles at all levels, in the form of standardized filing systems.
5. Quantitative evaluation, qualitative composition, and geographic distribution by department, of required workers.
6. An outline of the training plan for the personnel of the restructured institution and the technical assistance needed for mastering the new methodologies.
7. Evaluation of the need for extra equipment and the budgets required for the effective working of the departments.
8. The major channels of technical and managerial information systems.
9. The basic rules for stream-lined management of human resources: its continuous adaptation to the requirements of the jobs to be done, continuing education and improvement of working conditions and job performance.
10. Human and financial implication of restructuring.
11. The plan for implementation, established at the last stage, makes all the aspects of restructuring coherent.

Implementation of Restructuring

Institutions to be restructured cannot, obviously, be put in charge of implementing their own restructuring. Other public institutions that need to be restructured are not recommended either to properly conduct such an operation. Therefore, it is necessary to put in place ad hoc structures that could implement the restructuring, avoiding bureaucracy and unjustified influence.

ACCOMPANYING MEASURES

Restructuring would not by itself bring about agricultural development. Its effectiveness depends on supplementary measures taken to transform the overall legal, institutional, and economic framework, in order to create a more favorable environment for agricultural development. Among the measures that must be taken to support the restructuring process, it is important to note:

- The reform of legislation on professional agricultural organizations and associations
- Putting into place a system of agricultural credit capable of mobilizing rural savings, administered by farmers, and responding to the needs of different categories of farmers
- The restructuring of agronomic research, to take into consideration the problems of producers
- Restructuring all public institutions, civil service reform and the reform of the formulation and implementation of budgets.

REFERENCES

- [1] Bagehot, Walter. *Lombard Street: A Description of the Money Market*. New York: Scribner, Armstrong & Co., 1873.
- [2] Board of Governors of the Federal Reserve System. *Banking and Monetary Statistics, 1914–1941*. Washington, DC, 1943.
- [3] Bremer, Cornelius D. *American Bank Failures*. New York: AMS Press, 1968.
- [4] Chandler, Lester V. *America's Greatest Depression, 1929–1941*. New York: Harper and Row, 1970.
- [5] Friedman, Milton, and Anna J. Schwartz. *The Monetary History of the United States, 1867–1960*. Princeton, NJ: Princeton University Press, 1963.
- [6] Nadler, Marcus, and Jules L. Bogen. *The Banking Crisis: The End of an Epoch*. New York, NY: Arno Press, 1980.

Information and Communication Technology and Women Empowerment

Vandana Verma¹ and Ambuj Kumar Agarwal²

¹HOD, TMU, Moradabad

²Sr. Lecturer, CMCA, TMU, Moradabad

Abstract—For centuries, women in this country have been socially and economically handicapped. They have been deprived of equal participation in the socio-economic activities of the nation. The concept of gender equality is a common concern all over the World. The same has now acquired new dimensions with the advent of Information and Communication Technology (ICT). The ICT has a potential to bring development for a nation. It can reduce trade distortions, eliminate poverty, empower weaker segments including women, etc. The same is, however, possible only if a nation follows sound ICT strategies and policies. We have to set our priorities to those areas where we are lagging far behind. One such area is the unequal access of ICT to women.

Keywords: Information Technology, Poverty, Policies

INTRODUCTION

Information and Communication Technologies comprise a complex and heterogeneous set of goods, applications and services used to produce, process, distribute and transform information. Traditional technologies continue to be important for large numbers of people around the world, particularly in rural areas. However, new technologies have a vast potential for empowerment which needs to be fully exploited. Over the past decade, there has been a growing understanding that these technologies can be powerful instruments for advancing economic and social development through the creation of new types of economic activity, employment opportunities, improvements in health-care delivery and other services, and the enhancement of networking, participation and advocacy within society. ICT also have the potential to improve interaction between Governments and citizens, fostering transparency and accountability in governance.

While the potential of ICT for stimulating economic growth, socioeconomic development and effective governance is well recognized, the benefits of ICT have been unevenly distributed within and between countries. The society today is a high tech knowledge society. Technological knowledge thereby becomes the fundamental resource of all economic and development activities of which women should have an equal part. The benefits of information and communication technologies are not limited to any segment of society but freely flowing to all, subject to resource accessibility and discrimination. Technology has provided expanding avenues to women as well. The areas in which information and communication technologies (ICT) can put a greater control in the hands of women are enormous and continuously expanding from job management to governance. ICT has the potential to reach women and empower them to make informed decisions.

NEED FOR WOMEN EMPOWERMENT

In rural areas literacy rate of women is meagre 46% as compared to 71.1% among males. Even in urban areas there is a difference of 13%, with male literacy rate being 86.4%, while that of women is only 73%. The isolation of women from the mainstream economy and their lack of access to information because of societal, cultural and market constraints have led to their distancing from the global pool of information and knowledge. The widening technological gap between the sexes has slowly been observed to be reinforcing traditional forms of power dynamics and hierarchies, whereby gains made in social and economic empowerment in the last two decades are left redundant. In the new knowledge economy, a large proportion of women are ill-equipped in terms of ICT capacities.

WHAT IS EMPOWERMENT?

It can be defined as shifting of power from powerful to the powerless to bring social equality. Equality is not just a redistribution of power, it is also a question of change in values. The ultimate goal of empowerment is to ensure that women fully participate in the political and social decision making process at the local, regional and national level with a view to achieve political empowerment and gain over household resources but it is not as simple as it sounds. Empowerment is not something that can be transferred from one segment to other segment of society. It is to be acquired. It is the women herself who has to realize her capacity and capabilities to get empowered at all socio-economic and political level. Laws, policies and technologies can only provide an environment to facilitate their empowerment. In rural areas, ICT is an effective mean to provide such an environment.

DEFINITION OF ICT

Information and communication technologies (ICT) comprises complex and heterogeneous set of goods, applications and services used to produce, distribute, process and transform information. The ICT sector consists of segments as diverse as telecommunications, television and radio broadcasting, computer hardware and software, computer services and electronic media (e.g., Internet, e-mail, e-commerce) as well as the content of these media.

Benefits of ICT in Women Empowerment

- Connectivity and Access to Information for Livelihoods and Enterprises
- Mobilization and Education of Women Workers and Advocacy for Worker Rights
- Linking of women producers to global markets
- Efficient communication for micro enterprises of poor women
- Opportunities for Skill-building and Employment
- Opportunities for Self-employment
- Creation of Data-Repositories and Data Management

GENDER EQUALITY AND ICT

While there is recognition of the potential of ICT as a tool for the promotion of gender equality and the empowerment of women, a “gender divide” has also been identified, reflected in the lower numbers of women accessing and using ICT compared with men. Unless this gender divide is specifically addressed, there is a risk that ICT may exacerbate existing inequalities between women and men and create new forms of inequality. If, however, the gender dimensions of ICT—in terms of access and use, capacity-building opportunities, employment and potential for empowerment—are explicitly identified and addressed, ICT can be a powerful catalyst for political and social empowerment of women, and the promotion of gender equality. In the past few years, the global community has seen the “gender issue” come onto the agenda. Despite economic and socio-cultural barriers to women’s use of Information and Communication Technology (ICT), when women are able to use them productively, they can substantially improve their lives and increase their income. They have proved useful in: health care delivery; distance education; enhancing rural productivity through access to market information and access to finance; promoting empowerment and participation in national and international policy processes; improving service delivery by governments; improving environmental monitoring and response systems; and facilitating environmental activism. In general, women make up a small percentage of internet and computer users. This is changing in some countries – generally those which have greater levels of development and gender equality. ICTs are potentially an important knowledge resource for women, but a focus on access is insufficient.

ICT project planning and implementation for social development and gender equality must take place in a context which consists of five main components:

- a. Creating an enabling environment which supports and encourages strategies to promote women’s equal access to and opportunity to benefit from ICT;
- b. Developing content which speaks to women’s concerns and reflects their local knowledge;
- c. Supporting increased representation of women and girls in scientific and technical education;
- d. Implementing e-governance strategies which are accessible to women; and promoting women’s lobbying and advocacy activities

ROLE OF ICT

Constitutional ideal have by and large remained unaccomplished and we have to cover a long distance before the benefits of ICT can be reaped by women effectively. One of the ignored ICT issues in India is the “gender sensitisation” that must be adopted while formulating and implementing the ICT policies in India. It is commonly understood that men and women understand and use Computers and Internet differently. Thus, the policy decisions must make sufficient provision for adopting itself with this aspect. Within India also we must understand that the training, use and adoption of ICT must be “gender neutral”. For a gender neutral technology we have to first place the women on an equal platform. They cannot be put on an equal platform till they have equal capacity and opportunity to use ICT. They cannot also effectively use ICT till their “feedbacks and concerns” are incorporated in the National Policies including the E-governance plans. The position is worst when it comes to women that also rural women.

Thus, ICT can play a major role in women empowerment if they are provided employment opportunities at the village level after providing them suitable training. We have to open more village kiosks so that greater women participation can be there. This cannot happen till we first make the e-governance and ICT strategies and policies transparent and accountable.

IMPROVING WOMEN’S PARTICIPATION IN ICT

Identify Pathways into Specific ICT Careers

This suggests that women choose not to work in technology occupations because they do not understand how to enter this career.

Create Opportunities for Skill Conversion

This necessitates a community recognizing both the existence of skills in women and the potential for the conversion of these to new ICT skills.

Create Multiple Points of Access to ICT Literacy

It may be more useful to think more simply of ICTs as multipurpose tools, and then concentrate on the task for which a tool is needed. Women are not averse to learning skills for tasks they need to do, or that they perceive as useful.

Create Opportunities for Career Migration

Women have embodied for many years the flexible career pattern, and portfolio career proposed now as the model for the new worker in the network society. This has not brought high status and financial reward; it is a main contributor to women remaining lower down the occupational hierarchy.

Overcome Barriers to Entry

(Though targeted selection recruitment and training). - This is one area where there has been a significant amount of success, because it is more amenable to formal mechanisms of control.

Enable Progress and Support Retention Inside Jobs

In an unsupportive community of practice a new participant may remain peripheral and even marginal and eventually 'leak' away.

REFERENCES

- [1] Alper, J. (1993). "The pipeline is leaking women all the way." *Science* (260): 409-411.
- [2] Deakin, R. (1984). *Women and computing : the golden opportunity*, Macmillan. Durnell, A. and et al. (1995). "Gender and Computing: Persisting Differences." *Educational Research*37(3): 219-27.
- [3] Kanter, R.M. (1977). *Men and women of the corporation*, Basic Books.
- [4] Kerr, C. (1963). *The uses of the University*. Cambridge Mass, Harvard University Press.
- [5] Kirkup, G. (2001). 'Getting our Hands on it': Gendered Inequality in Access to Information and Communications Technologies. *Access Denied in the Information Age*.
- [6] Li, N. (2002). *Culture and Gender Aspects of Students' Information Searching Behaviours using the Internet*. Institute of Educational Technology. Milton Keynes, Open University.
- [7] Mitra, A., B, LaFrance, et al. (2001). "Differences in Attitudes between Women and Men toward Computerization." *Journal of Educational Computing Research* 25(3): 227-44.
- [8] Rothschild, J. (1982). *WOMEN technology and innovation*, Pergamon. Segerman-Peck.

Creativity Innovation and Entrepreneurship

Shivani Gupta¹ and Surendra Gupta²

¹Asst. Prof., VIT, Meerut

²Assoc. Prof., MAIMT, Jagadari

Abstract—Creativity and innovation are considered to be inseparable from entrepreneurship, which is in turn manifested in the act of starting up and running an enterprise. Creativity is clearly part and parcel of the entrepreneurial skills required to successfully start a venture. Entrepreneurs and their start-ups are considered to be "important agents of innovation not simply in terms of the products and services they provide, but also in terms of the technologies and processes that they utilize. Start-up entrepreneurs could thus be argued to be, by their very nature, the essence of creativity and innovation. This paper explores ways in which start-up entrepreneurs are creative and innovative. Entrepreneurs generate, develop and implement new ideas for their start-ups, foster a climate that is conducive to creativity and innovation, provide top down support for creativity and innovation in their organizations, and offer innovative products and services through innovative methods of production and delivery.

Keywords: Creativity, Innovation, Entrepreneurship, Entrepreneurs.

OVERVIEW

Entrepreneurs implement creative ideas to introduce innovative products or services, or to deliver products or services in a new, more efficient, and hence innovative way. Innovation in New Product Development could include upgrading an existing product or developing a totally new concept to create an original and innovative product. This is also true for services and processes, thus innovation is recognized in the literature as ranging from the incremental to the radical. There is broad agreement that innovation should be present in all aspects of an organization and that it should be a mindset or a way of life. Innovation should permeate through the various elements of the organization's business model in order to make it harder to be copied by competitors. Therefore, innovation is not only measured by the new products or services offered by an enterprise but also by new and more efficient ways of developing, producing or delivering products or services.

INTRODUCTION

Innovation is the tool of entrepreneurship. In addition, both innovation and entrepreneurship demand creativity. Creativity is a process by which a symbolic domain in the culture is changed. New songs, new ideas, new machines are what creativity is about. Creativity is the ability to make or otherwise bring into existences something new, whether a new solution to a problem, a new method or device, or a new artistic object or form. Creativity as new and useful. Creativity is the act of seeing things that everyone around us sees while making connections that no one else has made. Creativity is moving from the known to the unknown. Culture exerts a negative force on creativity however, "were it not for creativity, culture itself would not be created."

No entrepreneur or enterprise, however successful and big, can continue to hold a place of leadership unless it recognizes that modern business operates in a world of galloping change which creates new problems, risk and opportunities and for which they have to mobilize the enterprise's resources before changes make their impact felt. To do successfully, the entrepreneur and enterprise should know where this firm is going and how the firm will get there. This is turn requires a clear definition of the company's business which will enable it to continually adopt operations to the realities of the market place, 'the very corner stone of survival and growth'

Innovation is defined as adding something new to an existing product or process. The key words are adding and existing. The product or process has already been created from scratch and has worked reasonably well. All innovation begins with creative ideas. Creativity is the starting point for innovation. Creativity is however necessary but not sufficient condition for innovation. Innovation is the implantation of creative inspiration.

CREATIVITY

Creativity is marked by the ability to create, bring into existence, to invent into a new form, to produce through imaginative skill, to make to bring into existence something new. Creativity is not ability to create out of nothing (only God can do that), but the ability to generate new ideas by combining, changing, or reapplying existing ideas. Some creative ideas are astonishing and brilliant, while others are just simple, good practical ideas that no one seems to have thought, of yet.

Creativity is also an attitude, the ability to accept change and newness, a willingness to play with ideas and possibilities, a flexibility of outlook, the habit of enjoying the good, while looking for ways to improve it, we are socialized into accepting only a small number of permissible or normal things, like chocolate-covered strawberries, for example. The creative person realizes that there are other possibilities like peanut butter and banana sandwiches, or chocolate-covered prunes.

Culture and the influences of culture have substantial impacts over almost all business activity. One of the most prevalent cultural influences is that of Hierarchy. With significant ties to old traditions, conventions and caste system many organizations operate within strict hierarchical systems. With many organizations adhering to such strict practices business can be slowed as employees may not conduct activities outside of what the typical role would be required to do. This can lead to projects that require menial tasks taking quite a bit of time if there are few lower level employees available to complete the tasks. This type of business and social interaction ties tightly to the roles within families to include extended family. In many situations there are a myriad of interrelationships that are founded based on regions of the country, family name, religion, city or state. The relationships can extend heavily into the workplace and can often time improve levels of trust between parties simply by where an individual is from or who his/her family is. In many cases Indians prefer to do business with those they know and respect. Often business relationships are only conducted following a long term personal relationship making it a good idea to allow introduction through a mutual third party.

POLITICAL BACKDROP

India is a parliamentary republic with a multi-party system of several recognized national parties including the Indian National Congress, the Bhartiya Janta Party (BJP) and nearly 40 regional parties. From a global perspective the Indian National Congress is considered to be somewhat liberal while the BJP is more conservative. However, it can be a debatable or sensitive issue for expatriates. During the period between 1950 and 1980 the majority of the parliament was led by the Indian National Congress. However since the late 80's much of the political climate is shared. Another fairly significant player is the National Democratic Alliance (NDA) who was the first non-Congress government to complete a full five-year term. Recently in 2009 the Indian National Congress reclaimed majority control forming the United Progressive Alliance (UPA).

INDUSTRIAL BACKDROP

India has been an independent country for several decades now and through that time much of its industrial climate has evolved. With fairly significant governmental control during the period between 1940 and 1970 the GDP grew 1.4% a year on average annually, and while this was not a terrible growth rate it was much lower than much of the world and was laggard by high levels of poverty and famine. The 1980's into the mid 1990's saw much more liberalization which resulted in historical growth in GNP in 1994. For example the output-growth hit an all time high of 8.4% and exports rose by 27% these combined led to a 10% drop in inflation during the mid 90's. As India moved into the 2000's, public sector expanded and exports continued to rise with a large contribution by private sector companies that contributed upwards of two-thirds of India's GDP since the government moved from a controller to an enabler of business. With this type of growth some experts expect India's world GDP to reach 11% by 2025 which would make it the third largest economy in the world behind the US and China.

MAJOR NON BPO INDUSTRIES IN INDIA

Textile Industry

This is a broad industry that covers everything from producing raw materials such as silk, cotton, and jute to creating readymade garments that can be distributed throughout the world. With over 35 million jobs in this industry and representing over 4% of the total GDP this is a very significant area of business.

Food Processing Industry

This is one of the potentially fastest growing industries in the country. While India accounts for only 1.5% of the global food business they are a significant food producing nation. With such capacity it is projected that this industry has the potential to generate over 37 million jobs by 2025.

Chemical Industry

Representing more than 16.2% of the nation's entire export business, Indian chemical manufacturing is a big business. Generating approximately 70,000 commercial goods a year it is regarded as one of oldest and largest big businesses with expansion into more and more commercial goods ranging from plastics to paints and beauty supplies. India is poised to move up from its current position as the 12th largest producer of chemicals in the world.

Cement Industry

With expansion occurring across the world the need for building material, specifically cement is increasing substantially. India has 10 large cement plants overseen by the different state governments. There are also 415 additional plants that are run by several companies in India; some of the largest being: Abuja cement, J K Cement, Aditay Cement and L&T Cement. Combined the cement companies in India have the capacity to produce nearly 160 million tons of cement per year.

Entrepreneurs take bold creative steps but situations encourage creativity. Creativity is, however, enhanced when people have some freedom, but not too much; high internal commitment to the task; but not too high a commitment; high proportion of intense rewards, but some extrinsic rewards as well; some competition but not winner take-all competition. Entrepreneurial activity depends on the process of innovation following creativity, not on creativity alone.

INNOVATION

Innovation is the process of bringing the best ideas into reality, which triggers a creative idea, which generates a series of innovative events. Innovation is the creation of new value. Innovation is the process that transforms new ideas into new value- turning an idea into value. You cannot innovate without creativity. Innovation is the process that combines ideas and knowledge into new value. Without innovation an enterprise and what it provides quickly become obsolete.

Innovation is fostered by information gathered from new connections; from insights gained by journeys into other disciplines or places; from active, collegial networks and fluid open boundaries. Innovation arises from organizing circles of exchange, where information is not just accumulated or stored, but created. Knowledge is generated a new from connections that were not there before. Innovation requires a fresh way of looking at things, an understanding of people, and an entrepreneurial willingness to take risks and to work hard. An idea doesn't Become an innovation until it is widely adopted and incorporated into people's daily lives. Most people resist change, so a key part of innovating is convincing other people that your idea is a good one – by enlisting their help, and, in doing so, by helping them see the usefulness of the idea- Art Fry.

Creative ideas are not enough for your business to survive. You need a process organization and culture that will help you maximize your creative assets. This is innovation capability that helps your pull together the best thinking within your business, enabling you to connect the organization dots.

Shapiro argues that perpetual and pervasive innovation is the key to long –term sustainable success in the relentless competition for customers. To survive any competition, you must rapidly and repeatedly re-invent yourself. The road map to reinvention starts by applying the seven R's.

1. Rethink your underlying assumptions.
2. Reconfigure how you carry out work.
3. Resequence when work takes place
4. Relocate where work is done to cut down on handoffs and delays.
5. Reduce the frequency of carrying our specific activities.
6. Reassign who does the work by asking if anyone else could achieve the same result more effectively and efficiently.
7. Retool the technology that supports getting the work done. Could new software and automated equipment transform our ways of working?

CREATIVITY AND INNOVATION IN AN ENTREPRENEURIAL ORGANIZATION

Growth and development cannot be sustained without additional innovations (usually in the product or services or in its marketing) with additional innovations, firms become “glamorous” Introducing new products is usually seen as part of the process of innovation, which is itself seen as the engine driving continued growth and development.

The “winning performance” of the entrepreneur and the organization focuses on.

- Competing on quality not prices;
- Domination of a market niche;
- Competing in an area of strength
- Having tight financial and operating controls: while successful businesses will each employ their own strategy, they achieve complete advantage through acts of innovation. Learning and problem-solving are common activities in many working environments today, but some people believe that true entrepreneurship occurs when individuals ignore the established ways of thinking and acting and seek novel ideas and solutions that can meet customers' needs Entrepreneurship is, therefore, the innovatory process involved in the creation of an economic enterprise based on a new product or service which differs significantly from products or services offered by other suppliers in content or in the way its production is organized nor in its marketing.

It has been argued that small businesses have a greater proclivity to innovate than their large counterparts and are, therefore, crucial in helping a country respond to myriad changes in the economic, technological and social environment.

For instance, the OECD points out that small firms are innovative in different ways and are especially active in developing new' approaches to management and marketing. To grow and prosper, most enterprises need to constantly improve their existing products and services through continuously innovating needed changes: and for survival of the enterprise, must also need to create new products and services to meet yet unfulfilled needs. Enterprises that rely exclusively on innovation will prosper until their products and services “ran out of gases and become obsolete and non-

competitive. On the other hand, enterprise that are totally creative will have their new products and services ready to launch, but often too few current products sufficiently up-to-date and competitive to generate the cash needed to fund their creativity.

Changes are that the very successful leaders of the future will be more likely to make creativity and innovation a strategic priority in their organization. In today's environment where competition requires business enterprises to be distinct and meet customer needs with better or never products and organization becomes in critical necessity Joseph Schumpeter views innovation as the source of success in the market economy, a view that is reinforced by today's changing and competitive environment. The organization that is not creative and innovative cannot survive in the market place. Thus, entrepreneurs and enterprises are continuously creative and innovative to remain relevant to the customers, which is the purpose of every business.

CONCLUSION

Successful entrepreneurs require an edge derived from some combination of a creative idea and a superior capacity for execution. The entrepreneur's creativity may involve an innovation product or a process that changes the existing order. Or entrepreneur may have a unique insight about the course or consequence of an external change. Entrepreneurship is the vehicle that drives creativity and innovation. Innovation creates new demand and entrepreneurship brings the innovation to the market. Innovation is the successful development of competitive edge and as such, is the key to entrepreneurship.

Creativity and Innovation are at the heart of the spirit of enterprise. It means striving to perform activities differently or to perform different activities to enable the entrepreneur deliver a unique mix of value. Thus the value of creativity and innovation is to provide a gateway for astute entrepreneurship—actively searching for opportunities to do new things, to do existing things in extraordinary ways. Creativity and Innovation therefore, trigger and propel first-rate entrepreneurship in steering organization activities in whatever new directions are dictated by market conditions and customer preferences, thereby delighting the customers to the benefit of the stakeholders. Innovation also means anticipating the needs of the market, offering additional quality or services, organization efficiently, mastering details, and keeping cost under control.

No doubt, the current economic environment is a volatile and violent one. The new environment demands renewed dynamism of approach. Creativity and innovation is the new name of the game. Only the discerning organizations can manage the changes inherent in the new environment. It is the duty of the entrepreneur to keep his/her organization lean, young, flexible, and eager for new things to continuously delight the customers, which is the purpose of every business.

REFERENCES

- [1] Amabile, T.M., (1998), "How to Kill Creativity," *Harvard Business Review*, Sept-Oct.
- [2] Bhide, A., (1994), "How Entrepreneurs Craft Strategies That Work," *Harvard Business Review*, Mar-Apr.
- [3] Bridges, S., O'Neill, K. and Cromie, S., (2003), *Understanding Enterprises: Entrepreneurship and Small Business*, New York: Palgrave Macmillan.
- [4] Chakravorti, B., (2004), "The New Rules for Bringing Innovations to Markets," *Harvard Business Review*, March.
- [5] Drucker, P.F., (1985), *Innovation and Entrepreneurship*, London: Pan Books Ltd.
- [6] Drucker, P.F., (2002), *Management Challenges for the 21st Century*, London: Butterworth Heinemann.
- [7] Harris, R., (1998), "Introduction to Creative Thinking," data retrieved from <www.vitualsalt.com>.
- [8] Sikszen, M.C., (1997), *Creativity: Flow and the Psychology of Discovery and Invention*, New York: Harper Will Collins Publishers, Inc.
- [9] Okpara, F.O., (2000), *Entrepreneurship: Text and Cases*, Enugu: Precision Printers And Publishers.
- [10] Drucker, P.F., (1995), *Management in a Time of Great Change*, Oxford: Butterworth Heinemann.
- [11] Meredith, G.G., Nelson, R. E. and Neck, R. A., (1991), *The Practice of Entrepreneurship*, Lagos: University Press.
- [12] Okpara, F.O., (2006), *The Practice Of Entrepreneurship*, Enugu: Precision Publishers Ltd.
- [13] Thompson, J.L., (2001), *Strategic Management*, Canada: Thomson Learning.
- [14] Schumpeter, J.A., (1934), *The Theory of Economic Development*, Cambridge, USA: Harvard University Press.
- [15] Porter, M.E., (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*. USA: Free Press.

Foreign Direct Investment in India with Reference to Manufacturing Industries

Sacheen S. Aloney¹ and S.H. Indurwade²

¹Om College of Engineering, Wardha (MS)

²HOD, Department of Economics, R.T.M. Nagpur University, Nagpur

Abstract— FDI plays a multidimensional role in the overall development of host economies. It is widely discussed in the literature that, besides capital flows, FDI generates considerable benefits. There have been significant changes in the growth models of developing economies during the past two decades. In India, FDI equity flows are concentrated in a few state. Of the total approved FDI flow, Maharashtra accounted for the largest proportion with 46 per cent, followed by Gujarat with 15 per cent, and Delhi with 7.7 per cent. India is ranked second in the world in terms of manufacturing capability, according to the "2010 Global Manufacturing Competitiveness Index" by Deloitte Touche Tohmatsu and the US Council on Competitiveness. Approximately 50 sectors in India's domestic manufacturing sector grew by 39 percent during the April - December 2010 period, achieving the "excellent growth" category. Indian manufacturing sector has been averaging 9 per cent growth in the past four years (2004-08), with a record 12.3 per cent in 2006-07

Keywords: FDI, Manufacturing Industries

FDI plays a multidimensional role in the overall development of host economies. It is widely discussed in the literature that, besides capital flows, FDI generates considerable benefits. These include employment generation, the acquisition of new technology and knowledge, human capital development, contribution to international trade integration, creation of a more competitive business environment and enhanced local/domestic enterprise development, flows of ideas and global best practice standards and increased tax revenues from corporate profits generated by FDI. There have been significant changes in the growth models of developing economies during the past two decades. Many of these economies, including India, have moved away from inward- oriented import substitution policies to outward-oriented and market-determined export- oriented strategies.

The country-wise share of foreign direct investment in India from 2006-2010. The data relevant to the analysis is presented in Table 1.

Table 1: Country-Wise FDI Inflows Top 10 Countries (From 2007–2010) (Amount Rupees in Corers)

Rank	Country	2007-08	2008-09	2009-10	Cumulative Inflows (April '00 to April '10)	% Age to Total Inflows
1	Mauritius	44483	50794	49633	213434	43
2	Singapore	12319	15727	11295	47080	9
3	USA	4377	8002	9230	37593	7
4	UK	4690	3840	3094	26263	5
5	Netherlands	2780	3922	4283	20438	4
6	Japan	3336	1889	5670	18350	4
7	Cyprus	3385	5983	7728	17900	4
8	Germany	2075	2750	2980	12571	3
9	France	583	2098	1437	7102	1
10	UAE	1039	1133	3017	7054	1
	Total FDI Inflows	98664	123025	123378	526357	83%

Source: Government of India (GOI) (2009). FDI Statistics, Ministry of Commerce & Industry, Department of Industrial Policy and Promotion

India's 83% of cumulative FDI is contributed by nine countries while remaining 17 per cent by rest of the world. The analysis of country wise inflows of FDI in India indicates that during 2007-2010, the total amount of Rs 526537 of FDI was received from 113 countries including NRI investments.

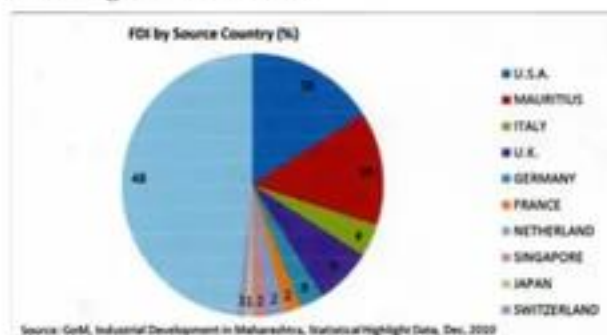


Fig. 1

India's perception abroad has been changing steadily over the years. This is reflected in the ever growing list of countries that are showing interest to invest in India. Mauritius emerged as the most dominant source of FDI contributing 44 % of the total investment in the country. Singapore was the second dominant source of FDI inflows with 9% of the total inflows. However, USA slipped to third position by contributing 7% of the total inflows. They maintained continuous increasing trend under the period of study. UK occupied fourth position with 5% followed by Netherlands with 4%, Japan with 4%, Cyprus with 4%, Germany with 3%, France with 1%, UAE with 1%.

TRENDS IN FDI INFLOWS INTO INDIA

FDI inflows grew steadily through the first half of the 90s but stagnated between 1996-97 and 2003-04 (Table 2.1). The year-on-year fluctuations until 2003-04 make it difficult to identify a clear trend; however, inflows have been increasing continuously since 2004-05. During 2008-09, India registered FDI inflows of \$33.6 billion and total cumulative inflows from August 1991 to March 2009 have been to the tune of \$155 billion.

Table 2: FDI Inflows in India 1991–2009

Year	Amount of FDI Inflows		Annual Growth
	Rs. Crore	US\$ Million	\$ Value
1991-92	375	129	
1992-93	1051	315	144.2
1993-94	2041	586	86
1994-95	4241	1314	124.2
1995-96	7317	2144	63.2
1996-97	10170	2821	31.6
1997-98	13317	3557	26.1
1998-99	10550	2462	-30.8
1999-00	9409	2155	-12.5
2000-01	18404	4029	87
20 01-02	29269	6130	52.1
20 02-03	24681	5035	-17.9
20 03-04	19830	4322	-14.2
20 04-05	27234	6051	40
200 5-06	39730	8961	48.1
20 06-07	103037	22826	154.7
2007-08	137935	34362	50.5
2008-09	159354	33613	-2.2
August 1991 – March 2000	58471	15483	
April 2000 – March, 2009	559474	125329	
August 1991 – March 2009	617945	140812	

Source: Secretariat for Industrial Assistance, various FDI Fact Sheets.

Note: + RBI has included the amount of US\$ 92 million for the month of April 2007.

In India, FDI equity flows are concentrated in a few state. Of the total approved FDI flow, Maharashtra accounted for the largest proportion with 46 per cent, followed by Gujarat with 15 per cent, and Delhi with 7.7 per cent. Other states with significant and large investments were Andhra Pradesh, Karnataka and Tamil Nadu. Among these states, only a few cities were involved in a significant amount of FDI.

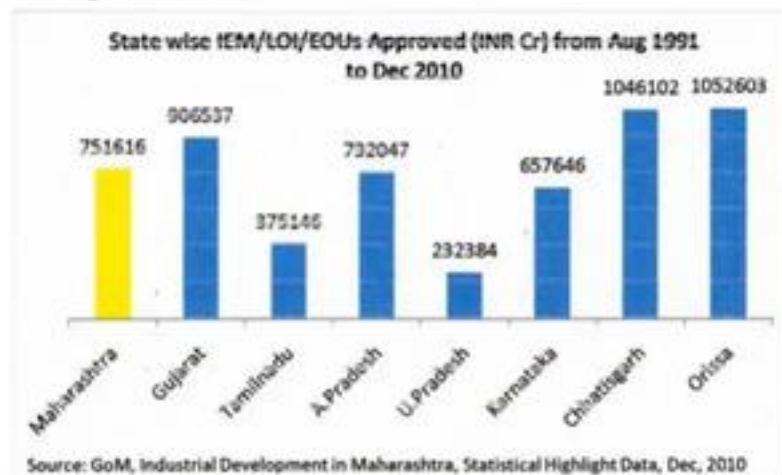


Fig. 2

FDI Inflows in India-Sectoral Analysis of Top 10 Sectors Sector-wise FDI Inflows in India from April 2010-Dec 2010

Table 3: Sector-Wise FDI Inflows (Rupees in Crores)

Sector	2007-08	2008-09	2009-10	Cumulative Inflows (April '00-April '10)	% Age to Total Inflows (In Terms of US\$)
Services Sector (financial & non-financial)	26,589	28,411	20,958	106,992	21 %
Computer Software & Hardware	5,623	7,329	4,350	44,611	9 %
Telecommunications (radio paging, cellular mobile, basic telephone services)	5,103	11,727	12,338	42,620	8 %
Housing & Real Estate	8,749	12,621	13,586	37,615	7 %
Construction Activities (including roads & highways)	6,989	8,792	13,544	36,066	7 %
Power	3,875	4,382	6,908	21,466	4 %
Automobile Industry	2,697	5,212	5,609	20,864	4 %
Metallurgical Industries	4,686	4,157	1,935	13,845	3 %
Petroleum & Natural Gas	5,729	1,931	1,328	12,026	2 %
Chemicals (other than fertilizers)	920	3,427	1,707	11,390	2 %

There are wide variations in the FDI inflow across the states of India. Only seven states accounted for over 97 per cent of the total amount of export-oriented FDI and 83 per cent of total FDI approvals during 1991-2001. The presence of Export Processing Zones was found to be a relevant pull factor in attracting export-oriented FDI. Further, while explaining the sensitivity of FDI to labour market conditions, the study revealed that labour market rigidities and labour costs are more pronounced for export-oriented FDI than for domestic market-seeking FDI. Infrastructure and regional development are found to be key factors in attracting higher FDI, both in the export and domestic market-seeking sectors.

FDI INFLOWS IN MANUFACTURING

India is ranked second in the world in terms of manufacturing capability, according to the "2010 Global Manufacturing Competitiveness Index"™ by Deloitte Touche Tohmatsu and the US Council on Competitiveness. India's workforce of scientists, researchers, and engineers, together with its English-speaking workforce and democratic regime, the report says, make it an attractive destination for manufacturers. In 2010, the indicator of the overall condition of the manufacturing sector has moved up to 126.5 for the appraisal quarter, its highest reading since the April-June 2007 quarter. In the last quarter of the year, the manufacturing industry showed positive results despite less than impressive performance in other sectors.

GROWTH IN INDIA'S MANUFACTURING SECTOR

Approximately 50 sectors in India's domestic manufacturing sector grew by 39 percent during the April – December 2010 period, achieving the "excellent growth" category. These segments are air conditioners, natural gas, tractors, nitrogen fertilizers, ball bearings, electrical and cable wires, auto components, construction equipment, electric fans and the tire industry. Twenty-two segments entered the "high growth" group, registering a growth of 17.3 percent during the first nine months of the existing fiscal. Industries such as utility vehicles, crude oil, power transformers, energy meters, alcoholic beverages and textile machinery have registered around 10-20 percent growth.

India is quickly rising as a worldwide manufacturing hub with a huge number of companies changing their manufacturing base to the country. Furthermore, India has the largest number of companies, outside of Japan, that have been recognized for excellence in quality.

The manufacturing sector plays a significant role in the Indian economy, contributing nearly 17 per cent to the GDP (in 2008-09). Encouraged by the increasing presence of multinationals, the scaling up of operations by domestic companies and an ever-expanding domestic market, the Indian manufacturing sector has been averaging 9 per cent growth in the past four years (2004-08), with a record 12.3 per cent in 2006-07. Industry and manufacturing were the major contributors to the economy, having a consistently high GDP growth rate in the past two years, making India one of the fastest growing economies in the world. India has all the requisite skills in product, process and capital engineering, due to its long manufacturing history and higher education system. India's cheap, skilled manpower is attracting a number of companies across diverse industries, making India a global manufacturing powerhouse. FDI inflows into manufacturing have been computed based on FDI records provided by DIPP.

The share of FDI inflows in the manufacturing sector was as follows: electrical equipment (including s/w & elec.) occupied the highest share, i.e., 30.6 per cent during 2000-2007, followed by the transportation industry (9.9 per cent), fuels (power & oil refinery) (7.7 per cent), chemicals (other than fertilisers) (4.8 per cent) and drugs and pharmaceuticals (4.0). The remaining sectors have a share of less than 4 per cent in total FDI inflows in manufacturing.

However, the share of manufacturing in total FDI inflows of India was 34.02 per cent in 2007. State-wise Distribution of FDI

The state-wise trends in FDI show that the RBI's regional offices at Maharashtra, New Delhi, Karnataka, Tamil Nadu and Gujarat have been the largest recipients of FDI in terms of cumulative FDI inflows. These states are either known for

their strong industrial base (like Gujarat) or as software hubs (like Karnataka and Delhi). This could also be attributed to their better resources, infrastructure like roads and power, investor-friendly policies like single-window clearances and investment promotion schemes like special economic zones. However, the competition among the states to promote their own state in attracting FDI has led to an increasing trend in FDI in other states.

Table 4: Ranking of Sector Wise FDI Inflows in India Since April 2000-Dec 2010

Industrial Sector	Rank
Service Sector	1
Computer Hardware & Software	2
Telecommunication	3
Housing and Real Estate	4
Construction Activities	5
Power	6
Automobile Industry	7
Metallurgical Industry	8
Petroleum and Natural Gas	9
Chemicals	10

Source: Fact Sheets on FDI, DIPP

The Sector wise Analysis of FDI Inflow in India reveals that maximum FDI has taken place in the service sector including the telecommunication, information technology, travel and many others. The service sector is followed by the computer hardware and software in terms of FDI. High volumes of FDI take place in telecommunication, real estate, construction, power, automobiles, etc.

The rapid development of the telecommunication sector was due to the FDI inflows in form of international players entering the market and transfer of advanced technologies. The telecom industry is one of the fastest growing industries in India. With a growth rate of 45%, Indian telecom industry has the highest growth rate in the world.

FDI inflows to real estate sector in India have developed the sector. The increased flow of foreign direct investment in the real estate sector in India has helped in the growth, development, and expansion of the sector. FDI Inflows to Construction Activities has led to a phenomenal growth in the economic life of the country. India has become one of the most prime destinations in terms of construction activities as well as real estate investment.

The FDI in Automobile Industry has experienced huge growth in the past few years. The increase in the demand for cars and other vehicles is powered by the increase in the levels of disposable income in India. The options have increased with quality products from foreign car manufacturers. The introduction of tailor made finance schemes, easy repayment schemes has also helped the growth of the automobile sector. The basic advantages provided by India in the automobile sector include, advanced technology, cost-effectiveness, and efficient manpower. Besides, India has a well-developed and competent Auto Ancillary Industry along with automobile testing and R&D centres. The automobile sector in India ranks third in manufacturing three wheelers and second in manufacturing of two wheelers. Opportunities of FDI in the Automobile Sector in India exist in establishing Engineering Centres, Two Wheeler Segment, Exports, Establishing Research and Development Centres, Heavy truck Segment, Passenger Car Segment.

The increased FDI Inflows to Metallurgical Industries in India has helped to bring in the latest technology to the industries. Further the increased FDI Inflows to Metallurgical Industries in India has led to the development, expansion, and growth of the industries. All this has helped in improving the quality of the products of the metallurgical industries in India.

The increased FDI Inflows to Chemicals industry in India has helped in the growth and development of the sector. The increased flow of foreign direct investment in the chemicals industry in India has helped in the development, expansion, and growth of the industry. This in its turn has led to the improvement of the quality of the products from the industry.

Based upon the data given by department of Industrial Policy and Promotion, in India there are sixty two (62) sectors in which FDI inflows are seen but it is found that top ten sectors attract almost seventy percent (70%) of FDI inflows. The cumulative FDI inflows from the above results reveals that service sector in India attracts the maximum FDI inflows amounting to Rs. 106992 crores, followed by Computer Software and Hardware amounting to Rs. 44611 crores. These two sectors collectively attract more than thirty percent (30%) of the total FDI inflows in India. The housing and real estate sector and the construction industry are among the new sectors attracting huge FDI inflows that come under top ten sectors attracting maximum FDI inflows.

Thus the sector wise inflows of FDI in India shows a varying trend but acts as a catalyst for growth, quality maintenance and development of Indian Industries to a greater and larger extend. The technology transfer is also seen as one of the major change apart from increase in operational efficiency, managerial efficiency, employment opportunities and infrastructure development.

FDI in the primary sector tends to have a negative impact on growth, while investment in manufacturing has a positive effect, and the impact of FDI in services is ambiguous. In general, multinational enterprises have increasingly contributed to capacity addition and total sales of manufacturing. Further, FDI plays an important role in raising productivity growth in sectors in which investment has taken place. In fact, sectors with a higher presence of foreign firms have lower dispersion of productivity among firms, thus indicating that the spill-over effects had helped local firms to attain higher levels of productivity growth. Besides being an important source for diffusion of technology and new ideas, FDI plays more of a complementary role than of substitution for domestic investment. FDI tends to expand the local market, attracting large domestic private investment. This "crowding in" effect creates additional employment in the economy. Further, FDI has a strong relation with increased exports from host countries. FDI also tends to improve the productive efficiency of resource allocation by facilitating the transfer of resources across different sectors of the economy.

India's labour-intensive manufacturing can potentially absorb a major section of the labour force and it holds the key to achieve dynamic growth in the country. High-tech industries are not attracting efficiency-seeking FDI; medium- and low-tech industries with foreign stakes seem to have performed better, indicating that India's comparative advantage in exports lies with low-tech industries. However, in the information technology sector, exports by MNE affiliates are greater when they have larger foreign equity stakes.

REFERENCES

- [1] Assocham Eco Pulse Study, Annual FDI Report, 2008-09, Assocham Research Bureau
- [2] FDI in India and its Growth Linkages, 2009, National Council Of Applied Economic Research, Sponsored By Department Of Industrial Policy & Promotion (Ministry Of Commerce & Industry, Government Of India)
- [3] Attracting Foreign Direct Investment (FDI) to India Ramkishan S. Rajana, Sunil Rongalab and Ramya Ghosh George Mason University, Virginia, International Professional Services Organization, Hyderabad, India and Claremont Graduate University, California, USA.
- [4] Peter Nunnenkamp and Rudi Stracke 2007 Foreign Direct Investment in Post-Reform India: Likely to Work Wonders for Regional Development? Kiel Working Paper No. 1375.

य क र ए eat ul क ; d h d k eg Ro

ea qoeK v k j k ho oek

¹ लोकतंत्र अतिरिक्त लोकतंत्र, एकात्मिक लोकतंत्र और लोकतंत्र, भारत।
² लोक, लोकतंत्र और लोकतंत्र लोकतंत्र लोकतंत्र लोकतंत्र, भारत।

मानव जीवन का आरम्भ संख्या से होता है और उसका अंत भी संख्या से ही होता है। जीवन के हर क्षेत्र में लाभ-हानि की घर्षा होती है, किंतु लाभ हुआ, कितनी हानि हुई, आदि समस्याएँ प्रत्येक व्यक्ति के समक्ष विद्यमान रहती हैं। किसी भी प्रकार की गणना हो, उसका निश्चित स्वरूप होता है और उसी के अनुसार गणना की जाती है।

सांख्यिकी शब्द की उत्पत्ति लैटिन के स्टैटस (जंजने) शब्द से हुई जिसका अर्थ राजनीतिक स्थिति, अर्थात् राज्य की स्थिति की जानकारी, जिस गणना से होती है वह जनसांख्यिकी कहलाती है। राज्य की गणना, आय तथा व्यय के विभिन्न स्रोतों का ज्ञान सांख्यिकी के द्वारा ही प्राप्त होता है। यदि हम वातावरण तथा समाज के संगठित कारकों को विभूखलित होने से बचना चाहते हैं, व्यक्ति का विकास चाहते हैं, समान रूप से सुदृढ़ नियमों से प्रभावित सामाजिक रीतियों, सार्वजनिक स्वास्थ्य, आर्थिक स्थिति, सुरक्षा तथा कल्याण का पता लगाना चाहते हैं तो हमें सांख्यिकी का सहारा लेना होगा। लोकतंत्र के क्षेत्र में यह जनसांख्यिकी कहलाती है। जन सांख्यिकी पूर्व निश्चित उद्देश्य से सम्बंधित निष्पक्ष और विधिवत ढंग से जुटाए गए तथ्यों का एकत्रीकरण, प्रस्तुतीकरण और उनका विश्लेषण करना है।

जन सांख्यिकी में मानव जनसंख्या का सांख्यिकीय अध्ययन होता है। यह वह विज्ञान है जिसे किसी भी तरह की गतिशील मानव आबादी पर लागू किया जा सकता है। जो आबादी समय और स्थान के साथ-साथ परिवर्तित होती है, जनसंख्या के आकार, संरचना और वितरण तथा जन्म प्रवास, वय वृद्धि और मृत्यु के संदर्भ में जो अध्ययन किया जाता है वह जनसांख्यिकी के अंतर्गत आता है।

जनसांख्यिकी विश्लेषण को शिक्षा, राष्ट्रीयता, धर्म और जातीयता जैसे मानदण्डों के आधार पर विभाजित कर पूरे समाज या समूह पर लागू किया जा सकता है। शिक्षण क्षेत्र में जनसांख्यिकी को अक्सर समाजशास्त्र, अर्थशास्त्र अथवा मानव-विज्ञान की एक शाखा के रूप में माना जाता है। औपचारिक जनसांख्यिकी के अध्ययन का लक्ष्य, जनसंख्या की प्रक्रियाओं के मापन तक सीमित है जबकि सामाजिक जनसांख्यिकी-जनसंख्या अध्ययन का अधिक व्यापक क्षेत्र, जनसंख्या को प्रभावित करने वाले आर्थिक, सामाजिक, सांस्कृतिक और जैविक प्रक्रियाओं के बीच सम्बन्धों का विश्लेषण करता है। जनसांख्यिकी शब्द का प्रायः चलती से जनसांख्यिकी के लिए इस्तेमाल कर लिया जाता है, लेकिन यह किसी जनसमुदाय की विशेषताओं को निर्दिष्ट करता है जिसका प्रयोग सरकारी व्यापार या अभिमत अनुसंधान में चाहेसे अनुसंधानों में प्रयोग होता है।

ऑकड़ेकत्रित करने के दो तरीके हैं : प्रत्यक्ष और अप्रत्यक्ष। प्रत्यक्ष ऑकड़े महत्वपूर्ण पंजीकृत ऑकड़ों से प्राप्त होते हैं। यह कानूनी स्थिति में कुछ परिवर्तन भी चाहते हैं। एक अन्य प्रत्यक्ष विधि है- जनगणना।

जनगणना में लोगों की निश्चि गिनती के अलावा भी काफी कुछ होता है। आमतौर पर परिवारों में या घरों के बारे में जानकारी इकट्ठा करने के साथ-साथ, व्यक्तिगत विशेषताओं से सम्बंधित भी जानकारीएकत्रित करते हैं। वे धर्म, भाषा, राष्ट्रीयता या जातीयता और नागरिकता के ऑकड़े भीएकत्रित कर सकते हैं।

ऑकड़ेकत्र करने के अप्रत्यक्ष तरीके में यह चीजें आती हैं जहाँ ऑकड़े उपलब्ध नहीं होते हैं। जहाँ सर्वेक्षण के शोधकर्ता प्रत्यक्ष रूप से जनसंख्या के लिए अनुमान लगाते हैं। सामाजिक संगठन का आर्थिक विश्लेषण करने के कारण समूह गतिशीलता की उत्पत्ति हुई। इसी ने राज्य संघार और इतिहास में प्रचार की भूमिका के अवलोकन के लिए भीय रखी। *सेन्सुस गैंग्लेटर* ने अधिक परिष्कृत और व्यवस्थापकीय मॉडलों को प्रस्तुत किया। इस जनसांख्यिकी में ही सामाजिक सर्वेक्षण, संगठन आदि भी सम्मिलित हैं। इसमें समुदाय तथा जनता के लिए स्थिरता और वैश्विक बदलाव के मानवीय अद्ययन का अध्ययन भी किया जाता है। हाल में हुए परिवर्तन, समाज, साहित्यदर्शन आदि सभी का अवलोकन हम जनसांख्यिकी द्वारा भी कर सकते हैं। ऑकड़ों से पता चलता है कि बीते छः दशकों में जो परिवर्तन आया है जिससे अमीरी और गरीबी के बीच खाई घटने की बजाय बड़ी है, जातिगत भेदभाव और उत्पीड़न खत्म नहीं हुआ बड़ा है। बची-खुची कसर जाति-जनगणना ने पूरी कर दी है। चुनावी में सतबोर उत्तर-प्रदेश में यह सबसे अधिक देखी जा सकती है। सारे राजनीतिक दलों ने पूरे सूबे को जातियों में बाँट दिया है। देश के कुपोषण सम्बन्धी ऑकड़ों से पता चलता है कि 42 बच्चे आज भी कुपोषण के शिकार हैं। यही स्थिति शिक्षा के क्षेत्र में भी व्याप्त है। शिक्षा की ताजा रिपोर्ट निराशाजनक है वहाँ भी स्तर गिरा है। यह सब जानकारी हमें जनगणना के द्वारा ही प्राप्त होती है। लोगों में यह धारणा बन गई है कि अगर आपको अपनी बात मनवानी है तो अपनी संख्या बढ़ाओ। पूरे देश में सालभर के दौरान जो माहौल बना उससे यही लगता है कि संख्या बल के आधार पर ही अच्छे और बुरे का मूल्यांकन किया जाए। मृत्यों और सिद्धांतों की उपेक्षा में बहुसंख्यक जनता विस रही है।

YK SR-

लोकतंत्र-लोगों का शासन, जनता का शासन अर्थात्एकैसी शासन व्यवस्था, जिसमें जनता अपना शासक स्वयं चुनती है। लोकतान्त्रिक व्यवस्था और लोकतान्त्रिक राज्य दोनों के लिए यह शब्द प्रयुक्त होता है। जब जनता द्वारा, जनता के लिए, जनता का शासन बनाया जाता है तब विभिन्न परिस्थितियों में अलग-अलग धारणाओं के प्रयोग से इसकी अन्वयार्ण कुछ जटिल हो जाती है। प्राइस महोदय ने इसे सरल शब्दों इस प्रकार बताया है-“लोकतंत्र शासन का वह प्रकार है जिसमें राज्य के शासन की शक्ति किसी विशेष वर्ग या वर्गों में निहित न होकर सम्पूर्ण जनसमुदाय में निहित है।”

कल्लि & कल्लि मेकडें न् vol .1½

डॉ० केनीप्रसाद ने कहा है-“यह जीवन का एक ढंग है। इस मान्यता पर आधारित है कि प्रत्येक व्यक्ति के सुख का महत्व उतना ही है जितना कि अन्य किसी के सुख का महत्व हो सकता है तथा किसी को भी अन्य किसी के सुख का साधन मात्र नहीं समझा जा सकता।”

कल्लि कल्लि न्, चह हव कल्लि फि फोडि ½

हमारा देश दुनिया का सबसे बड़ा लोकतंत्र है। लोकतंत्र के तहत जो राजनीतिक व्यवस्था लागू है अब उसकी विसंगतियाँ भयावह रूप से सामने आने लगी हैं। 62 वर्ष के इस लम्बे गणतंत्र में कुछ सकारात्मक बातें हैं तो कुछ नकारात्मक भी हैं। सकारात्मक बात यह है कि इस दौरान हमारा सविज्ञान अधुण्य रहा है। देश में लोकतंत्र मजबूत हुआ है। जनता का विश्वास लोकतंत्र में बना हुआ है हमारे कोट की कीमत बहुमूल्य है। हमारा देश ही विश्व के सबसे बड़े और मजबूत लोकतंत्र का उदाहरण है। हमारीएकता को तोड़ने की नाकाम कोशिशें होती रही हैं फिर भी पूरा भारतएक है। आज विकसलाओं की भीएक लम्बी सूची हमारे सामने है। जनसांख्यिकी की गणना के द्वारा पता चलता है कि आजादी के समय गरीबों की संख्या जितनी थी, ऑकड़ों से यह ज्ञात होता है कि उससे अधिक लोग गरीबी की हालत में अब हैं। हमारे प्रधानमंत्री जी भी यह स्वीकार करते हैं कि 42 प्रतिशत बच्चे कुपोषण का शिकार हैं। निरक्षरों की संख्या घटने के बजाय बढ़ती ही जा रही है। सरकार कितने भी सर्वशिक्षा अभियान चलाये उसके प्रयास असफल ही हो रहे हैं। इन 62 वर्षों में भी हम गरीबी और अमीरी की खाई को नहीं बंद कर सके। निरक्षरों की संख्या भी बड़ी। आर्थिक विकास कुछ ही लोगों का हुआ है। कर्मकाजी व्यक्तियों की संख्या में तो वृद्धि हुई है लेकिन संस्थानों की कमी है।

भ्रष्टाचार का जैसा विकराल रूप एक साल के अंदर देखने को मिला है उसकी कल्पना शायद ही किसी ने की थी। इसका एक कारण यही लगता है कि लोकतन्त्र तो लागू हुआ, लेकिन लोकतांत्रिक व्यवस्था के तीनों अंगों—विधायिका, कार्यपालिका और न्याय पालिका ने अपनी जिम्मेदारी को सही ढंग से नहीं निभाया। आज लोकतन्त्र का कोई भी अंग पारदर्शी नहीं है।

कानून सबके लिए बराबर होने की बात किताबों और भाषणों में ही रह गयी है। आज लोकतन्त्र का यह हाल है कि बड़ा आदमी जुर्म करके भी छूट जाता है। गवाह खरीद लिए जाते हैं। फाइलों से दस्तावेज गायब हो जाते हैं। लोकतन्त्र की सबसे बड़ी असफलता यह भी है कि भारत का पैसा भ्रष्ट लोगों ने ही चुराकर विदेशों में जमा किया है। रिवस बैंकों में जितना पैसा भारतीयों का है उतना किसी देश का नहीं है। पूरे देश के बजट से ज्यादा पैसा विदेशी बैंकों में फंसा होने पर भी सरकार कुछ भी कर सकने में असमर्थ है। देश की राजधानी अपराध की राजधानी में बदलती जा रही है।

आज शिक्षित युवा—वर्ग निराश है। उन्हें दिशा देने वाला न कोई दर्शन है न कोई सिद्धांत। मूल्यों के गिरते स्तर के कारण युवा—पीढ़ी गलत दिशा की ओर चलाने कर रही है। लोकतन्त्र के सारे स्तम्भ—धूसर, घोटालों, फसावत, धोरी आदि से भरे पड़े हैं। मीडिया भी इससे अछूता नहीं है। वर्तमान लोकतन्त्र में किसी भी बड़े अधिकारी को उसके जुर्म की सजा देना असम्भव था लेकिन श्री अन्ना हजारे जी के भ्रष्टाचार—विरोधी आंदोलन से प्रेरित होकर यह संभव सा प्रतीत होने लगा है। आरूबी—हेमराज हत्याकाण्ड हो या घर्षित मिठारी काण्ड, राठौर जैसे दैत्यों के कारनामों हो, 2जी घोटाला, कॉमनवेल्थ घोटाला, उत्तर—प्रदेश का स्वास्थ्य मिशन घोटाला आदि ने देश की छवि को गहरा धक्का पहुँचाया है। यह इसलिए हुआ, क्योंकि जिन लोगों पर इसकी सबसे अधिक जिम्मेदारी थी उन्होंने अपने कर्तव्य का पालन तथा जिम्मेदारी का निर्वाह ईमानदारी से नहीं किया। भ्रष्टाचार के इस आंदोलन में जो फकड़—धक्कड़ तेज हुई और सालभर के दौरान जो माहौल बना, जनता के जागरूक होने से यही लगता है कि हमारा लोकतन्त्र परिपक्व अवस्था में पहुँच चुका है।

लेकिन हमें दुःख तब होता जब हमारा उदार लोकतन्त्र एक लेखक की सुखा करने में अपनी असमर्थता दिखाता है। जयपुर साहित्य महोत्सव में मशहूर लेखक सलमान रस्टी का नहीं आने दिया गया। इस कृत्य से हमें आघात पहुँचा है। नागरिक आजादी की पुर्खा देने वाला उदार तथा विविधता वाला देश भारत एक निहत्थे लेखक को सुखा प्रदान करने में असमर्थ रहा। यह कौन सी ताकतों थीं जिनके समक्ष हम लाघर और कमजोर हो गए। स्वातंत्र रूप से बोलने और लिखने की आजादी क्यों छीन ली गयी। यह हमारा दुर्भाग्य ही है।

आज 21वीं शताब्दी में होकर भी हम 19वीं शताब्दी के बनाए नियमों और कानूनों को ही अपनाते आ रहे हैं। इन नियमों और कानूनों में परिवर्तन और संशोधन की आवश्यकता हमारे मुख्य न्यायाधीश जस्टिस वीएनरावरे तथा अन्य कानूनविदों ने भी महसूस की है। उनका कहना है कि समाज में बदलाव के साथ ही कानून में भी संशोधन जरूरी है।

समाजमूलक समाज का जो खंडित रूप आज हमारे सामने आ रहा है उसका कारण यही लगता है कि हमने याददा तो किया था समाज के प्रायःक स्तर के व्यक्तियों को साथ लेकर चलने का लेकिन इन पर कायम नहीं रह पाये। हमारी अनेक समस्याएँ तो इस गैरबराबरी के कारण ही उत्पन्न हुई हैं। सर्वे के अनुसार वर्तमान शासन—व्यवस्था से कोई भी खुश नहीं है। सरकारी योजनाओं का लाभ जरूरतमंद व्यक्तियों तक नहीं पहुँच पाता है। आज आम व्यक्ति खुद को असहाय पा रहा है। चाहे वह मंहगाई का हमला हो या आतंकवाद का या अलगाववाद का—इसके निशाने पर आम आदमी ही है।

निष्कर्ष रूप में यही कहा जा सकता है कि लोकतन्त्र स्वच्छ रूप में तभी विकसित हो सकता है जब सर्वे तथा आँकड़ों के आधार पर इसका मूल्यांकन समय—समय पर किया जाए। सर्वे के द्वारा ही किसी भी योजना तथा कार्य की सफलता तथा असफलता का पता लगाया जा सकता है। हाल ही में हुए सकल जन आंदोलन से यह बात स्पष्ट हो जाती है। किसी भी क्षेत्र या विभाग का घोटाला हो, भ्रष्टाचार सम्बंधी मामला हो, कुपोषण या शिक्षा का गिरता स्तर हो। यह हमें गणना द्वारा ही पता चलता है। किसी मुद्दे पर निर्णय होने से पहले सदस्यों के बीच चर्चा होनी चाहिए सही गलत के आँकलन के लिए पक्ष—विपक्ष पर बहस होनी चाहिए क्योंकि चर्चा या विचार—विमर्श का उद्देश्य समस्या का समाधान निकालना है। सर्वसम्मति से ही निर्णय का प्रतिपादन किया जाना चाहिए। तभी एक सशक्त तथा सुदृढ़ लोकतन्त्र बन सकता है। इसके लिए युवा पीढ़ी को आगे आना चाहिए। नई पीढ़ी वर्तमान वैश्विक चुनौतियों का सामना करने लिए तथा इस प्रतिस्पर्धा के दौर में साहस से खड़े होने की क्षमता रखती है।

हमारे लोकतन्त्र में धीरे—धीरे ही सही पारदर्शिता अवश्य आनी चाहिए। आज यह सोच तो बन रही है कि भ्रष्ट छवि वाला जनप्रतिनिधि नहीं होना चाहिए क्योंकि "संविधान लोगों को नियंत्रित करने वाला सरकार का उपकरण नहीं, बल्कि सरकार को नियंत्रित करने वाला लोगों का उपकरण है।"

॥SVB gsjh vefj d hod hy j vej mt ky k6

भारत गतिशील लोकतन्त्र है। जनप्रतिनिधियों को भी यह समझना चाहिए कि बार वोट के बाद जनता आंदोलन को अपनाकर अपना अधिकार समान्य नहीं कर देती है। भ्रष्टाचार के खिलाफ श्री अन्ना हजारे जी के आंदोलन को जितना व्यापक जन समर्थन मिला उसकी कल्पना सरकार ने भी नहीं की होगी। इसलिए मुर्दा का सुलझाने के लिए जागरूक होकर जनआंदोलन होने चाहिए। तभी भारत का सपना पूरा हो सकता है। इस प्रकार स्पष्ट है कि लोकतन्त्र में जनसंस्थिकी का विशेष महत्व है। निष्कारता, गरीबी—अमीरी आदि का पता जन गणना के आधार पर ही लगता है।

LAN K ZXFK %

- (1) लोकतन्त्र टी. टी. वी. के वैश्विक कार्यक्रमों में 2011
- (2) जनसंख्या सर्वेक्षण सूत्र
- (3) ऐतिहासिक जनसंस्थिकी और आर्थिक संस्थिकी
- (4) ब्राह्मण सर्वेक्षण वैश्विकी अवसर
- (5) वीओ वैश्विकी ए.पी.सी. ऑफ सिविलिस

Steel Industry

This industry has been a significant contributor to India's economy for over 400 years and is still registering growth in excess of 4%. India is currently the 10th largest steel producer in the world employing over 500 thousand in the region. There are a handful of significant contributors to this business; Steel Authority of India, Bokaro Steel Plant, Rourkela Steel Plant, Durgapour Steel and Bhilai Steel that contribute to a nearly 28.3 million ton industry.

Mining Industry

This industry employs over 700 million and contributes between 10 and 11 percent of the sectors GDP.

Petroleum Industry

This industry in India has been operating since 1867. It has continued to grow and is currently an active global player in this category and has been so for the last several decades.

Software Industry

This particular area has been one of the fastest growing parts of the Indian economy. It has most recently shown a 42.3% Compounded Annual Growth Rate (CAGR). Continued investment opportunities occur today as more and more western companies look to tap the talent rich Indian workforce.

OUTSOURCING—BPO AND IT INDUSTRIES

Views of American jobs being created and supplemented overseas with much of it ending up in India has been a point of contention for several years. As recently discussed in USA Today the cost to hire and employ overseas works can be as much as 65% less than it would be to hire an American who many times may actually have less experience. While public sentiment about this is strong it is difficult for companies to simply ignore the huge savings. These savings many times allow companies to advance research and keep pricing to the end user at a lower rate.

As regards the call center industry, we would like to highlight the use of India's highly growing and educated workforce that has made it a hot bed of call center growth and utilization. From the standpoints of the American businesspeople, when they work with outsourcers operating in India the benefit of having a balanced workforce spread across the globe can help capitalize on benefits of the region. India has a very technically competent employee base and with so many call centers many employees have significant amounts of experience in the call center industry. One additional cost that has almost created a niche market is the training industry and how it relates to training cultural uniqueness and dialects. For companies in India that service American consumers the greater they can master dialects and nuances the more successful they can be many times. A large population of Americans prefers speaking to those with similar accents. This is not unique simply to Americans. In a recent study it was found that people prefer talking to people in their region of the world, sometimes even their region of the country. Because of this phenomenon, companies have created programs that are used all across the globe to help foreign employees understand and master the language differences of countries, with much emphasis on the United States.

INFORMATION TECHNOLOGY TRENDS

One of the most accurate indicators of growth and expansion is data that relates to IT infrastructure and trends. In many reviews of country performance the two largest emerging exporters, China and India, are compared to one another to determine success path. Recently an independent survey was conducted comparing the two countries in multiple categories related to several factors that contribute to growth, from IT to telecom to capital available. The scale measured multiple indicators and assigned a point system to each of the categories listed below with 0 being the lowest and 8 being the highest indicator. Below are the results of this survey;

COMPARISON ANALYSIS INDIA VS. CHINA—COMMUNICATION INFRASTRUCTURE

Additional insight on the significant growth of India's service outsourcing can be gained when reviewing exports trends over the last several years.

SESSION III

A thick grey L-shaped line is positioned below the text 'SESSION III'. The horizontal part of the line extends to the left, and the vertical part extends upwards from the right end of the horizontal line.

Consequences of Sudden Declines of Capital Flows: Evidence from India

Minakshi Paliwal¹ and Sumanjeet²

¹Assistant Professor, Dept. of Commerce, Bharati College, University of Delhi, Delhi

²Ramjas College, University of Delhi, Delhi

Abstract—The existing literature on causes of sudden declines of capital flows suggests that various factors can induce sudden Declines. Moreover, sudden declines look different across different groups of countries as well as types of financial crises. Stylized facts of sudden declines also illustrate that sudden declines are associated with output costs, but adverse output performance varies substantially. The variation in output performance seems to depend on the degree of financial turmoil reflected by different forms of financial crises. Hence, different factors appear to induce different kinds of sudden declines, which in turn cause different output performance in the aftermath of sudden declines. Therefore, the study of output consequences of sudden declines of capital inflows seems necessary in order to understand the complete story of sudden declines. In the present paper an attempt has been made to study the quantitative and qualitative consequences of sudden declines of capital flows in the Indian context.

Keywords: Sudden Declines, Capital Inflows, Crisis, India; JEL Codes: E2; E3; F 21; F32; G28

EFFECT OF SUDDEN DECLINES IN QUANTITATIVE (MONETARY) TERMS

The effect of sudden declines of capital inflows can be measured through the following equation:

$$CI = CAD + AR$$

Where, CI stands for capital inflows slowdown, CAD stands for current account deficit and AR stands for accumulation reserves. Effect of sudden declines can be measured through the increase in current account deficit and decrease in accumulation of foreign reserves. The Current Account deficit is the country's trade deficit plus interest payments on what the country borrows from foreigners to finance the trade deficit. Or in simply,

$$CAD = M - X + I$$

i.e. the trade deficit equals to the imports minus exports and current account deficit equals to the trade deficit plus interest payments on the borrowings to finance trade deficit. Post the 1991 BoP crisis, policymakers in the country have ensured that the current account deficit does not rise above 2% of GDP, a kind of self-imposed prudential limit. However, the dynamics of current account have changed over the past two years. In 2008-09, for the first time since the 1991 BoP crisis, India's current account deficit widened to more than 2% of GDP (2.4%). In the first half of 2008-09, a large spike in crude oil prices in mid-2008 to \$145/bbl pushed oil imports up suddenly. Oil balance (imports less exports) deteriorated to -5.4% of GDP in 2008-09 from -4.3% of GDP in 2007-08. In 2009-10, the current account deficit has widened further to 2.9% of GDP, even though oil prices were moderate at an average of \$70/bbl. If we look at the quarterly trend, it appears that the current account deficit has only deteriorated further to 3.5-4% of GDP (\$45-50 billion). The movement of current account deficit is shown in the figure 1:

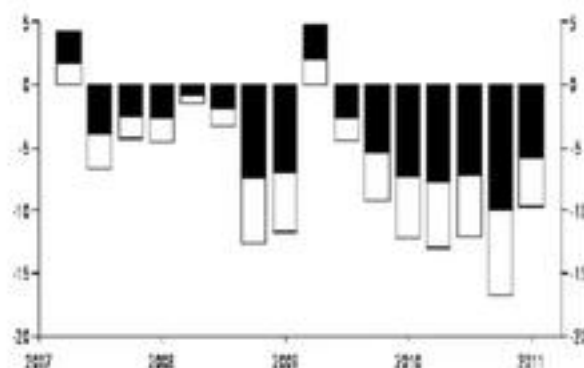


Fig. 1: India's Current Account Balance (in US \$ Billions)

(Source: Handbook of Statistics, Reserve Bank of India)

Figure 1 indicates that the movement of current account balance during and after the time of sudden declines of capital inflows (Crises). The above figure clearly indicates that the current account deficit has widened with the intensity of the crisis. However, it resumed in the beginning of 2009. But since then the current account deficit has widened historically which clearly indicates that the impact of sudden declines is not yet over.

To measure the impact of sudden declines of capital inflows quantitatively, the researcher uses the above equation and results of the above equation is shown in the table 1:

Table 1: Impact of Sudden Declines of Capital Inflows (in US \$ million)

Year/Quarter	CAD	AR	CI (Impact of SD)
Q2nd 2007	4532	213362	-
Q3rd 2007	4257	247762	Nil
Q4th 2007	3511	275316	Nil
Q1st 2008	3438	309723	Nil
Q2nd 2008	3274	312087	Nil
Q3rd 2008	12575	286336	35052
Q4th 2008	11668	255968	Nil
Q1st 2009	1212	251985	Nil
Q2nd 2009	4454	265142	Nil
Q3rd 2009	8773	281278	20455
Q4th 2009	12187	283470	5606
Q1st 2010	12998	279057	-3602

(Source: Reserve Bank of India; CI= Self computed)

Table 1 indicates the impact of sudden declines of capital flows in quantitative terms. The results presented in the above table show that the amount of SD of capital inflows increases in the times of crises but up to the last quarter of 2009 the value of SS did not decrease so much. Therefore, the table shows that the impact of SD of capital flows are US \$ 35052 million in the third quarter of 2008 and in the 3rd quarter of 2009 the amount of sudden declines of capital inflows amounts to US \$ 20455 million. Sudden declines may also have severe consequences like collapse in output, employment reduction, and decline in the value of domestic currency etc.

QUALITATIVE EFFECT OF SUDDEN DECLINES OF CAPITAL INFLOWS

Sudden declines of capital inflows have a harmful effect in an economy. When there is a sudden decline of capital inflows then it will lead an economy into insolvency and affect many macroeconomic variables like exchange rates, interest rates, foreign exchange reserves and domestic monetary conditions etc. When there is sudden reversal of capital inflows then it reduces the growth rate of an economy, increases the interest rates and depreciates the currency and others. Effect of sudden declines of capital inflows in qualitative terms can be explained through the following points:

IMPACT ON EXCHANGE RATE

Sudden declines of capital inflows affect the value of currency i.e. it depreciates the value of currency. Due to flight of foreign funds, Indian currency depreciated more than 21 % in 2008-09, and demand for rupee has simultaneously, dipped because capital inflows were down. Added to this depreciation of currency will lead to higher cost of imported goods and make some of the capital intensive projects more expensive to execute. The impact of sudden declines of capital inflows on Value of currency can also be shown from the following figure:

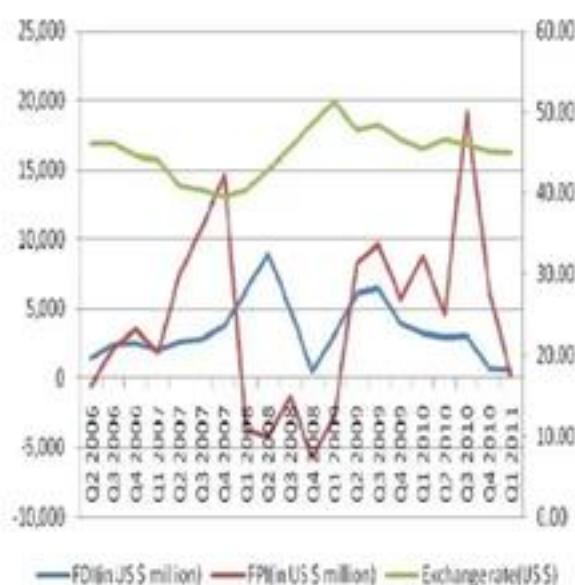


Fig. 2: Exchange Rate of Indian Rupee in Terms of US\$

(Source: Data Source: Monthly Report on Indian Economy, CMIE)

Figure 2 shows that the movement of foreign capital and Indian rupee in terms of Dollar. It shows that the sudden Declines of capital inflows hit the exchange rate. The figure also shows that the value of Indian rupee moves with the movement of FDI mainly. The liquidity crisis along with FII sell off has forced the Indian Rupee to devalue (Sumanjeet, 2009b) like never before and in a span of 9 months the Indian Rupee has slipped from around Rs 40/US \$ to Rs 47/ US \$. And up to December 2010, the value of Indian rupee not strengthening so much; it shows that the impact of SD is not yet over.

FALL IN FOREX RESERVES

There are number of studies exploring the relation of surging capital inflows with the forex reserves. Most of the studies revealed that there is a direct relationship between capital inflows and forex reserves. However forex reserves are also affected by number of other factors such as international trade and most importantly exchange rate. Figure 3 shows the relationship of capital inflows with forex reserves.

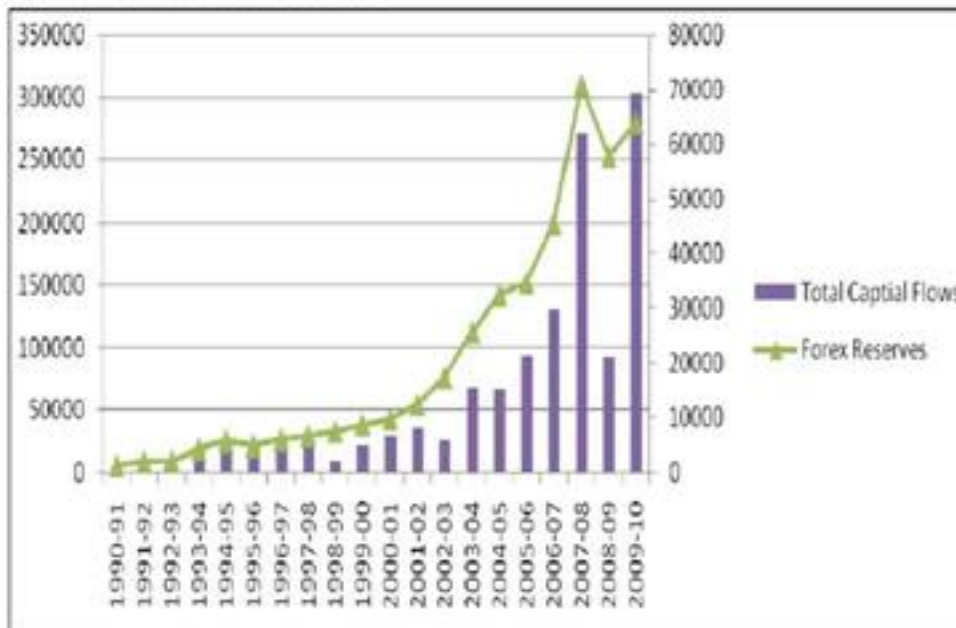


Fig. 3: Capital Inflows and Forex Reserves

Data Source: Reserve Bank of India Bulletin (RBI) and Monthly Report of Indian Economy, CMIE

The above figure clearly shows that forex reserves moves with the movement of total capital flows. If there is sudden decline in capital inflows, it leads to decline in forex reserves. India's foreign exchange reserves have grown significantly since 1991. The reserves, which stood at US\$ 5.8 billion at end-March 1991, increased gradually to US\$ 25.2 billion by end-March 1995. The growth continued in the second half of the 1990s with the reserves touching the level of US\$ 38.0 billion by end-March 2000. Subsequently, the reserves rose to US\$ 113.0 billion by end-March 2004, US\$ 141.5 billion by end-March 2005, US \$ 151.6 billion by end March 2006, US\$ 199.2 billion by end-March 2007 and further to US\$ 309.7 billion by end-March 2008. Thereafter, the reserves declined to US \$ 286.3 billion by end September 2008 (Sumanjeet, 2010). Thereafter the reserves declined to US\$ 252.0 billion by end March 2009.

FALL IN GDP GROWTH RATE

Second, the sudden declines of capital inflows and liquidity crises have slowed India's economic growth. GDP started decelerating in the first quarter of 2007-08, nearly six months before the outbreak of US financial crises and considerable ahead of the surge of recessionary tendencies in all developed countries from August-September 2008. That was just the beginning of slowdown impact on "India's GDP growth. GDP growth for 2008-09 was estimated at 6.7% as compared to the growth of 9.0% posted in the previous year. Growth rate of India i.e. growth in GDP dropped to 5.8 per cent (year-on-year) during the second half of 2008-09 from 7.8 per cent in the first half. But till now in the first quarter of 2011 GDP growth is 8.2%, whereas in the second quarter of 2007, was 9.6%. It means the impact of decline of capital inflows is still not over. This can also be shown from the figure 4:



Fig. 4: Relationship between Foreign Capital and GDP Growth of India

Data Source: IndiaBudget.com

Figure 4 shows the relationship between the components of foreign capital and GDP growth rate of India. The above figure clearly shows that the GDP growth rate of India mainly affected by the movement of FDI. But at the time of crises GDP growth of India is affected by the movement of FPI mainly.

FALL IN INDUSTRIAL OUTPUT AND RISE IN INFLATION

Sudden declines are events in which domestic economies lose their access to international capital markets. Hence, any activities financed by foreign funds must undergo certain adjustments such as cutting down these activities (e.g. reductions in investment). Further, India's industrial output fell at its fastest annualized rate in 14 years, despite tax cuts and fresh spending programme announced by the government of India in December and January to boost domestic demand. Data released by CSO showed that the factory output shrank by 1.2 per cent in February, on a weak global and domestic demand. This is against growth rate of 9.5 per cent during the same month a year ago. Industrial output thus grew 2.8 per cent during April-February, against 8.8 per cent in the same period a year ago. Manufacturing, which constitutes 80 per cent IIP (Index of Industrial Production), contracted by 1.4 per cent in February, as production of basis, intermediates and consumer goods shrank compared to a year ago. Now Industrial Production in India expanded 7.3 per cent in March of 2011. Industrial production measures changes in output for the industrial sector of the economy which includes manufacturing, mining, and utilities. Industrial Production is an important indicator for economic forecasting and is often used to measure inflation pressures as high levels of industrial production can lead to sudden changes in prices. From 1994 until 2010, India's industrial production averaged 7.49 percent reaching an historical high of 17.70 percent in December of 2009 and a record low of -0.20 percent in December of 2008 (Figure 5).

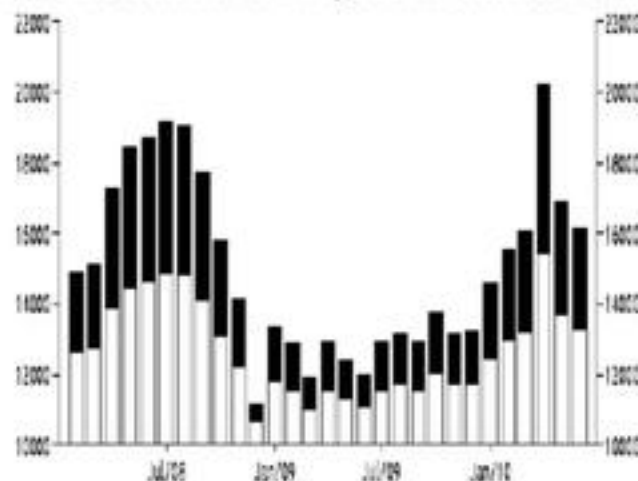


Fig. 5: Falling Industrial Production in India (% Change Year on Year)

Source: Tradingeconomics.com

Similarly, for a little over a year after the outbreak of sudden declines of capital flows, the global economy experienced, between September 2007 and October 2008, a pronounced stagflationary phase, with the growth slowdown on the one hand and rising inflation on the other hand (Figure 6).

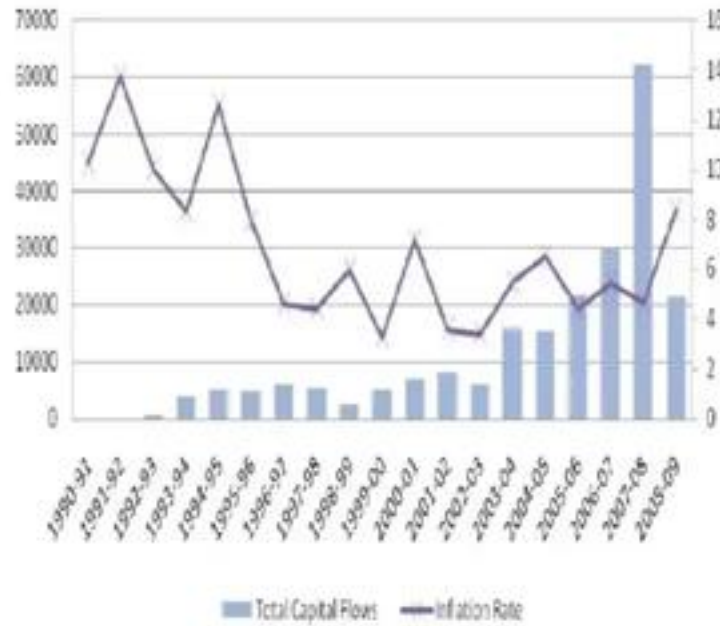


Fig. 6: Total Capital Flows and Inflation Rate of India

Source: Economic Survey (Various Issues and Handbook of Statistics, RBI).

As a general rule, sudden decline of capital flows reduces the industrial production. Reduced industrial production leads to shortage of goods and services in the market, which basically affects the prices of commodities in the markets. Further, inflationary pressure depletes consumer’s sentiments in the market. Depleted consumer sentiment leads to a fall in consumer spending consequently leading to lower demand in the economy.

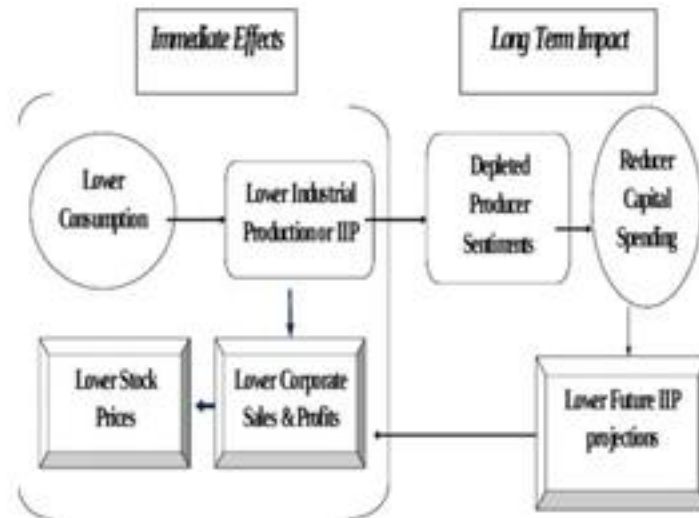


Fig. 7: Short Term and Long Term Impact of Inflation

If people are not buying more then why would companies produce more? This leads to lower growth or sometimes even de-growth in IIP. Thus, usually the immediate impact of poor IIP figures is falling stock prices. Over the long term, continuous lower consumption leads to lower producer confidence. Negative sentiment about future demand further leads to reduction in investment activity & hence slows down the capital spending. This has an adverse impact on future sales & profits of the companies. Thus, the negative sentiment leads to an adverse investment atmosphere for both institutional and retail investors.



Fig. 8: How Industrial Production Affects the Stock Market

Source: Indian Economy Survey (Various Issues) and

SEBI BULLETIN

Lower supply coupled with lower demand can have catastrophic impact on stock market and was one of the main reasons for drop in Sensex from 20000 to 8000 in 2008. Thus, lower IIP is bad news for the Stock Market (Figure 8) as well as for the growth of the economy. Industrial production has an inverse relationship with unemployment, rising industrial production usually leads to falling unemployment and falling industrial production means rising unemployment. When companies reduce production shifts or shut down factories because of falling demand, they lay off staff, which increases unemployment. When demand increases, companies increase production and hire more staff, which lowers unemployment.

Further, industrial production has an inverse relationship with unemployment, rising industrial production usually leads to falling unemployment and falling industrial production means rising unemployment. When companies reduce production shifts or shut down factories because of falling demand, they lay off staff, which increases unemployment. When demand increases, companies increase production and hire more staff, which lowers unemployment. But, it is very difficult to generalize the impact of capital flows on employment. As a general rule, increase in capital flows will lead to increase in industrial production and rise in industrial production will lead to increase in employment opportunities. But, sudden increase in capital inflows will appreciate the value of currency and exports will go down. If exports will go down, unemployment will increase. On the other hand, sudden decline of capital flows depreciate the value of currency and increase the exports. Again important point of discussion is that, as a general rule exports should increase during the sudden declines of capital inflows. But, in India, the story is different, as India has major share of re-exports items in total exports. Imports will go down because of fall in the value of currency.

CAPITAL MARKETS

The stock market started declining from January 2008, and till September 2008, just prior to Lehmann filing for bankruptcy; Bombay Stock Exchange (BSE) Index lost 33% of its peak January 2008 value. However, post-September 2008, the Bombay Stock Exchange (BSE) index went down by a further 40%, following a sharp decline in stock markets across the world, shift in international investors' preferences, and resultant withdrawal of portfolio investments (Sumanjeet and Paliwal, 2010). The capital market has however started recovering since March 2009. The years prior to the crisis had been particularly good for the primary capital market. However, during FY 2008-09, resources mobilized through the primary market came down substantially. Therefore, the movement of BSE SENSEX can be shown as (Figure 9):

The chart (9) plotted above shows that there is a positive elation between FII investment and the Sensex. Also look at the encircled region on the chart. It shows that the rise of Sensex in 2007 was largely fuelled by the money pumped in by the FIIs which led to the market touching 20,000, but in 2008, with the global economy in doldrums, the FIIs were net sellers and took the market down.

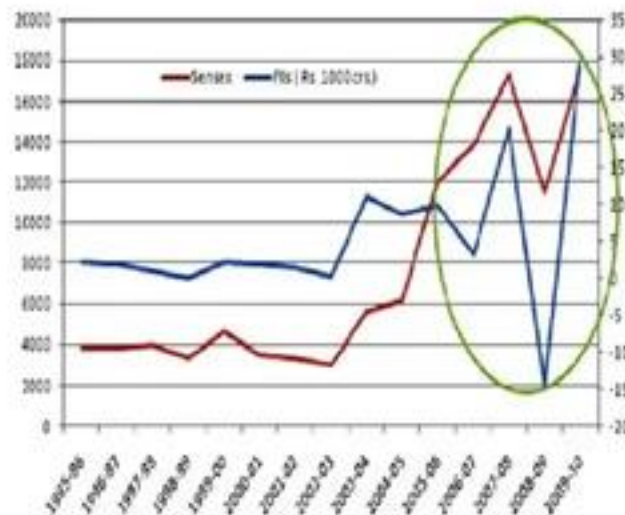


Fig. 9: Foreign Capital (FIIs) and Capital Market Movements (BSE Sensex)

Source: Stockshastra

OTHER IMPLICATIONS

As the external (foreign) sources of credit for companies were drying up in the wake of the global financial crisis, there was a sharp increase in domestic credit during April–October 2008. The increase seems to be due to the substitution effect. However, towards the later part of FY 2008–09, credit growth declined due to a slowdown in the economy in general and the industrial sector in particular. On a full year basis, bank credit growth fell from 22.3% in FY 2007–08 to about 17.5% during FY 2008–09. Further, India's balance of payments underwent major shifts in 2008–09 that resulted from the transmission of the direct impact of sudden declines of capital flows to India. The current account deficit shot up to 2.6 per cent of GDP in 2008–09 from 1.5 per cent of GDP in 2007–08. And this is the highest level of current account deficit for India since 1990–91. The impact on the capital account was more pronounced as the capital account surplus dropped from a record high of 9.2 per cent of GDP in 2007–08 to a meager 0.8 per cent of GDP in 2008–09. And this is the lowest level of capital account surplus for India since 1981–82. The year ended with a decline in reserves of US\$20.1 billion (inclusive of valuation changes) against a record rise in reserves of US\$ 92.2 billion for 2007–08.

CONCLUSION

This paper provides an overview of consequences of sudden declines of capital flows into India. Sudden declines of capital flows have a harmful effect on an economy in both the terms *i.e.* qualitative as well as quantitative terms. In qualitative terms, the amount of sudden declines of capital flow amounts to US \$ 35052 million in the third quarter of 2008. Similarly, in the 3rd quarter of 2009, it amounts to US \$ 20455 million, which is not very less as compared to the 2008. It means the impact of sudden declines of capital inflows is not yet over. The researcher also observes some qualitative effect of capital inflows on some macroeconomic variables such as exchange rate, forex reserves, capital market, industrial production etc. Reduced industrial production leads to shortage of goods and services in the market, which basically affects the prices of commodities in the markets. Further, inflationary pressure depletes consumer's sentiments in the market. Depleted consumer sentiment leads to a fall in consumer spending consequently leading to lower demand in the economy. It was also found that sudden declines of capital inflows in India lead to depreciation of Indian currency and leads to the decline in the value of forex reserves.

ACKNOWLEDGMENT

While bearing full responsibility for any mistakes/errors, authors wish to thank *Prof. L. N. Dahiya*; *Prof. S. D. Vashishtha* (M.D. University, Rohtak); and *Sudhandhu Kumar* (Economist, NIPFP, Delhi) for their constructive criticisms and comments on the draft version of paper.

Sudden declines may have severe consequences for the economy, as the abrupt reversal in foreign credit inflows in conjunction with a realignment of the exchange rate may cause a sharp drop in domestic investment, domestic production and employment. The adverse consequences of a sharp reversal in foreign capital inflows could be the reason that only a subset of currency/balance-of-payments crises in emerging market economies are found to be associated with recessions (Hutchison and Noy, 2002; Gupta *et al.*, 2003). Sudden declines of capital flows have a harmful effect on the economy in both the terms *i.e.* qualitative as well as quantitative terms. In quantitative terms, sudden declines of capital flows increase the current account deficit and reduce the accumulation of foreign reserves. In qualitative terms, sudden declines reduces the growth rate of the economy and affect a wide range of macroeconomic variables such as real exchange rate, inflation rate, interest rates and others.

REFERENCES

- [1] Cowan, K. and Gregorio, J. De (2006). "International Borrowing, Capital Controls, and the Exchange Rate: Lessons from Chile." Working paper 11382. Cambridge, Mass.: National Bureau of Economic Research.
- [2] Edison, H.J. and Jan, T.K., (1988), "A Quantitative Reassessment of the Purchasing Power Parity Hypothesis: Evidence from Norway and the United Kingdom," *Journal of Applied Economics*, 1987, Vol. 2, pp.309-33.
- [3] Kumar, S. (2001). "Does the Indian Stock Market Play to the tune of FII Investments? An Empirical Investigation". *ICFAI Journal of Applied Finance*, Vol. 7, No. 3, pp 36-44.
- [4] Kumar, S. (2009), "Investigating Causal Relationship between Stock Return with Respect to Exchange Rate and FII: Evidence from India", Munich Personal Repec Archive.
- [5] Mazumdar, T. (2004) "FII Inflows to India: Their Effects on Stock Market Liquidity", *ICFAI Journal of Applied Finance*, Vol. 10, pp 5-20.
- [6] Mohan, R. (2008), 'The Growth Record of the Indian Economy, 1950-2008: A Story of Sustained Savings and Investment' Reserve Bank of India Bulletin, March.
- [7] Prasanna, P.K. (2008), "Foreign Institutional Investors: Investment Preferences in India", *JOAAG*, Vol.3, No.2.
- [8] Rai, K. and Bhanumurthy N. R. (2006) "Determinants of Foreign Institutional Investment in India: The Role of Risk Return and Inflation", accessed on http://legindia.org/dis_rai_71.pdf.
- [9] Rai, Kulwant and Banumoorthy, N.R. (2004), "Determinants of Foreign Institutional Investment in India: The Role of Return, Risk, and Inflation", *The Developing Economies*, Volume XLII-4, December, pp 479-93.
- [10] Ramachandran, V. and Shah M. K. (1997) "The effects of foreign ownership in Africa: evidence from Ghana, Kenya and Zimbabwe", RPED Paper No. 81, The World Bank, Washington, D.C.
- [11] Rangarajan, C (2000), "Capital Flows: Another Look", *Economic Political Weekly*, Dec. 9, PP-4421-27.
- [12] Rao, K.S.C and Dhar, B. (2010), "Accelerating India's FDI Inflows & Conceptual and Definitional Issues", Paper presented at the Symposium on 'Concepts, Definition and Data Issues Relating to FDI in India', jointly organized by Institute for Studies in Industrial Development (ISID) and Research and Information System for Developing Countries (RIS), New Delhi, March 16.
- [13] Razin, A.; Sadka, C. and Yuen (1998), "Capital Flows with Debt- and Equity-Financed Investment: Equilibrium Structure and Efficiency Implications", *IMF Working Paper WP/98/159*; November 1998.
- [14] Sumanjeet (2010) "Indian Response to the Global Financial Crisis", *Seoul Journal of Economics*, Vol. 23, No. 1
- [15] Sumanjeet and Paliwal, M. (2010) "Liberations of Foreign Institutional Investments (FIIs) in India: Magnitude, Impact Assessment, Policy Initiatives and Issues", *Global Journal of International Business Research*, Vol. 3, No. 3, pp 22-41.
- [16] Takeshi, I., (2008). "The Causal Relationships in Mean and Variance between stock Returns and Foreign Institutional Investment in India", *IDE Discussion Paper No. 180*.

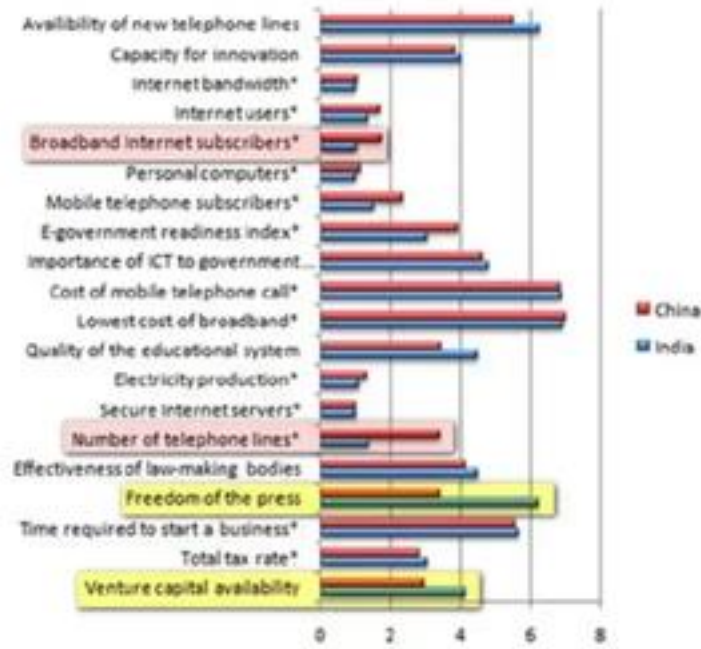


Fig. 1

COMPARISON ANALYSIS: INDIA VS. CHINA—EXPORTING

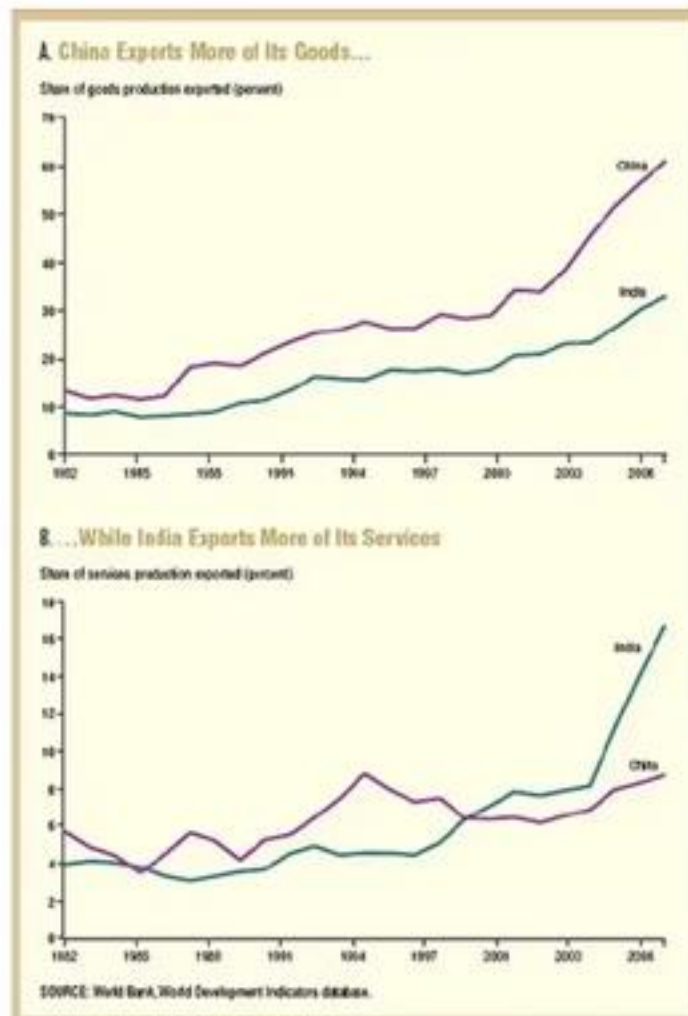


Fig. 1

Corporate Social Responsibility: The Key Role of Human Resource Management

Minal

Faculty, Institute of Business Management, Mangalayatan University, Aligarh

Abstract – Business organizations have waked up to the need for being committed towards Corporate Social Responsibility. But still majority have just been taking up some form of philanthropic activities for its stakeholders. Nurturing a strong corporate culture which emphasizes Corporate Social Responsibility (CSR) values and competencies is required to achieve the synergistic benefits. The employees of an organization occupy a central place in developing such a culture which underlines CSR values and competencies. The present study, therefore, is an attempt to explore the engagement of human resource management professionals in undertaking Corporate Social Responsibility. It also suggests Human Resource Management to take a leading role in encouraging CSR activities at all levels. The combined impact of CSR and human resource activities, which reinforce desirable behavior, can make a major contribution in creating long term success in organizations.

Keywords: Philanthropic activities, Corporate Social Responsibility (CSR), Synergistic benefits,

INTRODUCTION

Business houses, right from the inception of human race, have been regarded as constructive partners in the communities in which they operate. Though they have been instrumental in creating employment, wealth, products and services, yet the pressure on business to play a role in social issues involving employees, stakeholders, society, environment, government etc. is continuously increasing.

The society is questioning the existence of business houses, especially in the wake of the scandals and scams conducted by the business houses like UTI, Enron, and WorldCom. In response to it, the organizations around the globe are forced to wake up to the need for being committed towards Corporate Social Responsibility. Over the years this concept of Corporate Social Responsibility (CSR) has gained unprecedented momentum in business and public debate and has become a strategic issue crossing the departmental boundaries, and affecting the way in which a company does business. It has become so important that many organizations have rebranded their core values to include social responsibility. Almost all corporate websites/ policies/reports talk about their endeavors for CSR which has become a way of ensuring that the organization is fulfilling all the obligations towards society and thus is eligible for the license to operate. It assures that the organization can grow on sustainable basis. These activities of CSR ranging from small donations to bigger projects for social welfare sustainable practices differ from organization to organization depending on the resources available to an organization for undertaking sustainable practices. Business practices of big and successful companies, with plenty of resources at their end, have set the trend for being committed to sustainable practices. Such business houses around the globe show their commitment to social responsibility.

In India, the initiatives of Dabur India Limited, for example, which commenced 'Sundesh' in 1993, a nonprofit organization, with an aim to promote research and welfare activities in rural areas are appreciable. On the same track to fulfill its urge to do something for community, Bharat Petroleum Corporation Limited has adopted 37 villages as their responsibility to develop in all walks of life. It has made efforts to make them self-reliant, provided them fresh drinking water, sanitation facilities, medical facilities, vocational training and literacy camps.

(<http://www.karmayog.org/csr500companies>). Around its industrial facilities, Tata Group has created towns and cities like Jamshedpur, Mithapur, Babrala for the benefit of its employees. Cadbury India, Glaxo and Richardson Hindustan are some of the companies which are helping farmers to grow crops which in turn shall serve as raw materials for them (Tripathi & Reddy, 2006). Although the implementation of such activities involves time, effort and resources yet the business houses have realized that it (CSR) is one of the important ways in which an organization can distinguish itself from its competitors. The tangible and intangible benefits associated with for organization are immense. A powerful tool like CSR not only enhances the brand image and reputation of the business but also leads to improvement in sales and customer loyalty, and increased ability to attract and retain employees. By capitalizing on it, the organizations can improve their financial performance and attract more investment with immense economic value. The word CSR has, as a result, occupied very important place in the plans and strategies of the organizations in the present era. But still there are numerous organizations which understand CSR as undertaking some donations or philanthropic activities. Rather in its true sense CSR constitutes a strong commitment to social obligations and internalization throughout the organizational culture which lays emphasis on the execution of the obligations towards the employees and involving them in responsible endeavors. However from the very beginning the key player in undertaking such activities in the organizations has been top management and it has been the driving force in the area of social responsibility. Employees have been rarely covered under the ambit of CSR. To ensure organization-wide commitment, nonmanagement workforce has to be involved in the process. This involvement of employees speaks of the strategic contribution of Human Resource Management (HRM) in CSR. In this context, the responsibility of human resource management department for encouraging sustainable practices that offer practically and theoretically new opportunities is very much. So the present composition is an attempt to find out that how the staff can become the brand ambassadors of the organizations and that "feel good factor" can permeate out to others, especially customers and client. To commensurate that it will try to suggest a plan of action by analyzing the

CSR activities of various organizations to promote sound corporate citizenship which is necessary for the development of a culture for social responsibility. Divided into three sections, the present study shall put light on the studies emphasizing the involvement of human resources in socially responsible endeavors in Section I. Section II proposes suggestions on internalizing social responsibility by underlining the contribution of Human Resource (HR) and Section III concludes the study.

LITERATURE REVIEW

Different researchers at different points of time have emphasized the critical importance of HR for the proper implementation of CSR and the role that HR can play in developing the process where the business objectives are assessed and values re-aligned to match them with staff expectations. Greening & Turban (2000) found that job applicant and employee perceptions of a firm's CSR determines their attractiveness towards the organizations. Moving on the same track Cropanzano et al (2001) demonstrates that employee attitudes and behaviors are heavily influenced by fairness of organizational actions towards them.

In a survey conducted by Cherenson group, a New Jersey based public relations and recruitment ad agency; in 2002 found that the most important factors affecting the reputation of an organization as a place to work in are the way the employees are treated and the quality of its products and services (http://www.hrsguide.net/usa/co/commitment/employer_branding). Further Good relationships with employees also allows a company to gain additional benefits including improving their public image, increasing employee morale, and support from the community (Zappala and Cronin, 2002).

Nancy (2004) while discussing the role of HR in developing CSR culture in organizations emphasized that with the growing importance of human capital as a success factor for today's organizations, the role of HR leadership has become more critical in leading and educating organizations on the value of CSR and how best to strategically implement CSR policies and programmes domestically and abroad. In view of this HR must be aware that effective CSR means respect for cultural and developmental differences and sensitivity to imposing values, ideas and beliefs when establishing global HR policies and programmes.

Redington (2005) with the help of twelve case studies, while underlining the HR professionals' key role in managing the changes required for CSR activities to succeed, stated that employees are the most neglected though most important stakeholder of the organization for conducting CSR activities. While accentuating on this issue he said that having a good reputation socially implies that a company's behaviour towards its people is consistent and is of a particular standard in which they are valued in as much as the external stakeholders.

Rupp et.al (2006) accentuated that CSR plays a role about fostering positive social relationships between organizations and communities. They highlighted that employees will turn to CSR to assess the extent to which their organization values such relationships and so high levels of CSR can meet employees' need for belongingness with the organization and the society.

A survey by Sirota Survey Intelligence (2007) affirmed that employees who are satisfied with their organization's commitment to social and environmental responsibilities are likely to be more positive, more engaged and more productive than those working for less responsible employers and when employees are positive about their organizations' CSR commitment, their engagement rises to 86 per cent. On the other hand, when employees are negative about their employer's CSR activities, only 37 per cent are highly engaged. Similarly, Murray (2008) on the basis of survey stated that more than one-third of respondents pointed that working for a caring and responsible employer was more important than the salary they earned and nearly half would turn away from an employer that lacked good corporate social responsibility. However Fenwick & Bierema (2008) has pointed that HR department, which has the potential to play a significant role in developing CSR activities within the organization, found to be marginally involved or interested in CSR. Mehta (2003), in a survey, found that only 13 per cent of the companies involved their employees in undertaking the various CSR activities. Moreover, the employees have also been less likely to fully internalize the corporate culture (Rupp, et. al, 2006). The implementation of the CSR policy has also traditionally been in the hands of 'management' and 'employees' as the non-management workforce have been less likely to be involved in developing and implementing a policy on business responsibility towards society. There are large variations in the understanding of CSR in the head office and the local plant or sales office of an organization (Young, 2006). The perceptions of workers and management also differ about whether an organization is complying with such regulations as related to labour or working conditions (Mehta, 2003).

Agarwal (2007) stated that with the adoption of HR policies, such as, periodic review of employee performance, adequate training for the workforce and career advancement norms for its personnel, creating motivation, and commitment in the workforce the organization can reap the full business benefits and become successful to the great satisfaction of all its stakeholders.

This is also reinforced by Malakarjunan (2006). Emphasizing upon such dimensions Krishnan & Balachandran (2004) pointed out the role of HRM in incorporating responsible practices within an organization. It is due to the lack of involvement of employees and failure to embed the socially responsible values into the organizational culture that many CSR initiatives inevitably fail and their policies just become an exercise in public relations (Mees & Bonham, 2004). The above verdicts of different researchers at different points of time entail that no doubt they have underscored the role of employee involvement through HR in various socially responsible initiatives of organization. But they have paid little attention on this aspect that how the internalization of CSR culture can happen with the initiatives of HR department of organization. How the company's values and policies for corporate responsibility can be reflected through various HR functions and consequently how the HR function can be a powerful agent in effecting company-wide progress in its CSR performance. With this backdrop in mind present study has designed.

INTERNALIZING CSR: INITIATIVES OF HRM

The role of HR function in embedding the CSR values in the corporate culture is immense and has been underlined also. An organization can exhibit a better image in the minds of people by presenting itself as an excellent employer which cares for its people and involves them in the ambit of social responsibility. This involvement of employees indicates the strategic importance of HRM in the CSR initiatives of an organization. Human Resource policies, forming the framework for the culture in the business management, create awareness towards the need to achieve the business goals in the best possible and ethical manner (Agrawal, 2007). With the help of HR functions, the socially responsible values can be inculcated and sustained in the organizational culture through the following ways:

1. The HR department should take the responsibility to develop a formal policy on sustainable practices involving employees. British gas, for example, used employee volunteering as a vehicle to achieve business-driven culture. The success of the initiative led to the development of a formal policy on employee volunteering. The company developed the 'Cardiff Cares' volunteering initiative with the purpose of encouraging employees to raise funds and donate some of their time to the local community (Redington, 2005). Employee fundraising was a way to show support for the local community, to build positive team spirit in the organization and to create a 'winning' environment at the workplace. The managing director and the HR team's strong commitment enabled the initiative to be a big success improving the employee retention levels and employee satisfaction.
2. The orientation programme of newly recruited candidates should be designed in a manner that corporate philosophy about CSR gets highlighted. The commitment of top management towards CSR is very important which should be expressed in tangible terms to reinforce the right kind of behavior in the organization. Wipro, for example, inculcates CSR values amongst its workforce right at the beginning during the induction process (<http://www.developednation.org/interviews>). Corporate presentations, keeping employees updated through mails, regular newsletters are the instruments used to keep employees energized about the organization's socially responsible initiatives. Socially responsible initiatives taken by employees. This becomes important as the internalization of CSR in an organizational culture requires that appropriate behaviors get appraised, appreciated as well as rewarded. Otherwise, the organization might fail to inculcate it amongst all employees due to lack of positive reinforcement.
3. The Training facilities may also be made available to instill the CSR culture among employees. This becomes necessary to make employees learn and practice CSR activities. The training of employees through "CSR Living Our Values Learning Tool" at Cadbury Schweppes (Young, 2006), the major global beverage and confectionary organization, has been a good example of partnership between HR and CSR. The company has also included social responsibility in the latest management development initiatives like the global "Passion for People" management skills programme.
4. Empowerment of managers by giving them decision-making authority shall help in executing social responsibility at local level. It becomes important when an organization with plants or units at multiple locations around the world operate. Armed with decision making authority, the managers will be able to appreciate and assess the needs. Therefore, the employees may be appropriately authorized to encourage initiative in the area of social responsibility. Clear reporting and review mechanisms may be put in place in the organization which shall improve the focus and effectiveness of CSR (Mehta, 2003).
5. The designing of Performance Management System should be done in such a manner that it measures the socially responsible initiatives taken by employees. This becomes important as the internalization of CSR in an organizational culture requires that appropriate behaviors get appraised, appreciated as well as rewarded. Otherwise, the organization might fail to inculcate it amongst all employees due to lack of positive reinforcement.
6. Code of ethics of an organization can stimulate social responsibility to a great extent reinforcing amongst its employees the underlying values. Training on code of ethics should be undertaken by the organization. Buy, a fortune 100 company and the largest specialty retailer of consumer electronics in the United States and Canada, has initiated ethics training for its employees. Electronic Data Systems(EDS) has a global CSR strategy which is well supported by HR function and the employees (Redington, 2005). The HR department of the company has also developed an e-learning course for its employees built around the Department of Trade and Industry, CSR Competency framework.
7. Responsible Human Resource Management practices on equal opportunities, diversity management, whistle blowing, redundancy, human rights, harrasment shall give credibility to the CSR initiatives of the organization. It is beyond doubt that protecting human rights such as denial or prevention of legal or social rights of workers is a very important issue under CSR. Companies like Wipro, Infosys, Dabur, and ICICI have even framed whistle blowing policy, providing protection to the employees who come to know about any unethical practice going on within the organization, covering a whole gamut of subjects and showing their positive approach towards unethical practices.
8. The separation of employees during mergers, acquisitions, downsizing etc. should be strategically aligned with the business strategy as well as Corporate Social responsibility. Retraining, retention, redeployment of people can be worked out with aggressive communication, information campaigns and outplacement services in place to assist the transition of people from the organization. Hindustan Unilever Limited (HUL), for example, provided outplacement services to the employees of its foods division at Bangalore when they were unable to move to Mumbai in 2006. Over 60 firms and 25 placement agencies were contacted by the company to arrange for multiple job interviews for a number of employees (<http://timesofindia.indiatimes.com/articleshow>)

9. Social Reports or Sustainability Reports should be prepared to underline the organization's commitment to social or sustainable practices. In India, the top management, in their messages, speeches to shareholders and in annual reports has been resorting to social reporting but it should be made more formal in nature (Bhatia, 2005 & Raman, 2006). Tata Steel Limited, for example, has been preparing Sustainability Reports under the stringent guidelines of Global Reporting Initiatives, 2002 on economic, environment and social performance (<http://www.tatasteel.com/corporatesustainability>).
10. The Human Resource department should effectively measure and evaluate CSR activities. The value added by CSR in the form of direct results, such as, economic savings and indirect results like increase in employee satisfaction, less employee turnover, measured by staff attitude surveys, shall indicate contribution to improved business performance. There is also a need to conduct periodic review of the CSR activities. CurAlea Management Consultants Pvt. Ltd.(2007) has suggested for conduction of periodically an independent internal review or audit of the effectiveness of CSR programmes (http://www.curalea.com/pdf/CurAlea_ApproachPaperforAuditofCSR).

CONCLUSION

Successful programmes on social responsibility rely heavily on enlightened people management practices. In this context HR department is assumed to be the coordinator of CSR activities in getting the employment relationship right which is a precondition for establishing effective relationships with external stakeholders and thus can orient the employees and the organization towards a socially responsible character. There is also an increasing trend in the corporate sector which has started leveraging upon employees and their management for exhibiting their commitment towards CSR. Armed with a strong and committed organizational culture reinforced by responsible Human Resource Management practices, the organizations can achieve heights of success by improved profitability, employee morale, customer satisfaction, legal compliance and societal approval for its existence. It is high time for all other organizations which have been paying only lip service to CSR that they must capitalize upon the existing Human Resource Department in framing such practices, procedures and policies that ensure the internalization of quality, ethics and excellence in the whole system. By doing this they can sensitize the employees and the whole organization towards CSR without adding any additional cost. To recapitulate it can be said that companies have increasingly felt the need to co-ordinate their CSR activities and demonstrate their commitment to social responsibility. But delivery, not rhetoric, is the key in developing the trust of external stakeholders for any organisation and it cannot be done without beginning charity at home. To do that social responsibility needs to be embedded in an organisation's culture to bring change in actions and attitudes in which Human Resource can play a significant role. Otherwise, CSR may run the risk of being categorised as shallow 'window-dressing'.

REFERENCES

- [1] Agrawal K. (2007) "Corporate Excellence as an Outcome of Corporate Governance: Rethinking the Role and Responsibility of HRM" the ICFAI Journal of Corporate Governance, Vol.VI (1): pp 6-16.
- [2] Bhatia S (2005) "Business Ethics and Corporate Governance", Deep and Deep Publications Pvt. Ltd., New Delhi.
- [3] Cropanzano R., Byrne Z.S., Bobocel Dr., & Rupp D. E.(2001) "Moral virtues, fairness heuristics, social entities, and other denizens of organizational justice", *Journal of Vocational Behavior*, 58: pp 164-209.
- [4] Fenwick T. and Bierema L. (2008) "Corporate Social Responsibility: Issues for Human Resource Development Professionals" *International Journal of training and Development*, Vol. 12(1).
- [5] Greening D.W. and Turban D.B. (2000) "Corporate social Performance as a competitive advantage in attracting a quality workforce," *Business and Society*, 39: pp 254-280.
- [6] <http://timesofindia.indiatimes.com/articleshow>
- [7] http://www.curalea.com/pdf/CurAlea_ApproachPaperForAuditofCSR
- [8] <http://www.developednation.org/interviews>
- [9] http://www.hrmguide.net/usa/commitment/employer_branding
- [10] <http://www.karmayog.org/csr500companies>
- [11] <http://www.tatasteel.com/corporatesustainability>
- [12] Krishnan K, Sandeep and Balachandran R. (2004) "Corporate Social Responsibility as a determinant of Market Success: An Exploratory Analysis with Special Reference to MNCs in Emerging Markets," paper presented at IIM K- NASMEI International Conference.
- [13] Malikaarjunan K (2006) "Best of HRM Practices", *HRM Review*, Vol. VI (2): pp 33-34.
- [14] Mees A. and Bonham J. (2004) "Corporate Social Responsibility Belongs with HR", *Canadian HR Reporter*, Vol. 17(7): p11
- [15] Mehta B. (2003) "Corporate Social Responsibility Initiatives of NSE NIFTY Companies: Content, Implementation, Strategies & Impact", retrieved on from http://www.nseindia.com/content/research/res_papers.
- [16] Murray N.E. (2008) "Corporate Social Responsibility is the Number One Criteria for Job Hunters Today", retrieved from <http://normmurray.org/2008/02/18/corporatesocial-responsibility-is-the-number-one-criteria-for-job-hunters-today>
- [17] Nancy R L. (2004) "Corporate Social Responsibility: HR's Leadership Role December", retrieved from http://www.shrm.org/Research/quarterly/1204RQuart_essay.asp.
- [18] Raman S. R. (2006) "Corporate Social Reporting in India-A View from the Top", *Global Business Review*, Vol. 7(2): pp 313 - 24.
- [19] Redington I. (2005) "Making CSR Happen: The Contribution of People Management, Chartered Institute of Personnel and Development", retrieved from www.birc.org.uk/document.rm?id=5103
- [20] Rupp D.E., Ganapathi J., Aguilera R.V., Williams C.A (2006) "Employee Reactions to Corporate Social Responsibility: An Organizational Justice Framework", *Journal of Organizational Behavior*, 27: pp 537-43.
- [21] Sirota Survey Intelligence (2007) quoted from CSR boosts employee engagement, Social responsibility boosts employee engagement 09 May, <http://www.managementissues.com/2007/5/9/research/social-responsibility-boostsemmployee-engagement.asp>
- [22] Tripathi P.C. and Reddy P.N. (2006) "Principles of Management", Tata McGraw Hill, New Delhi: p 41.
- [23] Young M. (2006) "HR as the Guardian of Corporate Values at Cadbury Schweppes", *Strategic HR Review*, Vol.5 (2): pp 10-11.
- [24] Zappala G. and Cronin C. (2002) "The Employee Dimensions of Corporate Community Involvement in Australia: Trends and Prospects", Paper Presented at the 6th ANZTSR Conference; 27-29 November, Auckland, New Zealand, pp 1-24.

Corporate Social Responsibility—A Growing Conviction in India

Nabanita Baruah and Akanksha Singh

Lecturer (MBA), NGP College of Engineering & Technology, Palwal

Abstract—When India is making a transformational progress, the world is looking at us as one of fastest emerging economies of world. We assume that our society is also progressing at the same rate as the economy is growing or there is a gap between economic vs. social progress of the country. If society is progressing at the same pace as the economy is growing then it is a very healthy sign but if there is a mismatch between the two then it would be very grave situation since it may widen the gap between the different strata of society. When most societies are wrestling with an acceleration and intensification of social change, there is a revolution of rising expectations. But how this change will happen. There are various measures to bring about such changes in the form of war, revolution or planned way. But in India we believe in democracy, rationality and progress. But question arises whether the initiatives taken by government for social upliftment is sufficient or private players should also contribute or government, corporate and citizen's together act for this change. This paper is an attempt to answer such critical questions. An attempt would be made to find economic vs. social progress and will try to suggest how Corporate Social Responsibility can contribute. Paper would also try to highlight the existing examples of owning social responsibilities by corporate and how they have benefited through it.

Keywords: Business, Corporate Social Responsibility, Economic Progress, Social Progress

CSR—AN INTRODUCTION

“Corporate derive a lot of benefits from society it is their responsibility to give back some of that to society.”

Business depends on the society for the needed inputs like money, men and material. Business also depends on the society for the market. Thus business depends on the society for existence, sustenance and encouragement. Dependence of business on society is so complete that as long as the latter wants the former, business has reasons to exist.

A business enterprise in modern times is not only regarded as an economic institution but also as a social institution. It is expected to behave as a good neighbour which should take part in the betterment of the community and fulfilling its responsibility as a responsible citizen in a democracy. Business is therefore responsible not only for economic results but also for making social contribution. When the very existence of a business organisation depends on society it should not ignore its responsibility towards the society.

AN OVERVIEW

Giving a universal definition of corporate social responsibility is bit difficult as there is no common definition as such. However, there are few common threads that connect all the perspectives of CSR with each other; the dedication to serve the society being most important of them.

- Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.
- CSR involves addressing the legal, ethical, commercial and other expectations that the society has for business, and making decisions that fairly balance the claims of all key stakeholders. Effective CSR aims at “achieving commercial success in ways that honour ethical values and respect people, communities, and the natural environment.” Simply put it means “what you do, how you do it, and when and what you say.” Several terms have been used interchangeably with CSR. They include—business ethics, corporate citizenship, corporate accountability, sustainability and corporate responsibility
- Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at the large.

Thus, the meaning of CSR is twofold. On one hand, it exhibits the ethical behaviour that an organization exhibits towards its internal and external stakeholders (customers as well as employees). On the other hand, it denotes the responsibility of an organization towards the environment and society in which it operates.

CSR is also referred to as:

- ‘corporate’ or ‘business responsibility’
- ‘corporate’ or ‘business citizenship’
- ‘community relations’
- ‘social responsibility’.

The rationale for CSR has been articulated in a number of ways. In essence it is about building sustainable businesses, which need healthy economies, markets and communities.

THE KEY DRIVERS FOR CSR ARE

- Enlightened self-interest - creating a synergy of ethics, a cohesive society and a sustainable global economy where markets, labour and communities are able to function well together.

- Social investment - contributing to physical infrastructure and social capital is increasingly seen as a necessary part of doing business.
- Transparency and trust - business has low ratings of trust in public perception. There is increasing expectation that companies will be more open, more accountable and be prepared to report publicly on their performance in social and environmental arenas.
- Increased public expectations of business - globally companies are expected to do more than merely provide jobs and contribute to the economy through taxes and employment.”

CSR can be well understood under the three waves, which are as follows:

- a. Community engagement
- b. Socially responsible production process
- c. Socially responsible employee relations

It could be clearly analyzed under the “3 waves of CSR” that the corporate world need to shell out a part of their profit initially to tap the long run economies of scale (LREoS), be it internal or external. Beyond good intentions some of the benefits that the corporate world reaps are:

- Powerfully aligning the firms operations and social environmental “Foot print” with managements values,
- Understanding and transforming public perception of the company and industry,
- Attracting investment in the firm, sector and overall economy,
- Increased market share and new market penetration,
- Mobilizing and energizing the company’s own human capital,
- Reducing risk

In developing countries like INDIA, business can succeed only if industries maintain good relationships with all their stakeholders. These relationships can be strengthened, if organizations fulfil their obligations towards the stakeholder.

CSR: ITS RESPONSIBILITIES & OBLIGATIONS

Types of Social Responsibility in Business Organisations:

- a) Internal Social Responsibilities: Shareholders and Employees.
- b) External Social Responsibilities: Customers, Government, Suppliers, Community and the Environment.
- c) Social objectives refer to a company’s objectives and its responsibilities towards its employees, shareholders, and the public at large.
- d) Economic objectives refer to optimization of available resources for maximization of profits and to survive in the competition prevailing in the industry. Sun is named as one of the World’s Most Ethical Companies. It leads the industry in offering a portfolio of eco responsible products and services that deliver powerful, sustainable, energy-efficient computing solutions that don’t compromise on capacity and security. Eco Responsibility Initiative focus on includes efforts to shrink carbon emissions, develop an alternative-energy strategy, and otherwise reduces the environmental impact of its operations.

WHY CSR?

CSR results in the following benefit for the business in an organization.

1. Company benefits
 - Improved financial performance;
 - Lower operating costs;
 - Enhanced brand image and reputation;
 - Increased sales and customer loyalty;
 - Greater productivity and quality;
 - More ability to attract and retain employees;
 - Reduced regulatory oversight;
 - Access to capital;
 - Workforce diversity;
 - Product safety and decreased liability.
2. Benefits to the community and the general public:
 - Charitable contributions;
 - Employee volunteer programmes;
 - Corporate involvement in community education, employment and homelessness programmes.
 - Product safety and quality.
3. Environmental benefits:
 - Greater material recyclability;
 - Better product durability and functionality;
 - Greater use of renewable resources;
 - Integration of environmental management tools into business plans, including life-cycle assessment and costing, environmental management standards, and eco-labelling.

CSR: INDIA'S POSITION

The Indian business sector presents a mixed picture as far as social responsibility is concerned. J.R.D. Tata, who has been instrumental in conducting the first audit in India and perhaps in the world, is of the opinion that while on the side of production, of growth, of efficiency. Even much before the issue became a global concern, India was aware of corporate social responsibility (CSR), due to the efforts of organisations such as the Tata Group. (Around 66 per cent of Tata Sons, the holding group of the Tata Group, is today owned by a trust). Corporate companies like ITC have made farmer development a vital part of its business strategy, and made major efforts to improve the livelihood standards of rural communities. Unilever is using micro enterprises to strategically augment the penetration of consumer products in rural markets.

IT companies like TCS and Wipro have developed software to help teachers and children in schools across India to further the cause of education. In June 2008, a survey was carried out by TNS India (a research organization) and the Times Foundation with the aim of providing an understanding of the role of corporations in CSR. It is gratifying to that a number of leading companies in India have shown recognition of the social responsibility of the corporate sector. The business community has been instrumental in setting up hundreds of institutions of public service like schools, colleges, management institutes, dispensaries, hospitals, technological institutes, research institutes, libraries, dharamshalas, cultural institutions, institutes for the dumb, deaf & blind, museums & places of religious worship. Some of the leading enterprises have extended welfare measures like health & medical facilities to people of the surrounding villages. Some enterprises have taken pollution abatement measures. Many businessmen have risen up to the occasion to help the victims of droughts, floods, earthquakes & other natural calamities.

Hindustan Construction Company (HCC) plays an active role in CSR initiatives in the fields of Health, Education, Disaster Management, and Environment. Disaster Resource Network DRN is a worldwide initiative, promoted by the World Economic Forum (WEF). JCB India adopted a Government school, in the vicinity of the company premises as its social responsibility. The K. C. Mahindra Education Trust was established in 1953 by late Mr. K. C. Mahindra with an objective to promote education. The Trust has provided more than Rs. 7.5 Crore in the form of grants, scholarships and loans. It promotes education mainly by the way of scholarships. The Nanhi Kali project has over 3,300 children under it. Alambana (support) is the corporate social responsibility arm of Satyam Computer Services Limited, formed to support and strengthen the vulnerable and underprivileged sections in urban India.

Indian companies have made little progress in reporting development projects. And only 48 companies have so far given their commitment to support the United Nations Global Compact, a charter for improving the global business environment through standards, such as labour rights and fighting corruption.

Companies, too, continue to rely on different models to earmark its social expenditure, making it difficult to measure the overall impact. For instance, the Steel Authority of India Ltd (SAIL), the country's largest steel company, spent Rs100 crore on CSR last year; this was 2% of its profit after tax, exclusive of dividend tax, according to SAIL spokesperson N.K. Singhal. Yet others, such as Tata Steel Ltd, which runs an 850-bed hospital and rural projects in 800 villages around Jamshedpur, spends an average of Rs150 crore as part of its annual revenue expenditure. What eventually makes up for CSR of a company ultimately depends on leadership; as part of company decision, about 66% of Tata Sons, the holding group of the Tata group, is today owned by a trust.

CONCLUSION

It can be concluded that in today's informative world where information are readily available to general public CSR has been an important part of any organization to be successful. Organization in present world cannot be successful without taking into account the social responsibility. CSR has been a vital component for any organization to have perpetual success and to create brand. CSR cannot be an additional extra - it must run into the core of every business' ethics, and its treatment of employees and customers.

Thus, CSR is becoming a fast-developing and increasingly competitive field. The case for demonstrating corporate responsibility is getting stronger as expectations among key opinion formers, customers and the public are increasing. Being a good corporate citizen is increasingly crucial for commercial success and the key lies in matching public expectations and priorities, and in communicating involvement and achievements widely and effectively.

REFERENCES

- [1] Dsilva B., "Corporate Social Responsibility in India - An Empirical Research"
- [2] "Corporate Social Responsibility is no longer just an addition, it is a key differentiator"
- [3] CSR could prove to be a valuable asset in an age of M & As, as it helps firms spread their brand name - Maitreyee Handique.
- [4] <http://matthewalberto.com/2011/07/corporate-social-responsibility-in-india>
- [5] <http://tutor2u.net/business/strategy/corporate-social-responsibility-introduction.html>
- [6] <http://www.alliancemagazine.org/node/1259>
- [7] <http://www.csrweltweit.de/en/laenderprofile/profil/indien/index.nc.html>
- [8] http://www.indianmba.com/Faculty_Column/FC1307/FC1307a/fc1307a.html
- [9] <http://www.saycocorporativo.com/saycoUK/BU/journal/Vol2No1/article9.pdf>
- [10] <http://www.simplycsr.co.uk/what-is-sustainable-business.html>
- [11] <http://www.youthkiawaaz.com/2011/04/corporate-social-responsibility-in-india>
- [12] Prasad Chandra, CMD, BASF, South Africa.
- [13] Review "Corporate Social Responsibility Practices in India" in Times of India.

Corporate Social Responsibilities—Recent Activity by TATA Group

Abhinna Srivastava¹ and Shiddharth Kumar Rai²

¹Assistant Professor, Department of Commerce, Guru Ghasidas University, Bilaspur, C.G

²Student, PGDM, SSIM, Moradabad, U.P.

Abstract—Corporate Social Responsibility is basically a business's response to new conditions, new challenges and new opportunities (Tom Bateman, 2003). The idea of CSR is very old, and it has been successfully implemented in many of the companies at the world level and also in India. We have undertaken this study to understand the importance of CSR in not just nation building but as a strategy to successfully build up a business. We shall try to understand how the Tata group has successfully carried forward the vision of his forbearers and used it to further develop its business. Tata is a window into the rise of India. While that rise is often traced to free-market reforms that began in the early '90s, Tata executives emphasize that even now, the company grows despite obstacles thrown up by red tape and special interests. Unlike China's boom, which was orchestrated by the state, India's is primarily the story of an enterprising private sector. The United States sees India as an outsourcing economy that threatens to siphon off service jobs but India's wider potential is mirrored in the range of Tata's ambitions—from luxury hotels and jewellery to the 1 Lakh Nano cars. At Tata, "corporate social responsibility," to use the Western buzzword, has real money behind it.

Keywords: Corporate Social Responsibility, TATA Group, Development, Business Excellence.

INTRODUCTION

Tata Group is India's largest and most diversified industrial house, The Tata Group operates more than 80 companies ranging from software and automobiles to steel, consumer goods and telecommunications. With 200,000 employees across India, it is the nation's largest private employer.

The Tata Group is also unique in that nearly two thirds of the equity of the parent firm, Tata Sons Ltd., is held by philanthropic trusts endowed by Sir Dorabji Tata and Sir Ratan Tata, sons of Jamsetji Tata, who founded the family business in the 1860s. These multipurpose trusts, chaired by Ratan N. Tata, include two of the earliest and largest private grant making organizations in India. Through these trusts, Tata Sons gives away on average between 7.5 to 15 percent of its net profit every year.

A pioneer in several areas, the Tata group has consistently followed the path of innovation, growth and development. Tata is credited with pioneering India's steel industry, civil aviation and starting the country's first power plant. Tata was the market leader in several diverse fields - it had the world's largest integrated tea operation, was Asia's largest software exporter, and is the world's sixth largest manufacturer of watches (Titan).

OBJECTIVES

We have undertaken this study to understand the importance of CSR in not just nation building but as a strategy to successfully build up a business. We shall try to understand how the Tata group has successfully carried forward the vision of his forbearers and used it to further develop its business.

CSR AND THE TATA GROUP

"In a free enterprise, the community is not just another stakeholder in business but is in fact the very purpose of its existence."

Jamsetji N. Tata, Founder, Tata Group.

"Corporate Social Responsibility should be in the DNA of every organization. Our processes should be aligned so as to benefit the society. If society prospers, so shall the organization..."

Manoj Chakravarti, General Manager - Corporate Affairs and Corporate Head-Social Responsibility, Titan Industries Limited in 2004.

The guiding mission of the Tata group was stated by JRD Tata in the following words: "No success or achievement in material terms is worthwhile unless it serves the needs or interests of the country and its people."

Today's buzzword, Corporate Social Responsibility or CSR has been part of the Tata Group ever since the days of Jamshetji Tata. Even while he was busy setting up textile ventures, he always thought of his workers' welfare and requirements of the country. From granting scholarships for further studies abroad in 1892 to supporting Gandhiji's campaign for racial equality in South Africa to giving the country its first science centre, hospital and atomic research centre to providing relief and rehabilitation to natural disaster affected places - they have done it all.

From its inception, the Tata group has taken up a number of initiatives for the development of society. A unique feature of the group is that 63 percent of the equity capital of the parent firm - Tata Sons Limited - is held by Tata trusts, which are philanthropic in nature. According to a statement on the Tata group's website (www.tata.com), "The wealth gathered by Jamsetji Tata and his sons in half a century of industrial pioneering formed but a minute fraction of the amount by which they enriched the nation. Jamshed Irani, Director, Tata Sons Ltd, says, "The Tata credo is that 'give back

to the people what you have earned from them'. So from the very inception, Jamshetji Tata and his family have been following this principle." Moreover he says that for any business to sustain in the long run they have to look beyond business.

Ages ago when Corporate Social Responsibility was either the government, or charitable organizations headache, the Tata's aggressively worked for the upliftment of the community.

Tata initiated various labour welfare laws, like the establishment of Welfare Department was introduced in 1917 and enforced by law in 1948 or Maternity Benefit was introduced in 1928 and enforced by law in 1946. The group has always been recognized as a value-driven organization. The company's values were imbibed from the founder of the group and his successors who took on the leadership of the group. All the individuals who headed Tata institutions emphasized the importance of philanthropy and the utilization of wealth to enhance the quality of public life. The core values espoused by the group included integrity, understanding, excellence, unity and responsibility. The values of the founders are reflected in the mission statement of the group, which lays great emphasis on CSR.

The group's mission statement states, "At the Tata group, our purpose is to improve the quality of life of the communities we serve. We do this through leadership in sectors of national economic significance, to which the group brings a unique set of capabilities..."

Considered as pioneers in the area of CSR, the Tata group has played an active role in nation building and socio-economic development since the early 1900s. A survey conducted by the website www.indianngos.com revealed that Tatas spent Rs. 1.5 billion on community development and social services during the fiscal 2001-02 - the highest by any corporate house in India.

Even when economic conditions were adverse, as in the late 1990s, the financial commitment of the group towards social activities kept on increasing, from Rs 670 million in 1997-98 to Rs 1.36 billion in 1999-2000.

Over the recent years too as earlier, the Tata philosophy to 'Give back what you get' has been followed by all their enterprises across India. Be it relief measures, rural development, health care, education and art and culture, they have been very forthcoming. As result every year, the Tata Group's contribution to society has been phenomenal. In the fiscal year 2004 Tata Steel alone spent Rs 45 crore on social services.

Different Tata companies have been actively involved in various social works. Like Tata Consultancy Services runs an adult literacy programme, Titan has employed 169 disabled people in blue collar workforce at Hosur, Telco is fighting against Leprosy at Jamshedpur, Tata Chemicals runs a rural development programme at Okhamandal and Babrala, Tata Tea's education programme and Tata Relief Committee (TRC) which works to provide relief at disaster affected areas.

The group's policy is to provide livelihood instead of giving money. "How long can you give rice and dal? What is required is the means to live. And that is what the company does. During natural calamities there are two phases of assistance—relief measures and rehabilitation programme. After the Gujarat earthquake the group built 200 schools in two years and they rendered help during the Orissa floods when people lost cattle. Even after the Tsunami disaster members of TRC immediately reached the places and figured out what is required.

CSR AND BUSINESS STRATEGY

The Tata group has long accepted the idea that CSR makes business sense. This was realized by JN Tata way back in 1895, when he stated, "We do not claim to be more unselfish, more generous or more philanthropic than others, but we think we started on sound and straightforward business principles considering the interests of the shareholders, our own and the health and welfare of our employees... the sure foundation of prosperity."

Since inception, the Tata group has placed equal importance on maximizing financial returns as on fulfilling its social and environmental responsibilities - popularly known as the triple bottom line. After decades of corporate philanthropy, the efforts of the group in recent years have been directed towards synchronization of the Triple Bottom Line (TBL). Through its TBL initiative, the Tata group aimed at harmonizing environmental factors by reducing the negative impact of its commercial activities and initiating drives encouraging environment-friendly practices. In order to build social capital in the community, the group has got its senior management involved in social programs, and has encouraged employees to share their skills with others and work with community-based organizations...

Newly included was an article stating that the "company shall be mindful of its social and moral responsibilities to consumers, employees, shareholders, society and the local community." In another bid to institutionalize the CSR charter, a clause on this was put into the group's 'Code of Conduct.'

This clause stated that group companies had to actively assist in improving the quality of life in the communities in which they operated. All the group companies were signatories to this code. CSR was included as one of the key business processes in TISCO. CSR was one of the eight key business processes identified by TISCO's management and considered critical to the success of the company.

RECENT DEVELOPMENT

In corporate social responsibility he has given new direction and focus to the Tata Group's disparate activities with the creation of the Tata Council for Community Initiatives (TCCI) in 1996.

Named Business Man of the Year for Asia by Forbes in 2004, Mr Ratan Tata serves on the board of the Ford Foundation and the program board of the Bill & Melinda Gates Foundation's India AIDS initiative.

A July 2004 cover story in Business Week [India] quotes an investment banking source as noting that the company's challenge is to "ensure that the Tata group's sense of social obligation doesn't collide with shareholder value creation. According to Ratan Tata's view these two objectives are not incompatible. What the company has done in their discharge of social responsibility should be of value to their shareholders. Their efforts result in a more prosperous country, and lead to a greater quality of life that benefits all. Their failure to do so would contribute to a poor India with continued shortages and inequities. Companies end up supporting these societal needs, either through the costs of corporate social responsibility or taxation, so all companies pay one way or another. However, the cost is relatively small, and the benefits are relatively great. He further states that there is not much difference in his fundamental vision. His predecessors decided that their efforts would not only raise the level of the quality of life for people of India, but they would also deal in human development. None of that has changed, but the fabric of the field of work has changed with time and the demands of philanthropy in India are today both in dimension and scope in some ways more intense than they were before.

In the early days, philanthropy was about creating development institutions such as hospitals, and initiatives of a nature which at the time were more about nation building than ours are today. Today, the company's philanthropic initiatives have greater focus, for example, on creation of awareness of things like discrimination against the girl child; on microfinance, to get people away from moneylenders; on water harvesting and conservation; in moving more to small community initiatives. From their own grant giving, they have found that the greatest challenge is to find appropriate, professionally managed grantees or NGOs. It's one of our biggest problems. There are a lot of calls for money but there is often inadequate professionalism and management, which doesn't give us a lot of comfort in channelling money in that direction. More and more people are being driven by a real dedication, but they're still individuals, they still need help in creating institutions. They have recognized that those people have to be encouraged, almost cajoled, into building an organization that will survive beyond them. Philanthropic institutions in India still believe they're charitable and therefore must operate on a shoestring that creating an organization is almost a luxury. This needs to change -- they have to recognize that a nonprofit has as much responsibility for being professionally run as a corporate body. There's a tremendous need to move into grassroots levels and create savings programs in villages, education, hygiene awareness, and help for water harvesting and water conservation, but not many organizations are doing these things. The few the company has found, they support very heavily, but not all of them have the organizational strength to really grow in this area, to have a meaningful presence in the country.

Where they do operate, the results are phenomenal. Some of their water conservation grantees have transformed the areas in which they are working, and whatever they have seen there is just amazing. A number of their grantees have worked with villages -- villages starved of water that have had no livelihoods -- and with water harvesting and conservation, they've created year-round water supply and changed the entire fabric of these villages. Thanks to a partnership between the research lab of software giant Tata Consultancy Services (TCS) and a range of local NGOs, clean and safe drinking water is available for the first time for thousands of households in rural Maharashtra. These villagers are using a household water filter that relies on commonly available agricultural waste to screen out harmful pathogens, contaminants and sediments. Developed specifically for rural areas, the filter is the result of years of research and field trials by scientists at the Tata Research Development and Design Centre (TRDDC), the Pune-based R&D division of TCS. "They've been trying to bridge the divide between the IT world and the rest of India, and this has come out of that effort," explains Ratan N. Tata.

While the connection between information technology and low-tech water filters may not be obvious, the project exemplifies Tata philanthropy's emphasis on rural communities and water conservation and is squarely in keeping with TRDDC's mission to use research to transform lives. TRDDC is working with Sir Dorabji Tata Trust, the Confederation of Indian Industry and local NGOs to pursue scaling up deployment of the filter technology in various regions of the country.

One of the things Mr Ratan Tata is looking at with the Trusts is another round of building major institutions, such as his predecessors had built. Another possibility is the computer learning initiative to promote literacy for adults. Simply putting more money into the same type of programs as they have been doing is difficult, because they have problems locating and funding appropriate grantees.

Further he states that the company will keep their efforts largely at home. A few years ago, the company reactivated the Chair in development economics at the London School of Economics established by Sir Ratan Tata at the turn of the century, and they are looking at doing something similar in Indian or Asian studies in another institution outside of India. Recently he donated a huge sum to Harvard University. They are also exploring opportunities in computer based functional literacy and vocational skills in South Africa. But barring some isolated instances of this nature, their philanthropic activities will be focused mostly on India.

TBEM-STRIVING FOR BUSINESS EXCELLENCE

To ensure that Tata group companies achieved high levels of business excellence, Tata Quality Management Services (TQMS - a division of Tata Sons) had been entrusted with the task of institutionalizing the Tata Business Excellence Model (TBEM). The role of TQMS includes setting up of standards of business excellence using the TBEM framework and assisting group companies in achieving those established standards. The TBEM provides each company with an outline to help it improve business performance and attain higher levels of efficiency.

PROGRESS AND HISTORY OF BPO OPERATIONS

The BPO and IT outsourcing industry started in the late 80's mainly driven by the low-cost English speaking potential workforce of India. With huge need in the 90's due to the dot.com growth and potential Y2K bugs, India was proactive in fostering this growth and ensured that university systems could support the need for technically competent and efficient workers. In the 2000s similar patterns of growth were evident in the region as companies worked to cut costs during down cycles. There were some slowdowns however between 2008 and 2009 as much of the world was struggling with near recession challenges. Since then the industry has made resurgence and is once again growing at significant rates.

This success in outsourcing has helped India in many ways and it has also driven costs up. While still substantially less expensive than American wages there has been growth in several other countries with high amounts of English speakers, e.g., Pakistan, Indonesia and Egypt. Through 2010 this trend of success has continued. The BPO sector focusing on voice based outsourcing will generate over Rs 127 billion in revenue not including IT or Software support that many BPO organizations also support.

REVIEW OF BPO COMPANIES

Genpact

Rs 45.92 billion; Total employees-41,000; Key Leader—Pramod Bhasin (president and CEO); Growth Rate-12%: Since its inception in 1997 as the first Indian based process operations center for GE Capital it has become India's number one BPO firm in terms of revenue. They operate around the world and have offices in nine countries and 30 operations centers. With services that range from accounting, to collections and customers service Genpact has accomplished a lot in a relatively short period of time.

Genpact is the first company to focus on business outcomes and the first to use a scientific approach to deliver effectiveness as well as efficiency. With services that range from accounting to collections, Genpact provides service to a wide range of industries: oil and gas, manufacturing, transportation and logistics, retail, insurance, automotive, healthcare providers and payers, banking and financial services, and capital markets (Genpact 2010).

With the use of their global network, the company provides a seamless delivery to meet the needs of their clients goals including business objectives and cost reduction as well as cultural and language requirements. A pioneer in the Business Process Management industry, Genpact was one of the first to introduce Six Sigma for process transactions. Smart Enterprise Processes (SEP) is Genpact's creation for the management of business processes using a scientific methodology to focus on process effectiveness (Genpact 2010). With their focus on process first, Genpact believes that technology is an enabler not a driver of great processes and claims their strength comes from their deep knowledge of process. With over 5000 employees in their global analytics and research services division, they bring process efficiency and effectiveness to the table (Genpact 2010).

Genpact has kept overhead down while expanding worldwide in part from keeping its 80 member legal team as well as the majority of the IT outsourcing services in India. To strengthen its future, the company has ventured into markets in Asia, Eastern Europe, and North Africa (The Lawyer 2011).

Their current business strategy is to expand relationships with their clients, including the 29 who are part of the Fortune 100 companies. In 2010, Genpact's revenues of business process management services increased by 19% (Genpact 2010). When Genpact began, they had to negotiate the difficulties of working in an undeveloped suburb. They provided food for their staff because there were no facilities in the neighborhood. To this day the company provides transportation to 15,000 workers. From 1998 to 2001 they grew from 20 employees to 12,000. Due to the fast paced growth of the company, attrition reached almost 50%. In order to get a handle on quality, Genpact stopped growing during the year of 2001. During that time, they redoubled their training of managers, stopped hiring, and revamped all their training processes (Bhasin 2011).

Today, Genpact aggressively competes with the other India based outsourcing firms in an environment and culture that prizes academic and personal growth. Genpact's major investment is in its people. One of the programs they have implemented is called Education@Work. Genpact brings in professionals to train employees at the office and today almost 8000 of their workers are enrolled in universities around the world. Genpact's attrition rate is now 6% compared to almost 50% in some companies (Harris 2010).

Genpact has received numerous awards including "The Process Innovation Award" and "Most Consistent Business Impact Award" in 2011 as well as the "Best Performing BPO Provider" in 2009. In August of 2011, the National Association of Software and Services Companies named Genpact first place in a list of 15 BPO exporters in India. With services that range from accounting to collections and customers service Genpact has accomplished a lot in a relatively short period of time.

TCS BPO

Rs 31.42 billion; Total employees 160,429; Key Leaders Ratan Tata (chairman); N Chandrasekaran (chief executive officer); Growth Rate 73%: From a personnel perspective TCS is a leading player in the outsourcing industry. It truly offers support and service in dozens of areas with real emphasis on banking, HR outsourcing, telecom, and media. It has

The TBEM is a tool based on the Malcolm Baldrige National Quality Award. It aims to facilitate the understanding of business performance imperatives, manage planning activities and organizational learning, enhance organizational performance capabilities and the delivery of results, and recognize excellent performance and identifying and sharing best practices.

Recognition of CSR

The dedicated CSR efforts by various Tata group companies have been globally recognized. The different group companies have received several awards for their fulfilment of social responsibility. For instance, TISCO was awarded 'The Energy Research Institute (TERI) award for Corporate Social Responsibility (CSR) for the fiscal year 2002-03 in recognition of its corporate citizenship and sustainability initiatives. As the only Indian company trying to put into practice the Global Compact principles on human rights, labour and environment, TISCO was also conferred the Global Business Coalition Award in 2003 for its efforts in spreading awareness about HIV/AIDS.

CSR AS A FUTURE STRATEGY

While today eyebrows are being raised about corporate doing social work, the Tata Group feels it is the need of the hour. Thus, where in the West companies are doubtful of spending the shareholders money and corporate are considering discontinuing Corporate Social Responsibility. Says Irani, "Which is fine for them, but not for a country like India. The governments of the western world have a strong social security net so corporate can concentrate on making profits and paying taxes regularly but in this regard India still lags behind. We are far away from reaching that phase of economic development where government is solely responsible for the basic needs of the public. We don't have a social security, adequate health and education services. So till then corporate houses should fill the gaps."

Further he explains that for any establishment to be successful public support is vital. One cannot be a spike of prosperity on the sea of poverty. In any society there is one section that makes huge profits and richer than the rest which leads to disparity. Over a period of time it has been witnessed that corporations die out if they do not support the masses. Moreover, Irani proudly claims that none of the Tata Board of Directors will ever be in the list of rich people. They have a trust that accumulates the profits of the company, which are then disbursed for various social causes. "We generate wealth but personally don't get any of it. These trusts accumulate the funds and disburse accordingly," concludes Irani.

In July 2004, B. Muthuraman, Managing Director, Tata Steel Limited (TISCO), announced that in future TISCO would not deal with companies, which do not conform to the company's Corporate Social Responsibility (CSR) standards. Speaking at the annual general meeting of the Madras Chamber of Commerce and Industry, Muthuraman stated, "We will not either buy from or sell to companies that do not measure up to Tata Steel's social responsibility standards."

SUGGESTIONS

Thus, we have seen in our case that CSR is truly very important in the Indian context; given the state of underdevelopment in vast sections of the Indian Society and the success of the Tata group over the years shows that it is possible to reconcile social objectives with profitability and other corporate need to emulate this strategy and this will surely take India into the league of developed nations.

CONCLUSION

Tata is a window into the rise of India. While that rise is often traced to free-market reforms that began in the early '90s, Tata executives emphasize that even now, the company grows despite obstacles thrown up by red tape and special interests. Unlike China's boom, which was orchestrated by the state, India's is primarily the story of an enterprising private sector. The United States sees India as an outsourcing economy that threatens to siphon off service jobs but India's wider potential is mirrored in the range of Tata's ambitions—from luxury hotels and jewellery to the 1 Lakh Nano cars.

In recent years, as Tata began listing some of its affiliates on Wall Street, Americans often compared Tata to the model—conglomerate they know best: General Electric. But Tata executives, many armed with Western M.B.A.s who have all read about GE and many of their American tactics—from mass layoffs to hostile takeovers say these are violations of the Tata way. Ratan Tata says his company is not driven to grow "over everybody's dead bodies." Some 66 percent of the profits of its investment arm, Tata Sons, go to charity, and executives make clear they have no intention of relinquishing control to Wall Street. At Tata, "corporate social responsibility," to use the Western buzzword, has real money behind it.

REFERENCES

- [1] Cover story -July, 2004; Business week
- [2] Excerpts taken from Case Study: The Tata Group: Integrating Social Responsibility with Corporate Strategy; Case Code: BECG050 - IBS center for management research
- [3] Forerunners in corporate social responsibility March 16 2005 The Indian express
- [4] 'Social Responsibility Vital for Tata Steel Dealings,' The Hindu Business line, July 03, 2004.
- [5] 'Visionaries,' CSR Initiatives of Tata Group, www.indianngos.com, December 2004.
- [6] 'Tata Champions,' Tata Group, www.indianngos.com, December 2004.
- [7] Tata, Corporate Social responsibility, Milton & Milton friedman, Filed under: Business—Yazad Jal @ 7:49 am, The Indian economy Blog Oct 24 2005.

Behavioral Finance as an Analysis and Interpretation of Trading Behavior and Returns

Gaurav Bansal¹ and Neeraj Sanghi²

¹Associate Professor, R.D. Engineering College, Ghaziabad

²Associate Professor, IMS-Lal Quan, Ghaziabad

Abstract—An introduction to behavioral finance, including a review of the major works and a summary of important heuristics. Behavioral finance argues that some financial phenomena can plausibly be understood using models in which some agents are not fully rational. The field has two building blocks: limits to arbitrage, which argues that it can be difficult for rational traders to undo the dislocations caused by less rational traders; and psychology, which catalogues the kinds of deviations from full rationality we might expect to see. Elaboration of these two topics, and then present a number of behavioral finance applications: to the aggregate stock market, to the cross-section of average returns, to individual trading behavior, and to corporate finance. In some behavioral finance models, agents fail to update their beliefs correctly. In other models, agents apply Bayes' law properly but make choices that are normatively questionable. This review essay evaluates recent work in this rapidly growing field. We consider the classic objection to behavioral finance, namely that even if some agents in the economy are less than fully rational, rational agents will prevent them from influencing security prices for very long, through a process known as arbitrage. One of the biggest successes of behavioral finance is a series of theoretical papers showing that in an economy where rational and irrational traders interact, irrationality can have a substantial and long-lived impact on prices. This paper explains the "limits to arbitrage", form one of the two buildings blocks of behavioral finance.

Keywords: Behavioral finance, market efficiency, prospect theory, limits to arbitrage, Psychology and investor behavior.

INTRODUCTION

Behavioral finance is the study of the influence of psychology on the behavior of financial practitioners and the subsequent effect on markets. Behavioral finance is of interest because it helps explain why and how markets might be inefficient. The traditional finance paradigm, which underlies many of the other articles in this handbook, seeks to understand financial markets using models in which agents are "rational". Rationality means two things. First, when they receive new information, agents update their beliefs correctly, in the manner described by Bayes' law. Second, given their beliefs, agents make choices that are normatively acceptable, in the sense that they are consistent with Savage's notion of Subjective Expected Utility (SEU). This traditional framework is appealingly simple, and it would be very satisfying if its predictions were confirmed in the data. Unfortunately, after years of effort, it has become clear that basic facts about the aggregate stock market, the cross-section of average returns and individual trading behavior are not easily understood in this framework. Behavioral finance is a new approach to financial markets that has emerged, at least in part, in response to the difficulties faced by the traditional paradigm. In broad terms, it argues that some financial phenomena can be better understood using models in which some agents are *not* fully rational. More specifically, it analyzes what happens when we relax one, or both, of the two tenets that underlie individual rationality.

WHY BEHAVIORAL FINANCE CANNOT BE DISMISSED

Modern financial economic theory is based on the assumption that the "representative agent" in the economy is rational in two ways: The representative agent (1) makes decisions according to the axioms of expected utility theory and (2) makes unbiased forecasts about the future. An extreme version of this theory assumes that every agent behaves in accordance with these assumptions. Most economists recognize this extreme version as unrealistic; they concede that many of their relatives and acquaintances—spouses, students, deans, government leaders, and so on—are hopeless decision makers. Still, defenders of the traditional model argue that it is not a problem for some agents in the economy to make suboptimal decisions as long as the "marginal investor," that is, the investor, who is making the specific investment decision at hand, is rational. The argument that asset prices are set by rational investors is part of the grand oral tradition in economics and is often attributed to Milton Friedman, one of the greatest economists of the century and one of the greatest debaters of all time. But the argument has two fundamental problems. First, even if asset prices were set only by rational investors in the aggregate, knowing what individual investors are doing might still be of interest. Second, although the argument is intuitively appealing and reassuring, its adherents have rarely spelled it out carefully. Suppose a market has two kinds of investors: rational investors (rationals), who behave like agents in economics textbooks, and quasi-rational investors (quasi's), people who are trying as hard as they can to make good investment decisions but make predictable mistakes. Suppose also that two assets in this market, X and Y, are objectively worth the same amount but cannot be transformed from one into the other. Finally, assume that the quasi's think X is worth more than Y, an opinion that could change (quasi's often change their minds) while the rationals know that X and Y are worth the same. What conditions are necessary to assure that the prices of X and Y will be the same, as they would be in a world with only rational investors?

This question is complex, but some of the essential conditions are the following. First, in dollar-weighted terms, such a market cannot have too many quasi's (in order for the rational investors to be marginal). Second, the market must allow costless short selling (so that if prices get too high, the rationals can drive them down). Third, only rational investors can sell short; otherwise, the quasi's will short *Y* when the two prices are the same because they believe *X* is worth more than *Y*. The result would be no equilibrium. Fourth, at some date *T*, the true relationship between *X* and *Y* must become clear to all investors. Fifth, the rationals must have long horizons, long enough to include date *T*. These conditions are tough to meet. Consider the example of the Royal Dutch/Shell Group, as documented in Rosenthal and Young (1990) and Froot and Dabora (1999). Royal Dutch Petroleum and Shell Transport are independently incorporated in, respectively, the Netherlands and England. The current company emerged from a 1907 alliance between Royal Dutch and Shell Transport in which the two companies agreed to merge their interests on a 60/40 basis. Royal Dutch trades primarily in the United States and the Netherlands and is part of the S&P 500 Index; Shell trades primarily in London and is part of the Financial Times Stock Exchange Index. According to any rational model, the shares of these two components (after adjusting for foreign exchange) should trade in a 60–40 ratio. They do not; the actual price ratio has deviated from the expected one by more than 35 percent. Simple explanations, such as taxes and transaction costs, cannot explain the disparity.

Why don't rational investors intervene to force the shares of Royal Dutch/Shell back to their rational 60–40 ratio? The answer is that hedge funds do make investments based on this disparity: They buy the cheaper stock and short the more expensive one. Indeed, Royal Dutch/Shell is one of many such investments Long-Term Capital management had in place in the summer of 1998. In August 1998, when things started to unravel for LTCM, the Royal Dutch/Shell disparity was relatively large, so at a time when LTCM might have chosen to increase the money it was willing to bet on this anomaly, it had to cut back instead. Shleifer and Vishny (1997) envisioned this scenario in their article explaining the "Limits of Arbitrage." The lesson from this example is that even when the relationship between two prices is easy to calculate and fixed by charter, prices can diverge and arbitrageurs are limited in their ability to restore the prices to parity. What, then, are the prospects for prices to be rational in more-complex settings? Take the case of Internet stocks. Many, if not most, professional analysts believe that the valuations of Internet stocks are too high. In surveys of professional investors that I conducted in the spring of 1999, the median respondent thought that the intrinsic value of a portfolio of five Internet stocks (America Online, Amazon.com, eBay, Priceline.com, and Yahoo!) was 50 percent of the market price. Suppose the "professionals" are right and these multibillion dollar companies are worth only half of their current prices. Suppose further that this valuation is the consensus of Wall Street experts. How can such a situation exist? The answer is that it may be equilibrium (although not a "rational equilibrium") as long as the Wall Street experts are not the marginal investors in these stocks. If Internet stocks are primarily owned by individual investors, Wall Street pessimism will not drive the price down because the supply of short sellers will then be too limited. Although some hedge funds are willing to bet on convergence for the Royal Dutch/Shell disparity, few are willing to bet on the demise of the Internet frenzy, or at least too few to cause it to happen. The analysis of Internet stocks applies with even greater force to the current level of the U.S. stock market. The consensus on Wall Street (and on similar streets around the world) is that the U.S. stock market is 20–30 percent overvalued; yet, prices can continue to increase because the investors who are willing to bet on a decline have too few dollars to prevail. First, in the U.S. market, the largest investors—pension funds, endowments, and wealthy individuals—typically use some rule of thumb for asset allocation, such as 60 percent in equities, and are thus relatively insensitive to the level of asset prices. Second, such insensitivity is even more characteristic of individual investors in 401(k) plans, who rarely rebalance their portfolios.

EVIDENCE THAT SHOULD WORRY EFFICIENT MARKET ADVOCATES

The previous section showed that the premise of behavioral finance—that cognitive biases may influence asset prices—is at least theoretically possible. But is it worth the trouble? What is the evidence that existing models cannot do the job? Surely the Royal Dutch/Shell example, although striking, is not by itself enough to undermine the rational efficient market paradigm that has served the field well for so long. I will briefly discuss five areas in which behavior in the real world seems most at odds with the theories in textbooks.

Volume

Standard models of asset markets predict that participants will trade very little. The reason is that in a world where everyone knows that traders are rational (I know that you are rational, you know that I am rational, and I know that you know that I am rational), if I am offering to buy some shares of IBM Corporation and you are offering to sell them, I have to wonder what information you have that I do not. Of course, pinning down exactly how little volume should be expected in this world is difficult, because in the real world people have liquidity and rebalancing needs, but it seems safe to say that 700 million shares a day on the NYSE is much more trading than standard market models would expect. Similarly, the standard approach would not expect mutual fund managers to turn over their portfolios once a year.

Volatility

In a rational world, prices change only when news arrives. Since Robert Shiller's early work was published in 1981, economists have realized that aggregate stock prices appear to move much more than can be justified by changes in

intrinsic value (as measured by, say, the present value of future dividends). Although Shiller's work generated long and complex controversy, his conclusion is generally thought to be correct: Stock and bond prices are more volatile than advocates of rational efficient market theory would predict.

Dividends

Modigliani and Miller (1958) showed that in an efficient market with no taxes, dividend policy is irrelevant. Under the U.S. tax system, however, dividends are taxed at a higher rate than capital gains and companies can make their taxpaying shareholders better off by repurchasing shares rather than paying dividends. This logic leaves us with two major puzzles, one about company behavior and the other about asset prices. Why do most large companies pay cash dividends? And why do stock prices rise when dividends are initiated or increased? Neither question has any satisfactory rational answer.

The Equity Premium Puzzle

Historically, the equity premium in the United States and elsewhere has been huge. For example, a dollar invested in U.S. T-bills on January 1, 1926, would now be worth about \$14; a dollar invested in large-cap U.S. stocks on the same date would now be worth more than \$2,000. Although one would expect returns on equities to be higher, because they are riskier than T-bills, the return differential of 7 percent a year is much too great to be explained by risk alone (Mehra and Prescott 1985).

Predictability

In an efficient market, future returns cannot be predicted on the basis of existing information. Thirty years ago, financial economists thought this most basic assumption of the efficient market hypothesis was true (Fama 1970). Now, everyone agrees that stock prices are at least partly predictable (see, for example, Fama 1991) on the basis of past returns, such measures of value as price-to-earnings or price-to-book ratios, company announcements of earnings, dividend changes, and share repurchases and seasoned equity offerings. Although considerable controversy remains about whether the observed predictability is best explained by mispricing or risk, no one has been able to specify an observable, as opposed to theoretical or metaphysical, risk measure that can explain the existing data pattern (see, for example, Lakonishok, Shleifer, and Vishny 1994). Furthermore, the charge that these studies are the inevitable result of data mining is belied by the fact that the authors have covered every important corporate announcement that a company can make. Academics have not selectively studied a few obscure situations and published only those results. Rather, it seems closer to the truth to say that virtually every possible trigger produces apparent excess returns. What should one conclude from these and other empirical facts? On one side of the coin is my own conclusion: In many important ways, real financial markets do not resemble the ones we would imagine if we only read finance textbooks. On the other side of the coin is the compelling evidence that markets are efficient: the performance of active fund managers. Many studies have documented the underperformance of mutual fund managers and pension fund managers relative to passive investment strategies (see, for example, Malkiel 1995). Furthermore, although there are always some good performers, good performance this year fails to predict good performance the following year, on average (see, for example, Carhart 1997). These cold facts should be kept firmly in mind when evaluating market efficiency. Regardless of the results of academic studies reporting apparently successful trading rules, real-world portfolio managers apparently have no easy time beating the market. This brief discussion of some of the empirical literature should leave the reader with a mixed impression. Market behavior often diverges from what we would expect in a rational efficient market, but these anomalies do not create such large profit opportunities that active fund managers as a group earn abnormal returns. No inherent contradiction exists in this combination of facts, although economists have often been confused on this point. A drunk walking through a field can create a random walk, despite the fact that no one would call his choice of direction rational. Still, if asset prices depended on the path the drunk adopted, it would be a good idea to study how drunks navigate.

WHAT WE HAVE LEARNED

So far, I have been considering whether behavioral finance is a worthy endeavor on a priori grounds. My conclusion, unsurprising given the source, is that we can enrich our understanding of financial markets by adding a human element. Some researchers have been at this task for quite a while, however, so it is reasonable to ask whether any real progress has been made. Perhaps the most important contribution of behavioral finance on the theory side is the careful investigation of the role of markets in aggregating a variety of behaviors. The second generation of this kind of theorizing has recently begun.

Three teams of authors (Barberis, Shleifer, and Vishny 1998; Daniel, Hirshleifer, and Subrahmanyam 1998; Hong and Stein forthcoming) have undertaken the task of generating asset-pricing models to explain the puzzling pattern of empirical results from the last decade—in particular, returns that exhibit under-reaction in the short run and overreaction in the long run.⁶ All three studies draw on results from psychology to motivate the behavior of the agents in their models. At the very least, these works serve as “existence proofs” for behavioral finance theorizing. That is, they show that it is possible to create a coherent theoretical model, one grounded in solid psychology and economics that can explain a

complex pattern of empirical results. At the moment, no rival non-behavioral model can say the same. Progress has also been made in understanding the equity premium puzzle by using psychological concepts.

Benartzi argued that the equity premium can be explained by a combination of behaviors called "myopic loss aversion." Loss aversion refers to the observed tendency for decision makers to weigh losses more heavily than gains; losses hurt roughly twice as much as gains feel good. He added the adjective "myopic" because even investors with long-term horizons appear to care about short-term gains and losses. He found that if investors evaluate their portfolios once a year, loss aversion can explain much of the equity premium.

Barberis, Huang, and Santos (1999) extended this idea in an ambitious new approach. They tried to explain the equity premium within a full equilibrium model that incorporates consumption as well as returns. They could do so only by adding another behavioral factor: the "house money effect." The house money effect captures the intuition that when gamblers are ahead (playing with what they refer to as the "house's money"), they become less loss averse and more willing to take risks. Similarly, investors who have recently earned high returns will be less risk averse. On the empirical side, much of the effort of behavioral researchers has been in uncovering new anomalies that cause us to think hard about market efficiency. Of course, these studies also create controversy because the implications of the results are subject to interpretation. One branch of empirical behavioral research should be uncontroversial: the investigation of what individual investors do with their money. Even if individuals' actions have no effect on prices, understanding how well individuals manage their portfolios is certainly useful to investors and investment professionals. Because data about individual behavior are hard to come by, such research is less common than the usual tape-spinning exercises with CRSP and Compustat, but some data are starting to emerge. Terrance Odean has managed to get a data set of trades made by some customers of one large discount brokerage firm. His research so far has shown that important behavior documented by psychologists in the lab, such as overconfidence and loss aversion, is also displayed by individuals managing their portfolios. Odean found that individuals trade too much (overconfidently thinking that they can pick winners, whereas the stocks they buy do worse than the stocks they sell) and are reluctant to sell losers (and mentally "declare" the loss), even though tax considerations should make them prefer selling a loser to selling a winner (Odean 1998). Another important set of individual investors, in addition to those studied by Odean, is those who invest in plans where they work. A large and rapidly growing pot of money is being managed by individuals who, for the most part, have little or no knowledge about investing. Benartzi has recently studied one aspect of this group's decision making—diversification strategies.

He found that many investors appear to use simple rules of thumb to invest their money, including what we refer to as the "1/n heuristic": If a plan contains n funds, allocate contributions evenly among the n funds. He found that when plans add a stock fund, allocation to equities rises. As the public debates the pros and cons of privatizing some or all of the Indian Social Security system, we will need to know more about how participants will take on the task of investing their retirement savings.

WHAT'S NEXT: A WISH LIST?

Forecasting the future is always difficult, and the only prediction in which I have complete confidence is that behavioral finance will be dominated by young scholars who are not burdened with large investments in the old paradigm (even economists have trouble ignoring sunk costs). So, instead of predicting what kinds of research will appear in the next decade, I offer a wish list of topics that I would like to see studied. First, I would like to see the theory papers discussed previously come to grips with institutions. Most of the anomalies that receive attention in the academic literature are stronger for small- and midcap stocks than for large-cap stocks. For large-cap stocks, there seem to be more anomalies on the short side than on the long side. Why? I believe that the answer depends on limits-of-arbitrage arguments, but some of the institutional barriers, such as those regarding short selling, may also have behavioral explanations. Bringing institutions more directly into the behavioral model and applying the behavioral model to institutions will be hard but worth doing.

Second, I would like to see more behavioral finance research in the field of corporate finance. Most of the research so far has been in the field of asset pricing; much less has been done on corporate finance—at least recently. My favorite corporate finance paper is John Lintner's 1956 study of dividend policy. Lintner took an unusual tack for an academic—talking to executives about how they set dividend policy. After listening, he composed a very simple model in which companies move their dividends toward a desired payout ratio while being careful to avoid the necessity of ever cutting the dividend. To this day, his model remains an accurate description of dividend policy. One example of the kind of research that it might be possible to do in the realm of behavioral corporate finance is Jeremy Stein's (1996) article "Rational Capital Budgeting in an Irrational World." Stein ponders how companies should make investment decisions if asset prices are not set rationally. Many other papers, both theoretical and empirical, are waiting to be written in this important area. Finally, I wish for more data on individual investors to become available. I hope someday soon a scholar will acquire a data set for online traders and day traders. Until such data become available, we will never fully understand what I think will become known as the Great Internet Stock Bubble. Similarly, tracking the behavior of investors in 401(k)-type pension plans is of growing importance.

THE END OF BEHAVIORAL FINANCE

Behavioral finance is no longer as controversial a subject as it once was. As financial economists become accustomed to thinking about the role of human behavior in driving stock prices, people will look back at the articles published in the past 15 years and wonder what the fuss was about. I predict that in the not-too-distant future, the term “behavioral finance” will be correctly viewed as a redundant phrase. What other kind of finance is there? In their enlightenment, economists will routinely incorporate as much “behavior” into their models as they observe in the real world. After all, to do otherwise would be irrational. Heuristic concerns ‘goodness’ and ‘badness’. Affective responses to a stimulus occur rapidly and automatically: note how quickly you sense the feelings associated with the stimulus words treasure or hate. Availability is a cognitive heuristic in which a decision maker relies upon knowledge that is readily available rather than examine other alternatives or procedures. The similarity heuristic leads us to believe that ‘like causes like’ and ‘appearance equals reality’. The heuristic is used to account for how people make judgments based on the similarity between current situations and other situations or prototypes of those situations.

CONCLUSION

Behavioral finance is a young field, with its formal beginnings in the 1980s. Much of the research we have discussed was completed in the past five years. Where do we stand? Substantial progress has been made on numerous fronts.

Empirical Investigation of Apparently Anomalous Facts

When De Bondt and Thaler’s (1985) paper was published, many scholars thought that the best explanation for their findings was a programming error. Since then their results have been replicated numerous times by authors both sympathetic to their view and by those with alternative views. At this stage, we think that most of the empirical facts are agreed upon by most of the profession, although the interpretation of those facts is still in dispute. This is progress. If we all agree that the planets do orbit the sun, we can focus on understanding why.

Limits to Arbitrage

Twenty years ago, many financial economists thought that the Efficient Markets Hypothesis had to be true because of the forces of arbitrage. We now understand that this was a naive view, and that the limits to arbitrage can permit substantial mispricing. It is now also understood by most that the absence of a profitable investment strategy does not imply the absence of mispricing. Prices can be very wrong without creating profit opportunities.

Understanding Bounded Rationality

Thanks largely to the work of cognitive psychologists such as Daniel Kahneman and Amos Tversky, we now have a long list of robust empirical findings that catalogue some of the ways in which actual humans form expectations and make choices. There has also been progress in writing down formal models of these processes, with prospect theory being the most notable. Economists once thought that behavior was either rational or impossible to formalize. We now know that models of bounded rationality are both possible and also much more accurate descriptions of behavior than purely rational models.

Behavioral Finance Theory Building

In the past few years there has been a burst of theoretical work modelling financial markets with less than fully rational agents. These papers relax the assumption of individual rationality either through the belief formation process or through the decision-making process. Like the work of psychologists discussed above, these papers are important existence proofs, showing that it is possible to think coherently about asset pricing while incorporating salient aspects of human behavior.

Investor Behavior

We have now begun the important job of trying to document and understand how investors, both amateurs and professionals, make their portfolio choices. Until recently such research was notably absent from the repertoire of financial economists.

This is a lot of accomplishment in a short period of time, but we are still much closer to the beginning of the research agenda than we are to the end. We know enough about the perils of forecasting to realize that most of the future progress of the field is unpredictable. Still, we cannot resist venturing a few observations on what may be coming next.

First, much of the work we have summarized is narrow. Models typically capture something about investors’ beliefs, or their preferences, or the limits to arbitrage, but not all three. This comment applies to most research in economics, and is a natural implication of the fact that researchers are bloodedly rational too. Still, as progress is made, we expect theorists to begin to incorporate more than one strand into their models.

An example can, perhaps, illustrate the point. The empirical literature repeatedly finds that the asset pricing anomalies are more pronounced in small and mid-cap stocks than in the large cap sector. It seems likely that this finding reflects limits to arbitrage: the costs of trading smaller stocks are higher, keeping many potential arbitrageurs uninterested. While this observation may be an obvious one, it has not found its way into formal models. We expect investigation of the interplay between limits to arbitrage and cognitive biases to be an important research area in the coming years.

Second, there are obviously competing behavioral explanations for some of the empirical facts. Some critics view this as a weakness of the field. It is sometimes said that the long list of cognitive biases summarized in Section 3 offer behavioral modelers so many degrees of freedom that anything can be explained. We concede that there are numerous degrees of freedom, but note that rational modelers have just as many options to choose from. As Arrow (1986) has forcefully argued, rationality *per se* does not yield many predictions. The predictions in rational models often come from auxiliary assumptions.

REFERENCES

- [1] Banerjee, A., V. (2002). "A Simple Model of Herd Behavior. *The Quarterly Journal of Economics*", 107(3), pp 797–817.
- [2] Barber, B., M., and Terrance O., (2009). "Boys Will be Boys: Gender, Overconfidence, and Common Stock Investment." *The Quarterly Journal of Economics*, 116(1), pp261–292.
- [3] Basu, S. (2007). "The relationship between earnings yield, market value and return for NYSE common stocks: further evidence", *Journal of Financial Economics* 12: pp129–156.
- [4] Jegadeesh, N., and Titman S. (2009). "Returns to buying winners and selling losers: implications for stock market efficiency", *Journal of Finance* 48: pp 65–91.
- [5] Michaely, R., Thaler, R. H. and Womack., K. (2005) "Price Reactions to Dividend Initiations and Omissions: Overreaction or Drift?" *Journal of Finance*, vol. 50, no. 2 (June): pp573–608.
- [6] Miller, M.H. 2008. "Behavioral Rationality in Finance: The Case of Dividends," *Journal of Business*, vol. 59, no. 4 (October):S pp 451–S468.
- [7] Modigliani, F., and Miller, M.H. (2008). "The Cost of Capital, Corporate Finance, and the Theory of Investment." *American Economic Review*, vol. 48, no. 3 (June): pp655–669.
- [8] Modigliani, F., and Cohn, R. (1999), "Inflation and the stock market", *Financial Analysts Journal* 35: pp24–44.
- [9] Mehra, R., and E. Prescott (2005), "The equity premium: a puzzle", *Journal of Monetary Economics* 15: pp145–161.
- [10] Vuolteenaho, T. (2002), "What drives firm-level stock returns?", *Journal of Finance* 57: pp233–264.

A Functional Analysis of Integrated Risk Management

Gaurav Bansal¹ and Neeraj Sanghi²

¹Associate Professor, R.D. Engineering College, Ghaziabad

²Associate Professor, IMS-Ghaziabad

Abstract—This paper is designed as a risk management briefing for senior corporate leaders. It explains the integrated risk management framework, emphasizing the links among three fundamental ways a company can apply its risk management objectives:

1. Transforming the firm's operations.
2. Modify its capital structure.
3. Employing targeted financial tool.

"Integration" refers both to the mixture of these three risk management techniques, and to the aggregation of all risks faced by the firm. This paper offers a functional analysis of integrated risk management using a wide set of descriptive situations to show how the risk management process influences, and is influenced by, the overall business behavior and the approach of the firm. Finally, the paper provides a risk management framework for inventing and designing a risk management system for the firm, concluding with a viewpoint on the future advancement of risk management.

Keywords: Risk Perception, Financial Cost, Performance Evaluation, Derivatives and Financial Instruments.

INTRODUCTION

"Integrated risk management" is the identification and assessment of the collective risks that affect firm value, and the implementation of a firm-wide strategy to manage those risks. For some managers, "risk management" immediately evokes thoughts of "derivatives," and strategies that magnify, not reduce, risk. Derivatives, as a risk management tool, are only a small part of the integrated risk management process. Moreover, a proper risk management strategy does not involve speculation, or betting on the future price of oil, corn, currencies, or interest rates, and indeed is antithetical to such speculation. Instead, the goal of integrated risk management is to maximize value by shaping the firm's risk profile, shedding some risks, while retaining others.

Companies have three fundamental ways of implementing risk management objectives:

- Modifying the firm's *operations*
- Adjusting its *capital structure*
- Employing *targeted financial instruments* (including derivatives)

Integrated risk management is by its nature "strategic," rather than "tactical." Tactical risk management, currently more common, has a narrower and more limited focus. It usually involves the hedging of contracts or of other explicit future commitments of the firm such as interest rate exposures on its debt issues.

IS THE DERIVATIVES, AS A RISK MANAGEMENT TOOL?

Exchange rate risk is, of course, only one potential risk a firm faces. Managers using an integrated risk management approach must depart from the standard practice of viewing each risk in isolation. Instead, managers must devise a strategy to respond to the full range of risks a firm faces, taking into account that a risk management policy designed solely to respond to exchange rate risk may have other, unintended, consequences on the firm's other business operations.

By applying integrated risk management, managers will benefit from new insights about the interplay among different types of risk and traditional financial decision areas, connections easily missed without a comprehensive framework. Because the three ways to manage risk are functionally equivalent in their effect on risk, their use connects seemingly-unrelated managerial decisions. For instance, because capital structure is one component of a firm's risk management strategy, effective capital structure decisions cannot be made in isolation from the firm's other risk management decisions. Consequently, a firm's capital structure choice is inextricably linked to its capital expenditure plans, along with many other operational decisions.

There are those that question whether firm-wide risk management can add value to the firm. Certainly in the hypothetical Modigliani-Miller world of corporate finance, neither capital structure choices nor corporate risk management affects the value of the firm. Indeed, if there were no value added, then direct expenses and distraction of management's attention would make risk management a negative net-present-value proposition for the firm.

HOW RISK MANAGEMENT FOR THE FIRM ADDS VALUE: UNDERSTANDING AND MEASURING ITS BENEFITS

A cascade of basic decisions about objectives faces the manager who seeks to implement a risk management program. Is the goal of the program to reduce earnings fluctuations, or to reduce fluctuations in firm value? Should the firm fully hedge its risk exposures, or only partially hedge them? Should it hedge only the downside risk, while retaining the upside

(as with an option or more traditional insurance contract)? Or should it hedge both the downside and the upside (as a forward contract would permit)? None of these questions can be answered in the abstract, because the answers will vary from firm to firm. Still, the fundamental goal of risk management is unambiguous: As with the other facets of firm management, the goal of risk management is to maximize shareholder value. Having the capability to reduce risks does not automatically imply that the firm *should* reduce its risk. Because the benefits (and costs) of risk management vary by firm, a risk management strategy must be tailored to the individual company. For some firms, targeting a particular level of earnings fluctuations will increase the value of the firm. For other firms, the value maximizing strategy is to target a particular level of fluctuations in market value of the firm or shareholder equity.

Risk Management by the Firm can Facilitate Risk Management by the Firm's Equity Holders

Financial theory distinguishes between *systematic* (market or beta) risk, and *total* risk. Investors can reduce the amount of total risk they bear by diversifying their holdings. Systematic risk is the risk that remains after such diversification is fully utilized. If such diversification opportunities are widely available to investors, systematic risk is the only risk for which investors must be compensated with a risk premium. By definition, diversification, by either the firm or its investors, cannot reduce systematic risk. Investors can control their exposures to systematic risk by adjusting the mix of risky asset and safe cash holdings or by using futures, forwards, or swap contracts. By holding a larger fraction of cash or hedging with futures, forwards and swaps, investors decrease their systematic risk exposures, but at the cost of decreasing expected returns. The availability of these targeted financial instruments greatly enhances the efficiency of investors in managing systematic risk exposures for themselves, *provided* however that they know the firm's risk exposures.

Risk Management by the Firm Can Create Value in Ways that Investors Cannot Duplicate for Themselves

Even if the firm's operations were fully transparent and unchanging, and investors *could* manage risk just as cheaply and easily as managers, firm-level risk management can *nevertheless* create substantial shareholder value in ways that risk management by outside investors cannot. Specifically, firm-based risk management can increase shareholder wealth by reducing the costs associated with financial distress, moderating the risk faced by important non-diversified investors, decreasing taxes, reducing monitoring costs, and lowering the firm's funding costs.

Risk Management can Increase Firm Value by Decreasing Financial Distress Costs

Risk management has the potential to increase firm value through several channels. First, and most importantly, by reducing the firm's total risk, risk management makes financial distress less likely. Although it had a reputation for good technology, financial distress greatly hobbled Thinking Machine's ability to compete in the lucrative market for banking and retailing supercomputer software. Intel and IBM entered that business, luring customers away from smaller and less stable companies like Thinking Machines. The potential destructiveness of financial distress is not limited to technology firms. Retailers, for example, rely heavily upon their suppliers for financing. These suppliers, in turn, regulate their own risk exposures through their selection of customers, and tend to respond rapidly to changes in customer creditworthiness.

Risk Management Can add Value by Lowering the Risk Faced by Important Non-Diversified Investors

Another way that risk management can add value is by lowering the risk faced by managers who have most of their wealth invested in their company's stock. The dramatic increase in stock and option-based compensation, and the long-running bull market, has created tremendous "paper" wealth for managers, in the form of stock and options in their firms. Without the ability to diversify their holdings, however, managers find that the value of their personal wealth fluctuates in tandem with their company's equity. Such fluctuations can be substantial, and especially so in highly volatile technology stocks, where, ironically enough, stock and option compensation reigns supreme. By reducing firm risk, risk management lowers the risk faced by managers.

Risk Management can Increase Firm Value by Reducing Taxes

Risk management also creates value by reducing a firm's tax burden. A progressive tax structure gives firms an incentive to smooth earnings to minimize taxes, and risk management enables such smoothing. It also increases a firm's debt capacity, thereby capturing the incremental tax shield associated with that debt. Specifically, if tax rates rise as income increases, a firm should smooth earnings to minimize taxes. That is, progressive tax rates mean that a firm will do better by trying to stay consistently in the lower tax-rate region, rather than have negative earnings one year, and earnings that result in a higher tax rate the following year.

As a practical matter, the "penalty" for volatility in taxable earnings is even greater than in the preceding example, whenever the ability of a firm to carry its losses forward or backward are limited. For instance, if a firm has negative earnings for an extended period of time, it may never have enough positive earnings to offset its losses and use its tax credits. Hence, smooth earnings help to reduce taxes. Through risk management, a firm can smooth its earnings and reduce its tax bill. Risk management can also decrease the firm's taxes by increasing its debt capacity.

Risk Management can Lead to Easier and Better Performance Evaluation, Thereby Reducing External Monitoring Costs and Consequently, the Firm's Capital Costs

The benefits of having a target risk exposure extend beyond the investors' ability to manage risk exposures. Risk targeting can lower the costs of monitoring and evaluating firm performance for investors, creditors, and customers. Performance evaluation requires a measure of the firm's risk in order to construct an appropriate benchmark for gauging performance. The financial-services industry is one in which risk-exposure targeting can be particularly valuable. The asset and liability portfolios of banks, securities firms, and insurance companies are typically quite opaque to outsiders. Furthermore, relative to most nonfinancial firms, these firms have the ability to change the compensation of their assets and liabilities rapidly without public detection, suggesting that an efficient way for investors to manage their risk is for the firm to target a specific risk level. Of course, the high leverage typical in this industry can mean that firm performance is very sensitive to estimate of how much risk the firm took to achieve those returns.

Risk Management Can add to Firm Value by Providing Internal Funding for Investment Projects

Under certain conditions, a firm may find it costly to raise outside funds for an investment project. Consider, for example, a research and development project for which managers have private information about the likelihood of the project's success. When the managers' private information is positive, the information disparity between managers and other market participants means that the firm's equity will be undervalued. When the managers' private information is negative, the equity will be overvalued. If the firm's equity is undervalued by the market *and* managers cannot credibly convey their positive information about the project's outcome to investors (perhaps for competitive reasons, they cannot release enough information), issuing new equity will be costly. Investors will pay less for the firm's equity than is warranted by the project's true value, because they have lower expectations about the project's outcome, then if those expectations were conditioned on management's information. If an undervalued firm needs funding for a potentially profitable project, and issuing debt is not feasible or is too expensive, then to avoid issuing equity at a discount, the firm must fund the project internally for the project to go forward. Internal funding requires that the firm either stockpile cash, or have steady cash flows from other projects. One way that risk management can be valuable for such a firm is that it can smooth out cash flow volatility, helping to ensure that the firm will be able to fund profitable projects internally. Again, the benefit of internal funding will vary from firm to firm, but the larger the information gap between managers and investors, the greater the potential for undervalued equity. Ex ante, one would expect that larger firms are relatively unlikely to suffer from such an information asymmetry between managers and investors. Larger firms are more likely to have greater analyst coverage than smaller firms, perhaps reducing the probability of asymmetric information problems. Larger firms are also less likely than smaller firms to be capital constrained. Consequently, the value of using risk management to secure internal funding might be greater for smaller, more specialized firms. Internal funding, however, can be a double-edged sword. External funding of an investment project will ordinarily entail an outside review and assessment of the firm's investment project. This "extra" review can sometimes provide managers with useful information about the prospective investment's prospects.

A FUNCTIONAL APPROACH TO INTEGRATED RISK MANAGEMENT

The integrated risk management approach recognizes that a firm has many ways to manage its risk, and that both the optimal amount of risk retained, and the tools used to achieve that level of risk will differ from firm to firm. What integrated risk management provides is a systematic way of thinking about risk and identifying its multi-dimensional effects on the firm, coupled with a framework for deciding upon the best strategy for implementation.

"Integration" means integration of risks and integration of ways to manage risk

Integrated risk management evaluates the firm's total risk exposure, instead of a partial evaluation of each risk in isolation, because it is the total risk of the firm which typically "matters" to the assessment of the firm's value and of its ability to fulfill its contractual obligations in the future. This netting can significantly reduce transaction costs. Considering the firm's total risk exposure from all sources, however, saves more than transaction costs. Such an analysis is essential in charting an effective risk management strategy. By focusing narrowly on one specific risk, the manager may create or exacerbate other types of risk for the company. Such interactions between risks are not always obvious, especially when they occur among unrelated businesses within the firm.

Tools for Integrated Risk Management: Managing Risk using Operations, Targeted Financial Instruments, and Capital Structure

At the foundation of risk management is the integration of the ternary mechanisms to alter the firm's risk profile. These three ways to manage risk, by modifying the firm's operations, by adjusting its capital structure, and by employing targeted financial instruments, interact to form the firm's risk management strategy. Managers must weigh the advantages and disadvantages of any particular approach in order to find an optimal mix of the three. As in the preceding section, we explore each of these mechanisms in a series of examples.

www.excelpublish.com

operations in 42 countries and has more than 155 offices across the globe with over 214,000 IT consultants (TCS 2012). It has its main office in Bengaluru but has branches also in Mumbai, Hyderabad, Pune and Lucknow.

With revenue of over \$8.2 billion as of March 2011 (TCS 2012), TCS is a global player in the business products outsourcing industry. India remains the company's strategic delivery center, but the company has recently expanded to include centers in Hungary, Brazil, Chile, Uruguay, and China (Datamonitor 2011). In 2009, TCS opened a development center in Orissa with 7000 seats, a center in Uttar Pradesh with 1500 seats and also opened centers in Mexico and Argentina. These provide opportunities for more growth and a revenue base that is diverse. The expanded global presence will help to offset economic downturns in other regions (Datamonitor 2011). With an attrition rate of 11.8%, TCS has not reached the pinnacle of Genpact but it has surpassed Wipro and HCL when it comes to strong employee management skills and this provides the company with a competitive advantage (Datamonitor 2011).

As the healthcare IT spending is expected to grow worldwide, TCS has already shown a strong presence in this sector with 2010 revenues from its Life Sciences and Healthcare division at 6% of the company's total revenues. The company's Engineering and Industrial Services division provided 5% of the total revenues in 2010. As Engineering Research and Development outsourcing grows, TCS is poised to take advantage of this new and expanding market (Datamonitor 2011).

TCS must compete in regional and global markets that are highly competitive. The exchange rate fluctuations are also a major concern for TCS as it generates most of its revenues in foreign currencies. Almost 62% of its IT service revenue comes for the US and the European segment accounts for 29%. The intense competition and the volatility of the US and European markets are the company's biggest threats (Datamonitor 2011).

Everest Group announced TCS as a leader in Application Outsourcing in January 2012. They contributed the ranking to TCS's strong customer base, extensive portfolio of capital markets AO delivery, and its partnerships with capital market technology vendors. Amneet Singh, VP of Everest Group stated "TCS is the largest among major offshore AO providers examined in our research and a true industry leader with a strong focus on BFSI and an impressive product portfolio as well as robust technology vendor partnerships." (Business Standard 2012).

Wipro BPO

Rs 21.06 billion; Total Employees 112,000; Key Leaders – Azim Premji (chairman); Girish Paranjpye (joint chief executive officer); Suresh Vaswani (joint chief executive officer); Growth Rate 15%: Wipro has taken aggressive measures over the last decade to grow its market share across India; one of its most aggressive steps was the purchase of Spectramind in 2002. With a balanced portfolio in both technology support and BPO solutions Wipro has positioned itself well. The majority of its operations are in India and Eastern Europe where they operate 10 different locations that support client from across the globe working in everything from telecom to healthcare.

Starting out in 1945 as a vegetable oil manufacturer, the company was known as Western India Products Limited, a producer of sunflower oil, soaps, and other consumer products. Today, Wipro works with 150 of the Fortune 500 businesses and employs over one hundred thousand employees in 72 delivery centers around the world. (WIPRO 2012). Wipro is the second largest IT services provider in India and grew 21% in the second quarter of 2011. The company is striving to pass IBM and currently has over 25,000 employees working directly in the Indian market. (The Times of India 2011).

Wipro is strategically positioned to take advantage of the projected increase in healthcare IT spending. The company has already established a presence in these markets with remote health monitoring, E-health initiatives, and health information exchanges. As the smartphone market continues to grow due to strong consumer demand, Wipro has a strong hold on the mobile devices services domain. Wipro already offers complete mobile ecosystems and end-to-end services. In the highly competitive IT services industry, the company differentiates itself with a broad range of research and development services for its clients. Wipro can offer a client R&D services that include concept development to product completion. Wipro success and growth are dependent on the hiring and retention of its employees. The company's business model is manpower intensive so the attrition problem – at least 10% - will continue to cause problems as well as the threat of losing its best employees to the competition. (Datamonitor 2011).

The majority of Wipro's revenues come from the US and Europe, with 50% and 20% respectively. In the quarter ending December of 2011, the company's profits were up over 10% from the previous quarter. TK, Kurien, CEO, says the company does well during economic downturn as companies look to cut costs. (CNBC 2012). The dependency on US and European markets is a weakness as unemployment in these geographic areas could mean a reduction in consumer spending with Wipro's clients. (Datamonitor 2011). The IT portion of Wipro provides close to 75% of its total revenue but the company continues to look beyond that sector for new growth. The company is also the world's largest supplier of hydraulic cylinders, an investor in clean energy and water, a manufacturer of modular design furniture and storage, and owns 49% of Wipro-GE healthcare. (Business Today 2009).

Aegis BPO

Rs 19.19 billion; Total employees 39,000; Key Leaders Aparup Sengupta (managing director); Growth 23%: This is a company that focuses on the cutting edge and looks to grow their business through new technologies with focus on a customer centric service model with realistic expectations for both client and employee. Aegis describes its vision as

Operational Risk Management

Consider the effect of weather on theme parks and their customers. Bad weather dramatically reduces the number of visitors, exposing the theme park's owners to considerable weather-related risk. This risk extends to customers as well. A vacation destination with unpredictably unpleasant weather compels potential visitors to bear some weather risk; a vacation destination without these characteristics lessens their weather exposure. An alternative operational model is to have multiple theme parks close enough to major population centers that customers can observe the day's weather forecast and then decide whether to visit the theme park. In this model, inclement weather reduces park visitors (a risk to the firm), but also lessens the customer's weather risk exposure.

Risk Management using Targeted Financial Instruments

The operational adaptations to risks outlined above are changes that managers have actually implemented. Some risks cannot be managed effectively through the operations of the firm, either because no feasible operational approach exists, or because an operational solution is simply too expensive to implement or it is too disruptive of the firm's strategic goals. Targeted financial instruments such as derivatives (futures, swaps, or options) or insurance can be an alternative to using operations directly to reduce risk. Such instruments are available for many commodities, currencies, and stock indices, interest rates, and the menu is continually expanding to reflect a variety of other risks including even the weather.

Risk Adjustment via the Capital Structure

The third tool to manage risk does *not* require managers to precisely forecast the source or magnitude of a specific risk. By decreasing the amount of debt in the capital structure, managers reduce the shareholder's total risk exposure. A reduction of debt does *not* reduce the probability of a risk occurring. Instead, a low level of debt serves to blunt the impact of risks that do occur. More specifically, lower debt means that the firm has fewer fixed expenses, which translates into greater flexibility in responding to any type of volatility that affects firm value. Lower debt also reduces the chance that the firm becomes financially distressed. In contrast, a firm with high leverage is more likely to default on its debt when faced with unexpected variations in demand for its product, or increases in its input costs. The leverage induced by debt magnifies the effect of nearly all types of risk. The primary advantage of managing risk by using a larger proportion of equity in the capital structure is that equity provides an all-purpose risk cushion against loss.

Implementing Integrated Risk Management: Identify, Measure, and Optimize Risk Bearing

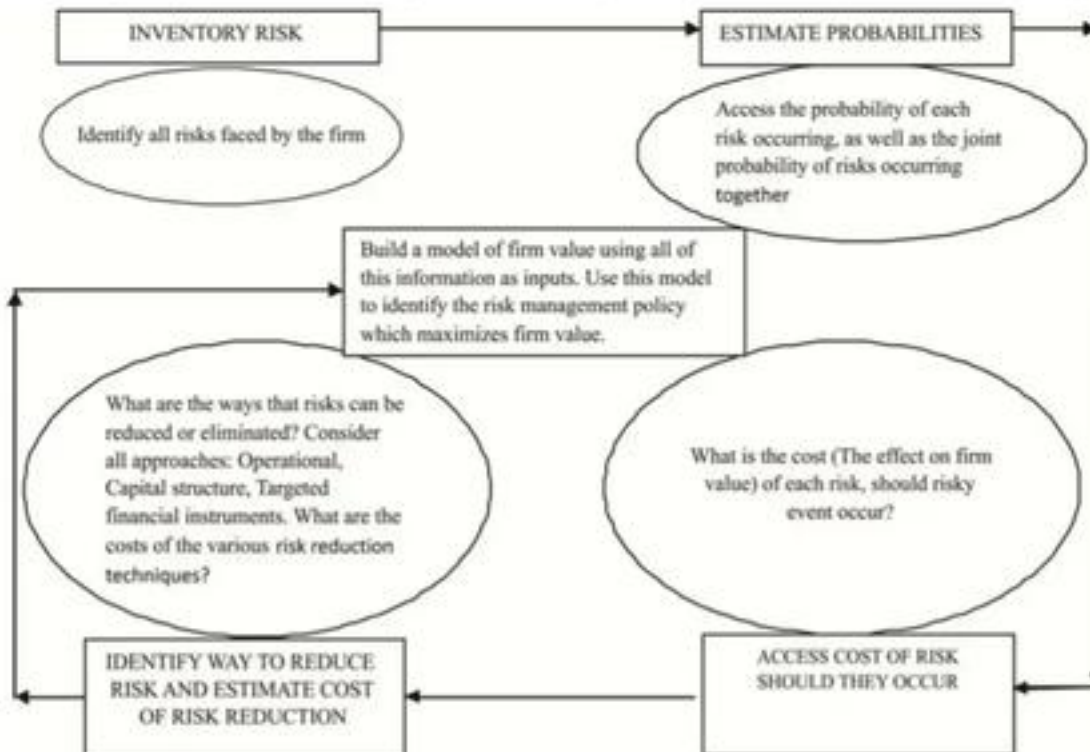


Fig. 1

Having explored the three basic tools for firm-wide risk management, we close with an integration of the preceding sections that frames the broad managerial issues surrounding the development and implementation of a risk management system for the firm. Risk reduction has the potential to increase firm value. Whether risk reduction actually increases firm

value depends upon the cost of that reduction. As a general matter, managers should eliminate all risks that need not be borne by the firm in order to capture the positive net present value of its activities and that are costless to shed. If, however, risk reduction is costly, managers must evaluate whether the benefits of elimination justify the costs. Such an analysis requires that managers estimate the effect of each risk on firm value, understand how each risk contributes to total firm risk, and determine the cost of reducing each risk. To formally calculate the value-maximizing risk management strategy, this information must be incorporated into a model of firm value. By varying the inputs to the model, managers can observe how firm value changes when various risks are hedged or not. In this fashion, managers will be able to determine the optimal level of total risk for the firm, the configuration of risks constituting this level of risk and the best way to achieve the desired risk profile. Of course, creating such a valuation model requires extensive knowledge about consumer demand and the nature of competition in the industry. Other information will need to be amassed over time, as managers become more aware of what information is necessary, and begin to collect the required data.

Building a Risk Management System FIGURE Insert



Fig. 2

The key steps in the development of a risk management strategy appear in Figure 1. One begins by inventorying all the risks faced by the firm. The compendium in Figure 2 organizes risks into seven categories and may be useful in building the firm's lexicon of risk. Operational risk, product market risk, input risk, tax risk, regulatory risk, legal risk, and financial risk comprise the broad classes of risks faced by most firms. The seven spokes radiating towards the vertical underscore that individual risks aggregate to form the overall risk exposure of the firm. After management has both inventoried the various risks, and assessed the probability of the risks occurring (both as separate events and concurrently), the next step is to estimate the effect of a particular risk on firm value.

To illustrate how one might begin mapping a risk management strategy, consider the risks faced by a rapidly growing firm. The managers of this firm know that the firm's rapid growth introduces substantial risk. The goal of the risk inventory is to transform this general observation into a more detailed description of how the risks induced by growth might affect the value of this firm. Suppose the firm is a toy manufacturer, and the firm's rapid growth is a result of the success of one particular toy. The managers expect the demand for this toy to drop as the fad wanes, so volatile consumer demand is one major source of risk for this firm. Suppose further that the firm is a Japanese firm that exports much of its product to the United States. Then the firm's U.S. sales may depend upon relative yen/dollar exchange rates, where the nature of the competition in the United States determines the relation between exchange rates and firm value. For simplicity, assume that the toy manufacturer has no other risks.

CONCLUSION

Corporate risk management is evolving rapidly, but the practice of risk aggregation is not yet widespread. Instead, the institutional organization of the typical firm tends to isolate and manage risks by type. Production and operations management will consider risks associated with the production process. The insurance risk manager focuses on property and casualty risks. Human resources may address employment risks. So, as a practical matter, integrated risk management requires the unification (at least for the function of risk management) of previously separate institutional units. The firm, rather than the type of risk, provides a frame of reference. And, coordination of risk management across separate areas is only the first step. Managers must expand the often times narrow focus of their current risk management practices, moving from a "tactical" to a "strategic" approach. Where tactical risk management has limited objectives, usually the hedging of specific contracts or of other explicit future commitments of the firm, strategic risk management addresses the broader question of how risk affects the value of the *entire* firm. It takes into account how risk affects the firm's competitive environment, including the pricing of its products, the quantity sold, the costs of its inputs, and the response of other firms in the same industry.

Indeed, a firm can be completely hedged tactically, while still having substantial strategic exposure, so integrated risk management demands that managers look beyond the usual definition of "hedging." Because an integrated approach to risk management departs from the rigid compartmentalization of risks, and requires a thorough understanding of the firm's operations, as well as its financial policies, risk management is the clear responsibility of senior managers. It cannot be delegated to derivatives experts, nor can management of each individual risk be delegated to separate business units. Although management will no doubt seek counsel from managers of business units or projects, it must ultimately decide which risks are essential to the profitability of the firm, taking into account cross-risk and cross-business effects, and develop a strategy to manage those risks. The rapidly expanding universe of tools available for risk measurement and management offer manager's significant opportunities for value creation, but this growth also creates new responsibilities. Managers must understand how to use these tools, and actively decide on their selective application.

REFERENCES

- [1] Dolde, W., (1995), "Hedging, Leverage, and Primitive Risk," *Journal of Financial Engineering* 4 (2), pp 187-216.
- [2] Froot, K. A., Scharfstein, D.S. and Stein, J.C. (1994), "A Framework for Risk Management," *Harvard Business Review* 72 (6), pp91-102.
- [3] Haushalter, G. D., 1999, "Financing Policy, Basis Risk, and Corporate Hedging: Evidence from Oil and Gas Producers," *Journal of Finance* 55 (1), pp 107-125.
- [4] Lewent, J. C. and Kearney, A.J. (1990), "Identifying, Measuring, And Hedging Currency Risk At Merck," *Journal of Applied Corporate Finance*, pp19-28.
- [5] Luehrman, T. A., (1990), "Jaguar plc, 1984," *Harvard Business School Case 9-* pp290-005 (May 18, 1990).
- [6] Meulbroek, L., (2001), "The Efficiency of Equity-Linked Compensation: Understanding the Full Cost of Awarding Executive Stock Options," *Financial Management* (Summer 2001), pp5-30.
- [7] Smith, C. W. and Stulz, R.M. (1985), "The Determinants of Firms' Hedging Policies," *Journal of Financial and Quantitative Analysis* 20 (4), pp391-405.
- [8] Stulz, R. M., (1996), "Rethinking Risk Management," *Journal of Applied Corporate Finance* (Fall), pp8-24.
- [9] Tufano, P., (1998), "Agency costs of corporate risk management," *Financial Management* 27 (1), pp 67-77.

Globalization and Corporate Social Responsibility

Parul Jain¹, N.C. Pahariya² and Madhuram Kulshrestha³

¹Research Scholar, University, Jaipur

²(Rtd) Professor, Univ. of Rajasthan, Dean- Faculty of Humanity & S.Sc., NIMS University, Jaipur, Rajasthan

³Assistant Professor, NIMS, NIMS University, Jaipur

Abstract—This paper will investigate the importance of globalisation for Corporate responsibility, its relevance to international development and poverty alleviation. Globalisation is often portrayed as a new era, bringing changes that are as vital as those of the industrial revolution. There is a big relationship between society with business and international players. With the entrance of private sector the importance of corporate responsibility and its impact is increasing day by day. Globalisation is associated, on the one hand, with a limited set of global governance mechanism and weakened national government and on the other hand with unprecedented private sector wealth, power, and impact. Corporate responsibility has thus become an important means for addressing the fundamental problem with contemporary globalisation which means a system of global governance without global government. The purpose of this study is to present the ways in which globalisation influence governance and the implication of this for corporate responsibilities.

Keywords: Corporate social responsibility (CSR), Case studies, Globalisation, its challenges.

INTRODUCTION

Corporate Social Responsibility (CSR) has become a major focus of interest not only for corporate managers but also for development practitioners, both within the NGO community and within the multilateral and bilateral development agencies. Development NGOs have, for the most part, been extremely critical of the intended initiatives undertaken by the corporate sector. In a recent report Christian Aid stated that 'CSR is a completely inadequate response to the sometimes devastating impact that multinational companies while a recent Oxfam study highlights the way in which the supply chain purchasing practices of retailers in the garment and horticulture sectors undermine their professed aspirations to social responsibility as set out in their corporate codes of conduct. Official development agencies take a much more positive view of the development impacts of CSR. The World Bank actively promotes CSR through its Corporate Social Responsibility Practice and its training arm the World Bank Institute.

DEFINITION

A single globally-accepted definition of CSR does not exist, as the concept is still developing. Corporate social responsibility always link with various factors, such as corporate sustainability, corporate social investment, triple bottom line, socially responsible investment and corporate governance. However, various individuals and organisations have developed formal definitions of CSR, including:

'The commitment of business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve their quality of life'

(World Business Council on Sustainable Development).

GLOBALISATION

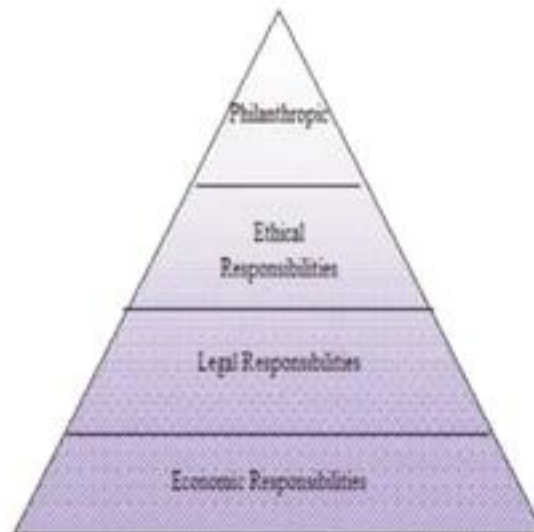


Fig. 1

As a consequence of cross-border trade, multinational enterprises and global supply chains, there is an increased awareness on CSR concerns related to human resource management practices, environmental protection, and health and safety, among other things. Reporting on the CSR activities by corporate is therefore increasingly becoming

'Operating a business in a manner that meets or exceeds the ethical, legal, commercial and public expectations that society has of business' (Business for Social Responsibility).

Archie Carroll in 1991 describes CSR as a multi layered concept that can be differentiated into four interrelated aspects—economic, legal, ethical and philanthropic responsibilities mandatory. In an increasingly fast-paced global economy, CSR initiatives enable corporate to engage in more meaningful and regular stakeholder dialogue and thus be in a better position to anticipate and respond to regulatory, economic, social and environmental changes that may occur.

There is a drive to create a sustainable global economy where markets, labour and communities are able to function well together and companies have better access to capital and new markets.

Financial investors are increasingly incorporating social and environmental criteria when making decisions about where to place their money, and are looking to maximise the social impact of the investment at local or regional levels.

CHANGING PUBLIC EXPECTATIONS OF BUSINESS

Globally companies are expected to do more than merely provide jobs and contribute to the economy through taxes and employment. Consumers and society in general expect more from the companies whose products they buy. This is coherent with believing the idea that whatever profit is generated is because of society, and hence mandates contributing a part of business to the less privileged. Further, separately in the light of recent corporate scandals, which reduced public trust of corporations, and reduced public confidence in the ability of regulatory bodies and organisations to control corporate excess. This has led to an increasing expectation that companies will be more open, more accountable and be prepared to report publicly on their performance in social and environmental arenas.

CORPORATE RESPONSIBILITY AS A RESPONSE TO GLOBALISATION

Globalisation is a necessary part within which contemporary corporate responsibility has emerged. Criticism of big business commented that reaping the benefit of globalisation without taking responsibility for its negative. Specific initiatives like codes of labour practice and participation in environmental agenda are first emerged out which gave variance of regulatory structure and economic structure of increasing global trade. This does not mean that the issues which emphasis by corporate responsibility are important factors of globalisation. Many issues like slavery, deforestation, child labour etc took place before globalisation. Globalisation helps to make things quicker, larger and more visible than before and this help to give force to corporate to work in responsible manner.

Corporate and their responsibility is somehow making benefit of globalisation and making new resources for human and society development. Global responsibility is one of the main component of corporate to create wealth and maintain stability in business. Due to increase in competition and foreign entrance give high pressure to corporate to develop the unique system of development of society and human capital. There are many companies all over the world who take corporate social responsibility initiatives and some criticise this concept. From their point of view CSR is just a concept of gaining attraction among all.

Different international cases which shows how corporate pursuing profit with relevance to corporate responsibility.

- Nike factories in Asia were criticised for extremely poor working conditions and for employing young children.
- Nestle received criticism in relation to its' practices including unethical marketing and utilising a supply chain that uses child bonded labour.

FONEBAK- BUILDING A MULTI MILLION POUND BUSINESS OUT OF RECYCLING

Case Study

There are over 1.28 billion mobile phone users across the world and over 342 million users in Europe alone. UK consumers get rid of their mobile phones on average every 18 month, leaving behind the lithium ion, platinum, gold, silver, copper, and plastics that make up every phone. Established in 2002. Fonebak recycle and reuses mobile phones for phone operators, retailers and corporations. Individual can drop off their phones at major stores or send them directly to the company, which donates apart of their value to nominated charities. The material are removed and recycled from broken and absolute phones, while serviceable phone are refurbished and use i developing countries. It has over a thousand clients representing all network operators in the UK and many major networks, retailers, manufacturers and charities across Europe and had generated £60.4m in revenue as of mid 2006.

MAIN CONSEQUENCES OF GLOBALISATION

There are two crucial elements of society which is affected by globalisation these are:

1. Practice of business
2. Process of Governance

Global Capital, Production and Trade

For business, the most important outcomes of globalisation has been the vast increase in international trade and investment. In the last half of the twentieth century, the value of world trade soared from \$57bn to \$6 trillion. This has gone hand in hand with the liberalisation of financial transaction, technological advancement, deregulate interest rate and privatize banking has created much greater investment opportunities. Today, global business to business opportunities transaction are worth about \$6 trillion.

The Changing Nature of Governance

The basic factor of globalisation is how changes occur in society and how society is governed. For example a national government can legislate on toxic emission, but once those emissions affect the global commons, a multinational solution is required.

Challenges Faced by CSR under the Globalization

Most corporations, especially multinational corporations (MNCs) have already adopted CSR policy despite the fact that there are still some difficulties. Under globalization, states power has weakened where as the power and influence MNCs have significantly strengthened, making them become more state-like. This expansion of role played by MNCs in society has urged the rise of concern groups to pressurize on them to take up more social responsibility.

Limitations of Jurisdictions

Under globalization, many corporations have outsourced their products manufacturing process to other countries, mainly developing countries. In those countries, domestic legislations do not usually provide sufficient protection on labour, such as minimum wage or guidelines on health and safety in the workplace. Even countries like China, which does have a well drafted labour protection legislation, labour exploitation issues still exist because of weak enforcement of the law.

No Direct Responsibility Imposed on the Purchasing Firms

Even if the domestic law is well imposed, the purchasing MNCs are not legally responsible for any of the charges. Ultimately, it is the domestic factory or firm will be held responsible. Since there almost no punitive measures on the MNCs, the law and enforcement system fail to function here. Since it is not an obligatory commitment for the MNCs to provide fair and safe labour treatment, whether a MNC will give equal treatments to factory workers will largely depend on how socially responsible they are. Although acquiring state-like characteristics, businesses are nonetheless still profit-driven actors.

Difficulties in Auditing

In order to comply with higher standard of CSR, some firms have undergone active research and auditing on the firms they hired in their supply chain. Discrepancies between reality and audit results do exist. Taking Foxconn as example, after the several tragic incidents of workers suicide, Apple decided to investigate the work condition of those related factories. Its investigation report shows that there are no issues of overtime work, no child or forced labour, which is in the contrary to what the NGOs claim. Ironically, after the hope of good working conditions in the investigation report, the suicide incidents have not stopped, which just shows that the conditions have not been improved. One very crucial difficulty in auditing is that the factory can always hide the bad things since they know what they look for. Workers could also be under pressure and not tell the truth. Since difficulties exist while carrying out active auditing, its effectiveness and reliability is therefore questionable.

Restricted Factories' Attitude

Very often the list of supplying companies and factories are confidential to the public. Since local factories are not directly link to the public, their only goal is to satisfy demands from the purchasing firms. Hence, 'social responsibility' is an idea which they may not even be bothered to care. Though the purchasing firms may carry out active research on the companies and factories, as addressed above, there are always ways to hide reality away. Moreover, since there are many of this kind of factories over the world, the purchasing companies may not have much choice other than 'choosing one sweatshop over the other'.

THE UNMET CHALLENGES

Corporate responsibility faces three main areas of criticism relating to how it undertakes the challenges and crash of globalisation. The first of these is that business can do more to find new solution to meet the challenges that globalisation present. There is general outcome that government cannot meet the challenge alone. There should be the formation of non state actors, such as private sectors are essential. But private sector involvement needs to be very responsible and value driven.

The second criticism is more challenging. It found that business has tried to address society concerns through certification schemes, adoption of global framework agreement, standard setting and monitoring. But to many companies have not participated, there has been limited participation of corporate responsibility ideas across the corporate structure. Taking initiatives especially in developing countries with response to globalisation has seen very weak.

The final criticism of corporate responsibility as a response to globalisation builds on corporate responsibility's capacity to alter perception of corporate self interest. It has perceived that many globalisation's shortcoming are exacerbated by companies pursuing their narrow self interest. Companies focus on those issues that they feel will affect their reputation or they can serve their self interest in another way e.g. investing in maintaining the healthy and educated workforce, protecting their image and status etc.

CONCLUSION

Globalisation is a specific historical era that is redefining the role of business in the world. The human and environment consequences of globalisation are causing to rethink corporate responsibility. Because of increase in competition globalisation emphasis on economic phenomenon that foster the convergence of the world's economies in the global market. Globalisation is particularly applies in developing countries but poverty and its consequences have become closely related or associated with globalisation. There are many challenges that CSR are facing under globalisation such as Limitations of jurisdictions, No direct responsibility imposed on the purchasing firms, Difficulties in auditing, Local factories' attitude. Various national and multinational firms like Infosys, Coca cola, Dr. Reddy lab., Tata etc takes initiatives in corporate social responsibility. Government alone will not be able to take whole responsibility under globalisation. Many state actors or others have to be participated in these activities. Corporate should not take initiatives just because of earning profit and for their self interest they have to work as a global players and think for contemporary globalisation and make it successful.

Now a days, CSR has become a challenging subject in all over the world. In some countries this become compulsory to contribute in CSR activities not because of their self interest but for the economy development and society welfare. When a country think or act like that it become society or people centric rather than profit centric. Today, important companies and organisation see global poverty and international development as critical mission for corporate responsibility.

REFERENCES

- [1] Agenda. 2001. Promoting a European Framework for Corporate Social Responsibility: Group discussion on the links between social responsibility and sustainable development. Agenda: Social Responsibility in Scotland, www.agenda-scotland.org
- [2] Allentin, S. (2007). "The Role of Governments in Promoting CSR in the Nordic Countries. Danish case." Nordic Centre for Corporate Responsibility meeting, Helsinki, pp20-21.6.
- [3] Bansal, P., R. Roth (2000). "Why Companies Go Green: A model of Ecological Responsiveness". The Academy of Management Journal, Vol.43, No.4, pp. 717-736
- [4] Bulkeley, H. (2001). "Governing Climate Change: The Politics and Risk Society". Transactions of the Institute of British Geographers, New Series, Vol.26, No.4, pp. 430-447.
- [5] Brand Strategy (2007). "10 key things to know about CSR". London. pg.47.
- [6] Bhattacharyya, S.K., & Rahman, Z. (2003). Why large local conglomerates may not work in emerging markets, European Business Review, Vol 15, No 2, pp. 105-115.
- [7] Corporate Social Responsibility in India, Policy and practices of Dutch companies, CREM-report nr. 03.650, Amsterdam, The Netherlands, February 2004, Retrieved on September 2, 2004 from Global Economic Prospects and the Developing Countries, World Bank, 2002.) No. 09-2003 ICCSR Research Paper Series - ISSN 1479-5124
- [8] Chambers, E., Chapple, W., Moon, J. & Sullivan, M. (n.d). CSR in Asia: A seven country study of CSR website reporting, retrieved on August 15, 2004 from www.nottingham.ac.uk/business/ICCSR/09-003.PDF.
- [9] Edenkamp, P (2002). Insights into how consumers are thinking, how they are acting and why, Brandweek, Vol. 43, Issue 36, pp 16-20.
- [10] EU Green Paper (2001). Promoting a European Framework for Corporate Social Responsibility. Brussels, Commission of the European Communities, Retrieved on August 27, 2004 from www.btpic.com/Societyandenvironment/ Reports/GreenpaperonCSR.pdf
- [11] Fry, L. W., G. D. Keim, R. E. Meiners (1982). "Corporate Contributions: Altruistic or for Profit?" The Academy of Management Journal, Vol.25, No.1, pp. 94-106.
- [12] Grace, D., S. Cohen (2005). Business Ethics: Australian Problems and Cases. Oxford University Press. ISBN 0195507940.
- [13] Gray, R. (2001). Social and Environmental Responsibility, Sustainability and Accountability, Can the Corporate Sector Deliver?, Glasgow, Centre for Social and Environmental Accounting Research, University of Glasgow, Retrieved on August 14, 2004 from www.agenda-scotland.org/documents/ Can%20business%20deliver%20Gray.pdf
- [14] Mohan, A. (2001). 'Corporate Citizenship: Perspectives from India', Journal of Corporate Citizenship, Spring, pp 107-117.
- [15] Prahalad, C. K. & Kenneth, L. (1998), "The End of Corporate Imperialism," Harvard Business Review, July-Aug, pp. 68-79.
- [16] Raynard, P., & Forstater, M. (2002). Corporate Social Responsibility: Implications for Small and Medium Enterprises in Developing Countries, United Nations Industrial Development Organization, Retrieved on August 11, 2004 from www.unido.org/userfiles/BethkeK/csr.pdf
- [17] Robbins, N. (2000). Position Paper on Emerging Markets and Human Rights, Henderson Global Investors, Retrieved on September 12, 2004 from www.ampcapital.com.au/_PDF/adviser/sri/papers/Emerging_Markets.pdf.
- [18] Vedung, Evert (1998): "Policy Instruments: Typologies and Theories." In Marie-Louise Bemelmans-Videc, Ray C. Rist & Evert Vedung (eds.): Carrots, Sticks & Sermons. Policy Instruments & their Evaluation. London: Transaction Publishers.
- [19] Vilsted, Petter Jørn (2003): "Room for governments within CSR? - Public roles and considerations." The 17th Nordic Conference on Business Studies, Reykjavik, 14-16.B. Conference paper.
- [20] Visser, W., D. Mamen, M. Pohl, N. Tolhurst (eds.) (2008). The A to Z of Corporate Social Responsibility. Wiley, ISBN 978-0-470-72395-1
- [21] Windsor, D. (2001), "The Future of Corporate Social Responsibility", in The International Journal of Organisation Studies, 9 (3), pp. 225-256.

Trends in Regulations on Employment Termination Issues: A Study on Contemporary Practices

Indranil Bose¹ and R.K. Mudgal²

¹Assistant Professor, Lal Bahadur Shastri Institute of Management & Technology, Bareilly

²Registrar & Professor, Teerthankar Mahaveer University, Moradabad

Abstract—Since globalization and liberalization started in early 1990s, structural adjustment in the socio-economic fabric of the participating countries in the process has got real momentum. One of the major intervention area has been the issue of job-security and employment termination. However, in most of the countries across the globe, dismissal from service remains a major sensitization issue, where the regulations are still interpreted differently by different segments of society. International Labour organization (ILO) is facing the greatest ever challenge since its inception to maintain the balance between the conflicting forces locally and globally to reshape the employment regulations to ensure a proper trade-off between job security and commercial interests. The paper attempts to explore the different aspects of employment related legal provisions and practices on the basis of relevant issues like sources and scopes of employment regulations, contract of employment, termination of employment, notice and prior procedural safeguards, severance pay, avenues for redressal and reinstatement of terminated employees.

Keywords: Globalization, employment termination, employment related legal provisions, relevant issues etc.

INTRODUCTION

An employee's right of not to be unfairly or unjustifiably terminated from service is a modern cornerstone of the law relating to the employment. Though, this is not accepted as a general right in many developed countries like Austria, Belgium, Denmark and United States, yet in most of the emerging economies, including the BRIC countries, the issue has remained the part of many recent regulatory debates and deliberations. Moreover, in these countries, where such rights are recognized, a wide variation of its legal and constitutional status remain as the basic underlying conceptions of such conceptions and justifications. It has been observed in these countries that such right of not to be unfairly or unjustifiably termination from employment is either variously reflected in the legal systems of respective countries or as a right created by statute or a right developed by the courts or a policy secured by collective bargaining only.

In most of the developing countries, some common legal traditions are widely visible based on local influences and various justifications. Following are the concepts and factorial influences observed. *Firstly*, the growing demand and awareness of individual justice, whereby the employers are prohibited from making arbitrary dismissals; *secondly*, the demand for legal intervention for justified compensation practice in case of collective dismissals for economic reasons; *thirdly*, the cover of legal protection against any discrimination by the employer either for forming or joining any trade union or for being from a particular race, religion etc.; *fourthly*, presence of some regulatory framework to protect the employers from excessive litigation costs those can arise from employment termination; *fifthly*, role of anti dismissal regulations in promoting the training and development practices at the workplace and thus ensuring employment security to a greater extent in many sectors and *finally*, a growing attempt to link the issue of employment protection with the human rights issues and reflection of such trend in many human rights regulations in some of these countries.

EVOLUTION OF THE INTERNATIONAL DEBATE ON DISMISSAL OF WORKFORCE

The regulation of employment termination has been under scrutiny since the advent of labour law as a separate discipline. These regulations have simply been modified across the world to accommodate and adjust changes over the years. It is not surprising at all that in the recent times of globalization and liberalization, marked by high growth of structured unemployment, a new round of thinking on the content and scope of employment regulations has emerged. In contrast to many civil law systems, the right to employment security has been growingly accepted as the element of human rights promotion. Within this legal tradition, the right of not to be unfairly dismissed is seen as part of a broader human right to employment and job-security. Universal declaration of Human Rights has not only recognized the right of all persons at work the free choice of employment, just and favourable conditions of work and protection against unemployment (article 23) and similarly the International Convention on Economic, Social and Cultural Rights recognizes the right of all persons to have the gainful opportunity to earn their living by freely chosen work and obliges the states to take steps to achieve steady economic, social and cultural development and full and productive employment (article 6). The constitution of International Labour Organization (ILO) proclaims that all human beings have the right to pursue their material well being and sustainable living in conditions of economic security. In tandem of these declarations, different regional and global institutions have incorporated the agenda of employment protection as one of the major instrument of protection of human rights across the world. ILO instruments promote formulation and development of government policies promoting full, protective and freely chosen employment. In the 19th century, throughout continental Europe, the first standards of termination of employment were to be found in civil code provisions concerning the hiring of manpower. Those laws provided for absolute freedom in hiring and dismissal in response to the prevailing theories of economic liberalism.

This last rule is the foundation has been referred later as employment at will (as still exists, for example, in most of the developed economies). This concept, combined with the doctrine of managerial prerogative, confers on employers' discretionary power over the continuation of the employment relationship. The subsequent growth of labour movement across the globe has highlighted the need for legislative recognition of the workers' rights of higher employment protection, which started to be realized by the beginning of 20th century by the sparked change in the thinking of the legislators.

The restriction of dismissal without cause was gradually broadened in countries whose legal systems were based on the Napoleonic Code and, by the 1940s, most States within this legal tradition had enacted legislation on the justification of dismissal, notice (generally extending existing notice periods) and the payment of severance allowances.

During the economic expansion of 1960s and 1970s, protective standards on employment security were regularly incorporated in the national labour regulations. However, during the economic crisis of 1980s in many parts of the globe has drawn criticism about the protective employment regulations. The resulting notion of deregulating dismissal as a panacea for unemployment remains a burning issue till today.

In parallel with national developments, the ILO International Labour Conference in 1950 has also adopted a resolution noting the absence of supranational standards, thereby paving the way for a series of actions which led to the adoption of the Termination of Employment Recommendation, 1963 (No. 119). This Recommendation was the first international standard aimed specifically at employment termination. Later, in 1974, recognizing the importance of the instrument which had been adopted, the Committee of Experts on the Application of Conventions and Recommendations concluded that the Conference should again discuss the matter in order to draw up another instrument taking into consideration new developments since the adoption of Recommendation No. 119. This led to the adoption in 1982 of the Termination of Employment Convention (No. 158) and Recommendation (No. 166). National and international standards simultaneously continued to change and adapt, although the principle of protecting employment security was generally maintained. While opposition to this principle is increasing in some countries, most jurisdictions now have statutes or regulations on termination of employment, often supplemented by collective agreements, codes of practice on equal opportunity, work rules and, especially in common-law countries, case law.

However, the mere existence of regulation does not ensure its application in practice in many growing economies like India, China etc. In some cases issues have arisen regarding enforcement, and, in many countries sharp criticism is increasingly getting voice as irrelevant to the contemporary economic requirements of employers and of the constraints, such regulation imposes on dismissal. Indeed, the debate on the regulation of employment termination is very much alive in today's globalised world.

REGULATORY TRENDS ON THE ISSUES OF DISMISSAL

Since 1980s, international communities and national regulatory reforms initiatives are growingly addressing the following issues on employment termination. These are:

- Unjustified dismissals
- Notice
- Severance pay
- Compensation
- Avenues for redresses
- Reinstatement

The scope of labour regulations regarding termination of employment may include, according to the approach taken in the national system, all workers in the private sector. Most standards in force in the area of termination of employment arose out of the need for protecting the worker from any sudden decision of employment termination by the employer. For this purpose, a series of conditions to guarantee the fairness of dismissal were established through regulatory provisions with the objective of putting an end to the discretionary power of the employer to terminate employment without stating a reason. Most current regulations dealing with employment termination require the fulfillment of not only prior procedural requirements before dismissal, but also impose an obligation on the employer to substantiate the reasons justifying dismissal. In fact, legislation in most countries regulates these aspects in great detail. From the legal perspective, the employment contract has been seen as a bilateral legal transaction, the fulfillment and execution of which, according to the general theory of contract law, cannot be left to unilateral declarations and expressions of will by either of the contracting parties. In other words, there must be a reason which prevents the continuation of the contract and which provides a legal foundation for the employers' unilateral wish to terminate the employment contract. However, it is common to have public servants regulated by a different statute (often justified by their special nature and relatively protected status). The employment status of members of the armed forces and the police is likewise often regulated by other statutes. Moreover, in some countries like India legislation on dismissal expressly excludes family workers, persons in senior management positions and positions of trust (where dismissals without any statement of reason are allowed), apprentices, and workers covered by special contracts such as seafarers, fishermen, agricultural workers, home and domestic servants.

In different countries different systems have been gradually evolved in protecting employment from unjustified termination. For example, in the countries like Germany, Austria etc., some bodies of legislation on employment relationship are applied solely on the basis of minimum number of workers employed in the undertaking. Whereas in several other countries like France, Senegal etc. prohibition against unjustified or unfair dismissal is formulated as a general expression to be interpreted by the courts. Several other countries like Belgium, Benin, Netherlands etc. have established a series of procedural requirements, with varying degrees of details, for carrying out individual dismissals and for ensuring the protection of the persons who might be dismissed. In the countries like Portugal, Spain, Luxemburg etc. an obligation to consult with staff representatives (a usual practice in the case of collective dismissals) supplements the general dismissal requirements, including in instances where dismissal is for misconduct or poor performance. Other countries require prior authorization of dismissals. In Ecuador and Haiti, if the employer has not given notice and wishes to dismiss a worker, prior permission from the administrative authority is needed. In Venezuela, legislation provides for the communication of dismissal to a magistrate with jurisdiction over employment security, but in practice the justification for dismissal is determined *a posteriori*. In France and Greece a simple declaration to the administrative authority is considered sufficient.

Notice is a moral as well as legal obligation imposed on the employer during the process of termination of employment to minimize the element of surprise of an act which should not be sudden. It also enables the worker to adjust to his or her new situation and to facilitate his or her search for new employment. This concept existed in earlier contract law before the advent of labour legislation. The concept continues to persist in civil and commercial law. It aims to prevent rash decisions to cancel contracts. Though, notice *per se* does not constitute justification for termination and does not release the employer from any applicable obligation to base a dismissal on a justifiable cause. Moreover, in many countries like Belgium, Brazil, Cyprus, Poland, Portugal etc., every instance of dismissal does not require notice to be placed, and in some countries where justification is mandatory, notice is of secondary importance. Although many countries require notice, the degree of obligation imposed, the duration of the notice period and the forms it takes vary according to legal tradition and national practice. In general, it has been observed that notice is only required for contracts of indeterminate duration because contracts for a specified task, service or period are deemed to expire as soon as the term has passed or the service or task has been performed.

Effective protection of employment and protection against dismissal from service also depend on the **redressal mechanism** implied in the regulatory systems in different countries. However, the capacity to review dismissals is usually conferred on impartial bodies which may vary in their nature and jurisdiction from one country to another. In some countries like Cameroon, Denmark, Belgium etc., the right of a worker to approach a particular body may depend on factors such as whether he or she works in the private or public sector, whether termination was carried out with notice or prior authorization, and the nature of the instrument under which the worker is seeking relief under labour laws, civil laws, contractual clauses on discrimination, a collective agreement etc. The impartial bodies addressing labour related issues may have different status under regulations in different countries. Labour courts or tribunals are in the system in the countries like India, Germany, Gabon, Pakistan, Mali, New Zealand etc. Labour inspectors play the role of quasi-judicial tri-partite bodies in the countries like Philippines, Lebanon, Mexico etc., where disputes on termination of service are raised before referring to the arbitration. Arbitration is a popular practice across the world, but its effectiveness and structural mechanism is different from one country to another. In many countries like Ethiopia, Spain, Hungary etc. arbitration is preceded by conciliation and therefore process is complicated and time consuming. Several countries including USA has the liberal and informal practice of arbitration and therefore is viewed as having the benefits of quicker, less formal procedures and rules of evidence than these governing judicial authorities.

Severance pay is an allowance paid by the employer for terminating an employment relationship, regardless of the reason for termination. The rules governing such allowances are varied and often complex. They are intended to ensure income protection in countries where the social security system does not provide it, or where such protection is inadequate, even though such payments may appear, to those outside the country, to be gratuities for services rendered by workers. Many countries have enacted legislation on severance pay and on the possibility of regulating severance payments through collective agreements. Moreover, some collective agreements and conventions have actually increased allowances prescribed by law, as in Greece where, under a two-year framework agreement signed on 4 March 1996, severance pay granted to workers with more than 15 years of service in an enterprise has been increased. Similarly, in many African countries with a French legal and labour, relations background, inter-occupational agreements set the minimum level of compensation. In general, it can be said that severance payments is a regulatory compulsion of the employer or by a fund set up for that purpose through the employer's contributions. Some countries like Bangladesh, Bolivia, Malaysia, Senegal etc. regard severance allowances as a right acquired by the workers and non-payment of severance pay even in the situations of voluntary resignation etc. is considered as serious offence on the part of the employer. However, across the world the calculation of severance allowance is mostly done on the basis of tenure of employment of the worker with a specific employer. For example, countries like Benin, Mali, Peru and Venezuela have restricted the minimum period of service of one year; Gabon, Chile have made it two years; Hungary and Poland have fixed it three years etc.

Compensation is another area of debate and discussion on the issue of employment termination. The legal basis of compensation is the harm suffered by the worker from loss of employment, but there are very few laws which impose the obligation of proving the extent of damages suffered by the employee, since damages are often assessed on a set scale

happy employees, happy customers and happy shareholders. To achieve this vision, the company works hard to provide opportunities for employees through engagement and nurturing participation, exceeds their customer's expectations by co-creating with them, and provides a business that creates sustainable value by managing all assets. (Aegis 2012).

Over the last 30 years, Aegis has evolved from a contact center service business to a solution-centered, global company that manages the client's experiences from engineering design solutions to shared services to analytics. Aegis now serves over 150 clients in 13 countries with an employee base of 50,000 in 50 locations around the world. (Aegis 2012). Aegis prides itself on being unique in recognizing its success is directly related to its employees. The company's Global Command Centre in Mumbai can recognize a post lunch slowdown in a call center in Gurgaon. The call center's head is notified that he should cut down on breaks in the afternoon to even out the service lost earlier. (Business Today 2011).

Aparup Sengupta, Managing Director and Global CEO, says this is the next generation of outsourcing and will improve the experiences of consumers while helping companies perform better. Aegis is focused on getting as much growth as it can through consolidation and in 7 years (2004 – 2011) made 18 acquisitions. In 2011, the company reported over \$700 million of revenue. With \$17 billion in the BPO sector in 2011, Aegis is poised to earn a larger portion of the pie through a focus on consultancy, investing in employee training, and the use of systems like the Global Command Center. (Business Today 2011).

WNS Global Services

Rs 18.58 billion; Total Employees 21,958; Key Leaders—Keshav Murugesh (CEO); Growth 4%: This organization focuses on top tier brand and leverages its history as being one of the most veteran operators in the BPO space. Service is substantive and includes both standard voice support and automated support as well. WNS has over 200 global clients and delivers a broad spectrum of business processes such as front office processes, finance and accounting, and research and analytics. The company has over 21,000 employees in 23 worldwide delivery centers. (WNS 2012).

WNS Global Services is India's third largest business process outsourcing firm. Keshav Murugesh, CEO, says his company has made large investments in vertical and business lines to grow their technological capability. Interviewed in September of 2011, Murugesh shrugged off the economic uncertainty in the world stating that those BPO's who focused on non-linear growth models will be well suited to ride out any recession. He also said that his clients realize that the off shore model protected them in the previous recession. The company has recently expanded to include shipping, logistics, and healthcare. They are also looking into centers in the North American region and work from a blended profit approach where high profits in some locations offset low profits elsewhere (Business Standard 2011).

Murugesh was recently named to be among the 50 most influential people in the Nearshore Americas region of the outsourcing industry. WNS entered the Latin American region in 2009 when they opened a center in Costa Rica. Under Murugesh's control, WNS has recently collaborated with coAction.com, one of the leading providers of collaboration software in order to reinforce its capabilities in Order-to-Cash (O2C) solutions. This alliance will give WNS further strength in providing one stop shopping to its clients. WNS has also joined with Knowledge Relay LLC to offer Data-to-Decision (D2D) services to its customers in the Energy and Utilities sector. The collaboration will connect the Operational Business Intelligence expertise from Knowledge with the business process services from WNS. Clients will be able to access data from multiple sources and receive unique analytics and forecasting capabilities (WNS 2012).

WNS is also working on growing the domestic BPO market and plans to open a center in south India with 500 employees. The new center will focus on travel, banking, and telecom and although the deals are smaller, WNS plans to focus on private Indian clients versus large government contracts. (The Financial Express 2011).

FUTURE CAPACITY AND TRENDS

Over the last decade measurement of countries that do the most offshore business support have been measured in order to assist IT and BPO management in making decisions on where to move their outsourcing activity. Currently India is ranked number one in the world and has been able to grow the BPO and IT export sector to more than 47 billion dollars and capture half of the entire world's offshore service business.

Clients of India's outsourcing span many nations but it is clear that the Americas and Europe are the largest customers and account for over 90% of the volume. The largest sectors comprising this industry that employ 2.2 million are;

- Financial Services-41%
- High Tech/Telecom-20%
- Manufacturing-17%
- Retail-8%

CONCLUDING REMARKS

India has one the larger emerging economies in the world and is usually grouped together with Brazil, Russia, and China. Forming what many economic analysts refer to as the BRIC countries which have recently had significant influence over the world's economy. They appear to be a substantial opportunity for growth for any of the companies referred to in this

calculated under terms established by law. In some countries like French speaking African countries and some of the European nations like Denmark and Luxemburg monetary compensation is the only remedy for unjustified dismissal. In Latin American countries compensation is calculated on the basis of length of service, whereas countries like France it depends on the nature of the employment and the factors like the age of the worker, and any acquired rights such as bonus and pension also remain the factor of calculation of compensation in the countries like Italy, Morocco etc. Even the size of the enterprise in terms of manpower employed also remain an important factor in calculating the compensation to the retrenched worker in many countries like India, Bangladesh, France and many other nations across the globe. Countries like Gabon and Mali calculates the compensation on the basis of supplements to unemployed benefits.

Reinstatement aims at ensuring employment security and is accepted as a statutory right in many countries, particularly with regard to workers enjoying special protection from dismissal, such as trade union representatives, pregnant women or workers found to have been subject to discriminatory dismissals. In some Latin American countries like Mexico, Peru etc. reinstatement will only be awarded in specific situations, often depending on the size of the enterprise, the length of service of the worker, the nature of the workers' employment, relationship between the worker and the employer etc. In Italy, reinstatement is always allowed in the event of discriminatory dismissal, but in the case of ordinary unjustified dismissals, reinstatement is required only in work centres employing more than 15 workers, or five in the case of agricultural establishments. Likewise, the numbers of the employees remain a major issue in reinstating the employees in the countries like Venezuela, Panama, Mexico. However, the required number may be varied in different countries based on different industry categories or employment categories.

CONCLUSION

Since the inception of labour law discipline prevention of termination of employment in any form has remained one of the major debatable issue. Contemporary attempts to adjust the socio-economic fabric in the context of emerging economic developments have made this debate more intensive. Labour or employment regulations across the globe are speaking in more or less common languages, but their methodologies remain different. The study shows that the intensity of commercial penetration in socio-political system in respective countries have not only changed the political or regulators' perception, but also moulded the social perceptions accordingly. The process is in the continuous stage and the new developments are happening on different aspects of termination of employment contracts across the globe. The most widespread or dramatic developments are supposed to happen in those theatres of global economy, where maximum structural adjustments are imminent as the consequence of adoption of market economy at a broader scale. Research is therefore possible on the situations at the BRIC countries (Brazil, Russia, India and China) as these nations are not only witnessing most dramatic transformation in socio-economic life, but also the most intensive growth contradictions. According to the latest report published by International Institute of Labour Economics, London (Oct, 2011) during the last five years about 94.6 million people have lost their jobs in the traditional as well as modern economy sectors in the BRIC countries alone and about 87.5 million jobs have been created in these countries due to the rapid expansion of private sectors as well. India and China have witnessed maximum relocation of job prospects as per the report. The multi-union situation under fast changing political scenario in India and growing transformation in government controlled trade union – private management relationship at the industry level have made the situation more challenging to the regulators striving hard for a best trade-off. Therefore, economic meltdown and corporate compulsions along with social implications of employment contract scenario has been evolving at a very fast pace across the globe, which may be redefined in coming future with much more intensity and spectrum.

REFERENCES

- [1] Bartolomei De La Cruz, H.; Von Potobsky, G. & Swepston, L (1996), International Labour Organization: The international standards system and basic human rights.
- [2] Gladstone, A., (1986). "The manager's guide to international labour standards", in management Development Series, No. 23, ILO, Geneva.
- [3] Handbook of procedures relating to international labour Conventions and Recommendations(1998), 2nd revised edition (Geneva, International Labour Standards Department.
- [4] Global report on employment relocation (2011), International Institute of Labour Economics, London.
- [5] ILO (1969). "Comparative analysis of the International Covenants on Human Rights and International Labour Conventions and Recommendations", Official Bulletin, Vol. LII, No. 2, pp. 181-216.
- [6] International labour standards: A worker's education manual (1998), 4th revised edition (Geneva)
- [7] Labour rights, international labour standards and international trade (1996), International Training centre, Turin
- [8] Lee, E., (1997) "Globalization and labour standards: A review of issues", International Labour Review, Vol. 136, No. 2 pp. 173-189.
- [9] OECD (2000), International trade and core labour standards, Paris
- [10] Plant, R. (1994), Labour standards and structural adjustment ILO, Geneva.

Fulfilling Product and Brand Promises through Innovation

Brajesh Kumar¹ and Sandeep Kumar Mishra²

¹MBA Student, Bisra Institute of Technology Trust (Punjab Technical University), Ranchi, Jharkhand

²Faculty MBA, Institute of Management Studies, Ranchi University, Ranchi, (Jharkhand)

Abstract—The concepts of branding and product innovation have been converging. This development is beneficial both for the brand and the product. On the one hand, the brand can benefit from the product because the product has a more direct impact on the consumer than the brand. In its turn, the product can benefit from the brand because it offers a way to differentiate it emotionally. It is well known that branding and product innovation play a vital role in durable product manufacturing. Their respective roles in creating sustainable differentiation advantages for the company have been studied extensively. Recently, the two fields have been converging: the discipline of branding can no longer ignore the product as a major contributor to brand equity, while the discipline of product innovation needs the brand to reach the heart of the consumer. This research finds the methods for Brand Driven Innovation in literature and in the field and to distil a coherent and practical model from the findings.

Keywords: Product, Brand, Promise, Innovation, Brand equity.

INTRODUCTION

When businesses think of brands, they don't usually consider brands as being part of the innovation process, right there at the cutting edge of value creation. Well, it's time to change that perception of brands. Truth is, brands themselves can be powerful engines of innovation. They can reprogram a product that does A, B and C into one that does A through M, plus X, Y and Z. They can redefine the context of a business, unlocking new value. They can spring customers to higher levels that competitors can't reach. Through their own platforms and programs, they can reshape markets, and create new market opportunities.

Traditionally, brands have been focusing on external communication to position themselves in the minds of the consumer (Aaker, 1996; Kapferer, 1992). Since a few years, a paradigm shift can be discerned: internal branding has become a significant part of the brand's domain (Ind, 2001, Funcke, 2005). In this view, the brand is more than a means of external communication. It becomes an internal source for strategic direction. This implies that also the product innovation process will increasingly look at the brand for guidance. Product innovation is mainly driven by external forces. Most New Product Development projects are initiated by the Marketing department (Borja de Morzota, 2003a), which could be seen as an internal source. If product innovation wants to play a role in fulfilling the brand's promise, it will have to be prepared to look inside, at the brand, for guidance. This new focus will also enable new products to profit from the differentiating power of the brand, in a market where leadership in functionality and/or technology alone can be temporary and fragile (Hamel, 2000, Grant, 1991). Figure 1 shows a number of examples where the product is closely related to the brand it originates from.



Fig. 1

Michael Porter already knew in 1985 that integration of disciplines creates competitive advantage (Porter 1985, cited by Borja de Morzota, 2003a). Other sources (Montague, 1999; Kapferer, 1992, 2004; Karjalainen, 2004) also suggest that integrating the efforts of branding and product innovation can be most beneficial for the corporation.

Brand innovation is product potential times customer potential.

Brand Innovation

Product Potential X Customer Potential

The brand builder is the X-factor in the middle? It grasps the potential on both sides, then adds the strategic and creative powers to bring them to life, and to make them grow. It all adds up to what we call “the brand exponential.”

RESEARCH METHODOLOGY

The research sets out to look for methods for Brand Driven Innovation in literature and in the field and to distil a coherent and practical method model from the findings. This research looks for answers to the following questions:

1. What are brand identity and promise and how do they relate to the consumer?
2. What is the role of product innovation in branding and vice versa?
3. What methodology for Brand Driven Innovation is available?

The preliminary answers found in literature are then tested through primary research. They are held against the opinions of branding and product innovation specialists in the field, through 160 interviews. These interviews, combined with the findings in literature, lead to a BDI (Brand Driven Innovation) model. This model describes a working method to derive product innovations from brand identity. The model is meant for use by brand managers, brand designers, design managers, product managers, innovation managers, and product designers dealing with branded durable products.

PRIMARY RESEARCH GOAL

The literature review has provided valuable insights in what branding and innovation is, and how they are connected. Looking at the goals for this project what is clearly missing in the literature is a clear step by step method to help the target group develop product innovations that fulfill the brand's promise. The goal of the primary research phase can thus be described as follows:

1. To disclose whether a method for Brand Driven Innovation exists in business practice, and if not,
2. To gather sufficient relevant information to develop such a method.

PRIMARY RESEARCH METHOD

The author chose a dual method for his primary research:

1. 160 interviews. These interviews took place in the period from June 15th 2011 to January 16th 2012, at various locations in the India. 130 persons were interviewed in a one on one personal setting, 30 were consulted over a longer period of time, during close cooperation on a project or course.
2. A practical assignment by 70 Industrial Designer.

Sample of Companies and People

The interviewees are from different parts of the corporate world, with different demographic backgrounds and different functions. The statistics are as shown in table 1.

Table 1: Interviewee Statistics

Professional Environment	Academic 29%	Business 71%
Nature of business	Consulting 33%	OEM's 67%
Size of business (employees)	<100 50%, 100-1000 33%, >1000 17%	
Gender	Male 75%	Female 25%
Nationality	Indian 94%	Other: 6%
Average age	38	
Original area of expertise	Product development 56%	Branding 44%
Function: professor	13%	
Function: assistant professor	13%	
Function: design manager	31%	
Function: marketing manager	19%	
Function: Design manager/partner	19%	
Function: General manager	6%	

The statistics show a well balanced palette in the most important areas: professional environment, nature of business, original area of expertise and function. More large businesses will have to be involved in further research. The Industrial product designers that have done the assignment are less varied in their demographics, although they are from all over the world: nationalities are Indian, Dutch, German, Turkish, Brazilian, Colombian, Swedish, Danish, Australian, Chinese, and Indonesian. The statistics are shown in table 2

Table 2: Industrial Product Designers' Statistics

Bachelor Background	Industrial Design 70%	Other 30%
Average age	21	
Gender	Male 45%	Female 55%
Nationality	Indian 65%	other: 35%

RESULTS AND DISCUSSION

The product can be effective communicator of the brand's aesthetical identity in retail environments. But, more interestingly, in its interaction with the consumer during use, the product has the potential to actually fulfill the brand's promise and thus to establish a durable relationship between the brand and the consumer. A conceptual model has been drawn, to clarify the forces that occur within the problem area. The model consists of two situations, each describing a company (on the left) and a consumer, on the right. Situation one (figure 2) represents the undesirable situation where the disciplines of branding and new product development are separated, both in- and externally.

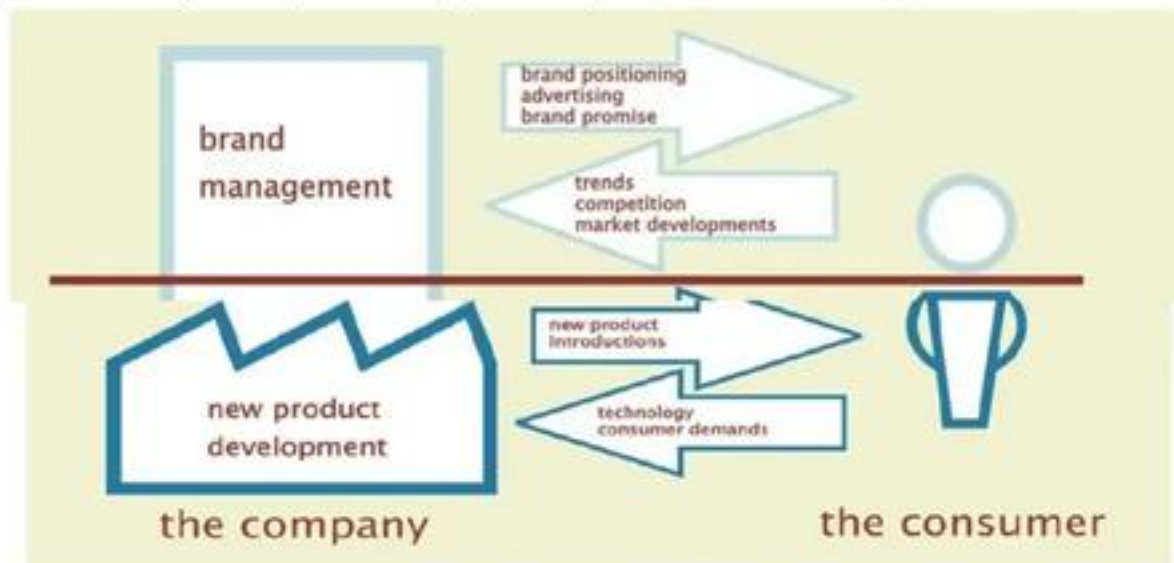


Fig. 2: The Conceptual Model, Situation 1

The separated brand management and new product development departments indicate this situation. They are represented in the model by the separate office and factory, with the red line running between them. All input for both branding and product innovation comes from outside of the corporation. All output from both branding and product innovation goes to the outside of the corporation. The consumer is likely to experience inconsistency between product and brand. The red line indicates this inconsistency, separating the emotional experience (the head experiencing the brand) from the physical experience (the body, experiencing the product).

Situation two (figure 3) represents the desirable situation: the brand and the product work synergistically, both in- and externally. The walls between factory and office have disappeared; the branding and product development departments can mingle freely. Input for branding comes from outside of the company, from product innovation and from the vision, mission and strategy of the company. In turn, input for new product development comes from outside of the company, from branding and from the vision, mission and strategy of the company. Output from branding goes to the outside of the company, but also to product development. Output from product development goes to the outside of the company, but also to branding. The consumer experiences consistency between the product and the brand.

The product and brand benefit from each other mutually. Within this model, the focus of the research is indicated by the two red arrows: the red arrow on the left represents the brand as input for generating new product concepts; the red arrow on the right represents the product fulfilling the brand's promise. The blue arrows indicate the 'other side of the coin': the products developed by the company directly influence its brand. This influence should be managed and used to the brand's advantage. The blue arrow on the left represents this involvement of product design in brand strategy. The blue arrow on the right represents how the brand differentiates the product from the competition and helps it find its way to the consumer.

BDI is only half of the process, IDB being the other half. Both processes play a vital role in product companies. It would be very interesting to see whether a process model for Brand Driven Innovation would also work (the other way around) for Innovation Driven Branding. This process model working in two directions is especially important when the brand and NPD are both seen as tools for strategy implementation, and occupy a similar position in the organisation. Brand builders are innovators, pure and simple. As we see it, the value that brands can deliver is far too important for

brands to be limited to “communications,” symbols, sunny promises and surface sheen. Brands represent a core value connection between companies and their customers. That means brand builders must be able to innovate new forms of brand value that can advance a company and its customers. Brands that don’t innovate are soon overcome by inertia. They stagnate. And then they die.

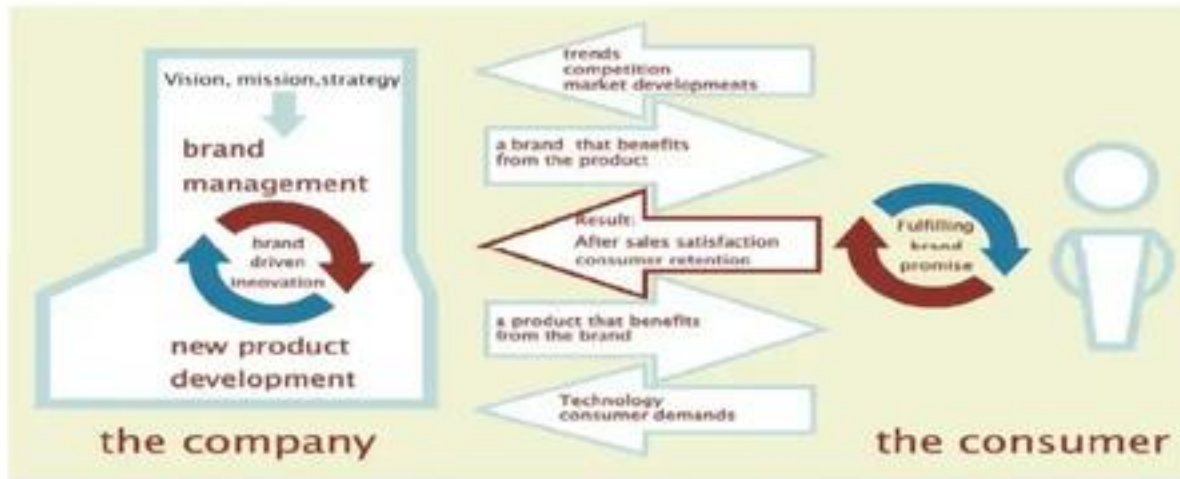


Fig. 3: The Conceptual Model, Situation 2

Our master definition of brand reflects this innovation focus:

“Brands are avenues of value innovation in a creative engagement between companies and their customers.”

In this formulation, “avenues,” “value,” “creative,” and “engagement” are all critical areas where the brand builder can introduce innovative approaches, processes and deliverables. In traditional brands, the brand team is closely tied to marketing and/or corporate communications, outsourcing much of the “creative” work to ad agencies and design firms. While this fits well with the traditional communication model of brands, it does not go far enough for value-based brands.

In value-based brands, the brand team is responsible for innovating brand value. They are, first and foremost, *innovators*. They’re key members of a company’s innovation team. They still maintain their media and communication roles, and contacts with media and design experts, but their focus is on brand innovation as part of new product development. They work hand-in-glove with engineers, programmers, product managers and customers to create new forms of brand value, and the platforms and programs to deliver them. Their mission is to grow the customer, the product, the brand and the business through new streams of brand value. The brand team is both “in the trenches” and “over the horizon.”

Here is a sampling of brands that illustrate aspects of brand innovation:

- *Linux*: A user-driven brand.
- *Harley Davidson*: Customers innovated by customizing the bikes as bad boy machines. Eventually, Harley followed, albeit in tepid, corporate fashion. (The “chopper” zeitgeist is a customer phenomenon of liberating the brand.)
- *iPod*: With iTunes, forms a new brand of music that includes many of the points above. It relieves customers to enjoy more music and to express themselves through their music by having more personal control over it.

Arm & Hammer

Customers found new uses for baking soda, making their lives easier and making new markets for the maker. In essence, the customers led the brand.

Costco

Increases customer access to quality goods at discount prices, while minimizing customer risk with liberal return policies. It leverages startups and enable small businesses.

Patagonia

Advances context of product and customer to a unified brand of ecology, where product, customer and environment cooperate as one.

Innovation is a much used word, but when it comes to the giant corporations who manage power brands, it's become ingrained into their work practices and drives much of what they do. Unilever is a great example of a company who pays a lot of attention to innovation and not just lip service. Highlighted above are small selections of slides from a recent company presentation to investors that indicate the types of things Unilever is doing to innovate.

The actions and the rule sets can be grouped into the following themes:

1. Growing brand by line extension and expansion
2. Doing things faster- rolling out products at a faster pace
3. Finding new ways for extending brands into higher value areas
4. Looking for technical synergies across categories- mayonnaise can help shampoo
5. Find markets where you can repeat success and gain efficiencies
6. Understand consumer needs
7. Get into emerging markets early because they are growing at a rapid pace

Unilever has the power of economies of scale to put these things into practice, but it's worth taking a second to think about your brands and your brand portfolio and what you can learn from Unilever's examples. Clearly, a core part of Unilever's goal is to be truly global, so extending ideas and technologies is a core part of their innovation plan.

FINDINGS

No matter how well a company model the process, the design phase is always creative and intuitive. There is always a gap between abstract brand and concrete product that can only be bridged by creativity.

If the brand is created well, its manifestations (communication, environments, products) follow more automatically. Extending this line of reasoning: how easy BDI is for product designers depends on how the brand is defined in the organization.

CONCLUSION

Literature review, interviews with practitioners and academics and an assignment done by 700 Strategic Product Designers have led to the following conclusions:

1. There is a great need to bridge the gap between branding and new product development in a way that helps designers to translate brands into products.
2. There is no method available for this translation.
3. A new Brand Driven Innovation (BDI) method should start from the brand, put this brand in a format that can be used by designers, and then proceed to generate product concepts. Only then a selection should take place on the basis of internal and external criteria.
4. This BDI method requires a new way of defining the company's brand. This new brand format must be a fruitful platform for product innovations that designers find easier and more natural to work with than traditional brand definitions.

Not many NPD project assignments will start as BDI project. They might evolve that way over time though. In those cases the product designer can have a significant influence on the brand. Product development itself impacts the brand. But it is also impacted by helping the client answer the questions that are generated through the initiation of NPD projects (why does your brand need this product? how does this product match your brand? if this is what you stand for, shouldn't we develop this product?).

REFERENCES

- [1] Aaker, D. (1996) Building strong brands. Simon & Schuster, London.
- [2] Aaker, D. and Joachimsthaler, E. (2000) Brand leadership. Simon & Schuster, London.
- [3] Borja de Morzota, B. (2003b) Design management, using design to build brand value and corporate innovation. Allworth press, New York.
- [4] Buijs, J. and Valkenburg, R. (2005) Integrale productontwikkeling. Lemma, Utrecht.
- [5] Cooper, R. and Press, M. (1995) The Design Agenda. John Wiley and Sons, West Sussex.
- [6] Crawford, M. and Di Benedetto, A. (2006) New products management, McGraw Hill, New York.
- [7] Davis, S. and Dunn, M. (2002) Building the brand driven business. Jossey Bass, San Francisco.
- [8] Desmet, P. (2002). Designing emotions. Dissertation Delft University of Technology, School of Industrial Design.
- [9] Dundon, E. (2002) The Seeds of Innovation: Cultivating the Synergy That Fosters New Ideas, American Management Association.
- [10] Ellwood, I. (2000) The essential brand book. Kogan Page, London.
- [11] Franzen, G. and Bouwman, M. (2001) The mental world of brands. World Advertising Research Centre, Henley-on-Thames.
- [12] Funcke, J. (2005) Merkworke. Pearson Education, Benelux.
- [13] Gibson, W. (2003) Pattern Recognition. G. P. Putnam's Sons, New York. Peters, T. (2003) Re-imagine. Dorling Kindersley Ltd, London.
- [14] Roozenburg N.F.M and Eekels J. (1998) Productontwerpen, Structuur en Methoden, Lemma, Utrecht.
- [15] Treacey, M. and Wiersema, F. (1997) The Discipline of Market Leaders, Perseus Books Group, Jackson. Yin, R.K. (2003) Case study research, design and methods, 3d edition, Sage publications, London.

Corporate Social Responsibility in Rural Development Sector: Efforts of HINDALCO Industries Limited

Shishir Pandey¹ and Praveen Kumar Singh²

¹Assistant Professor, Guru Ghasidas University, Bilaspur, C.G.

²Student, SSIM, Moradabad, U.P.

Abstract—The paper attempts to explore Corporate Social Responsibility (CSR) practices particularly in the context of rural development. The research questions examine do the corporate consider rural people. What CSR initiatives taken for development of rural areas and how the corporates implement their CSR initiatives as a part of their business strategy? Finally it evaluates impacts of CSR actions on the socio-economic development of rural people. For the purpose, HINDALCO Industries Limited has been selected to study their CSR practices in the context of rural development. The methodology of the present study relied on the web-based research, review of print literature and visit to the selected sites to witness CSR practice. The paper concludes that social responsibility is regarded as an important business issue of HINDALCO irrespective of size, sector, and business goal. Therefore, CSR actions have positive impacts not only on development of rural community but also in their business. The authors reveal some lesson on CSR practices in India which can provide guidance to corporate entities for better implementation of CSR activities.

Keywords: Corporate Social Responsibility (CSR), Rural Development, HINDALCO

INTRODUCTION

No doubt, vast majorities of the India's poorest people lives in villages and these villages are in a state of neglect and underdevelopment with impoverished people. The problems of hunger, ignorance, ill health, high mortality and illiteracy are most acute in rural areas. This is not only because of shortage of material resources but also because of defects in our planning process and investment pattern. India has the potential to meet these challenges in rural areas. However, the efforts of Governments may not be adequate to provide basic services to its citizens. It is being increasingly recognized that progress and welfare of a society is not only the responsibility of the Government alone, but many more stakeholders need to be involved to attain the development goal (Save the Children Sweden, 2007).

The corporate sector has a pivotal role to play in ensuring private investment flows to those rural areas that have been left out of the development process so far and also to work for sustainable development of rural areas in general.

Over the past few years, as a consequence of rising globalization and pressing ecological issues, the perception of the role of corporates in the broader social context within which it operates, has been altered.

Corporates considers themselves as an integral part of society and accordingly act in a social responsible way that goes beyond economic performance (KPMG and ASSOCHAM, 2008). As a result of this shift from purely profit to profit with social responsibility, many corporate are endorsing the term 'Corporate Social Responsibility (CSR)'. It is essentially a concept whereby companies decide voluntarily to contribute to the society to make it better and environmentally cleaner (European Commission, 2001). Generally, CSR is understood as "the commitment of business to contribute to sustainable economic development by working with employers, their families, the local community and society at large to improve their quality of life, in ways that are both good for business and good for development. A widely quoted definition by the World Business Council for Sustainable Development state that "Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large" (WBCSD, 1999). Thus, the meaning of CSR has two fold. On one hand, it exhibits the ethical behavior that an organization exhibits towards its internal and external stakeholders. On the other hand, it denotes the responsibility of an organization towards the environment and society in which it operates. CSR is regarded as vehicle through which companies give something back to the society. It involves providing innovative solutions to societal and environmental challenges. But the challenge for development professional and business community is to identify CSR priorities and the areas of interventions which are meaningful in the context of rural development sector.

Therefore, there is a need to study and understand how corporate enterprises are using CSR initiatives and what is the impact of CSR actions on socio-economic development of people in rural areas. Divided into four sections, the present paper shall review literature related to CSR practices of corporate enterprises in section one. Section two describes the present study which includes objectives, methodology and limitations of the study. Section three discusses important results and section four concludes the study.

LITERATURE REVIEW

Historically, CSR has been viewed as developed countries' phenomena. As such a large body of literature on CSR practices has merged in the context of developed countries. However, literature on the theory and practices on CSR in the developing countries remains scant (Belal, 2001). Hardly a few studies have looked at CSR practice in India. Different researches at different points of time and classical Indian literature have emphasized the CSR practice of corporate entities in India. A long back Kautilya in his 'Arthashastra' mentions traders responsibilities to the local society. In ancient India, such responsibilities were voluntary and not mandatory.

Khan and Atkinson (1987) conducted a comparative study on the managerial attitudes to social responsibility in India and Britain. The study shows that most of the Indian executives agreed CSR as relevant to business and felt that business has responsibilities not only to the shareholders and employees but also to customers, suppliers, society and to the state. A survey by TERIE urope and ORG-MARG (2001) in several cities in India revealed that more than 60% of the people felt that the companies should be held responsible for bringing down the gap between rich and poor, reducing human rights abuses, solving social problems and increasing economic stabilities. Some of the surveys like 'Corporate involvement in social development in India' by Partners In Change (PIC), Altered Image: the 2001 State of Corporate Responsibility in India Poll by Tata Energy Research Institute (TERI), Corporate

Social Responsibility: Perceptions of Indian Business by Centre for Social Market (CSM), and 'Corporate Social Responsibility Survey, 2002, India presented jointly by the British Council, UNDP, Confederation of Indian Industries and Price Water house Coopers have also highlighted the emerging Indian participations in the CSR process. The findings of these surveys emphasized companies across India reveal that philanthropy is the most significant driver of CSR, followed by image building, employee morale and ethics respectively.

Centre for social markets (2003) conducted a study in which it was found that social responsibility is seen to be an important business issue within the sample firms, irrespective of firm size, age, sector, location, primary purpose or legal status.

A study on iron ore mining industry in Goa shows that many large mining companies have their own initiatives towards environmental and social development.

However, a structured CSR policy and planning is missing especially among the small and medium players in the industry (Conway, 2003). Arora and Puranik (2004) reviewed contemporary CSR trends in India concluding that the corporate sector in India benefitted immensely from liberalization and privatisation process, its transition from philanthropic mindsets to CSR has been lagging behind its impressive financial growth.

Verma and Chauhan (2007) found that roads, pollution and power are the major concern of corporate CSR activities as compared to least concern area which is communication and education. Another study by Dutta and Durgamohan (2009) found that education takes the first place followed by health and social cause. Similarly, a survey conducted by CSM (2001), the perception of companies towards various parameters of CSR has been brought forward. The various dimensions of CSR valued by companies are national wealth, employment, environment and social programme including health and literacy. In a survey of CSR reporting in Asia Chapple and Moon (2005) found that nearly three quarters of large companies in India present themselves as having CSR policies and practices. The EU green paper (2001) identifies two main dimensions of companies implementing CSR an internal dimension relating to practices internal to the company and an external dimension involving stakeholders.

The above findings of different scholars at different points of time entail that they have rightly observed and underscored the CSR practices and performance of companies in India. But little attention have been paid on this aspect that do the companies consider rural people as stakeholders? If yes, what CSR initiatives being taken for rural development? How the Corporate entities implement development programmes as a part of their business strategy? Finally, what is the impact of CSR programs on socio-economic development of rural population in India?

THE STUDY

In an effort to understand the answers to the above questions, the present study was undertaken HINDALCO Industries Limited.

OBJECTIVES OF THE STUDY

The main objectives of the study were:

1. To study and understand the CSR initiatives being taken by HINDALCO Industries Limited for rural development;
2. To examine the corporates' approach to work and their mode of action for implementation for CSR initiatives;
3. To assess the impacts of CSR actions on socioeconomic development of rural population in India.

METHODOLOGY

To study the above objectives, HINDALCO Industries Limited has been selected.

The methodology of the present study relied on the webbased research, review of print literature to understand CSR practice within the context of rural development in India. For the purpose of analysis CSR initiatives for rural development were classified under five areas: livelihood, health, education, environment and infrastructure.

RESULTS AND DISCUSSION

Long before corporate social responsibility found a place in the corporate lexicon, it was already textured into the Group's value system. As early as the 1940s, the late Mr. G.D. Birla espoused the trusteeship concept of management — investing a portion of the company's profits for the larger good of society. The late Mr. Aditya Birla went beyond chequebook philanthropy when he brought in the concept of 'sustainable livelihood'.

For over 50 years, Hindalco has worked in the hinterlands of India to better the quality of life of the underprivileged sections of society.

Today, HINDALCO reach out to millions of people in the villages, of whom more than 60 per cent live below the poverty line. Their needs include: access to water, agriculture and sustainable livelihood, healthcare, and education. These four areas form the focus of our efforts.

The company also works to bring about social reform through widow re-marriage and dowerless marriages. HINDALCO works in partnership with government agencies and the beneficiaries to provide these necessities and encourage social reform.

CSR IN FOCUSED AREA BY HINDALCO INDUSTRIES LIMITED

Health care

- Medical camps: Taking mobile medical units and providing ambulance service to remote areas.
- Health facilities: Setting up well-equipped and professionally manned health centres at several locations.
- Regular health camps: Providing family planning, mother and child care and specialised camps for eye care and for cataract; coordinating regular pulse polio immunisation drives; and promoting the awareness, prevention and treatment of malaria, water-borne diseases, TB, HIV/AIDS, and others diseases.

Education

- Balwadis: Providing for the primary education of underprivileged children.
- Adult literacy: Providing formal and informal classes and active support to the government's mission to improve rural literacy levels.
- Merit scholarships/ Schemes: Support female students for educational endeavours.
- Educational support: Contributing uniforms, textbooks and classroom equipment and undertaking school building construction and maintenance.
- Skills training/ capacity building
- The Aditya Birla Rural Technology Park (Muirpur, Uttar Pradesh, India): Runs over 70 training programmes in diesel / hand pump repair / maintenance, electrical repair/maintenance, bee-keeping, tailoring, knitting and agriculture-related programmes and encouraging self-employment through income-generating projects.
- The Yashogami Skills Training Centre (Radhanagari, Tarale, Maharashtra, India): Trains women in skills such as rexine handicraft, fashion design, tailoring, food processing, pottery, lamination, electronics assembly, zardozi, jewellery design, papier mache, rangolli, and fabric design.

Women's Empowerment

Self-Help Groups (SHG)

These programmes involve over 11,000 women from rural communities around Hindalco units.

SHG Activities

Micro credit and micro finance schemes, entrepreneurship building, oil-processing units, tailoring centres, horticulture and nutrition gardens, diesel and hand pump repair, vermi compost production, mushroom cultivation, food processing, etc.

Awareness Building

Health and sanitation, family planning, literacy drives and microfinance; facilitating government loans for small-scale enterprise and rural insurance schemes, etc.

Social Causes

Promoting dowerless marriages and widow re-marriages.

AGRICULTURAL SUPPORT

- Irrigation schemes: Land brought under irrigation with better yield and multi-cropping methods.
- Watershed development: Hydel towers, drainage canals, wells, check-dams, pedal pumps and harvest tanks.
- Training: Field schools train local farmers in modern agricultural techniques for higher crop yield; introducing lac cultivation, post-harvest technology with safe grain storage through an integrated pest-management system, floriculture, horticulture and kitchen gardens; shifting from mono to multi cropping patterns and distribution of high-yield seeds.

CONCLUSION

The conclusion of this study is that social responsibility is regarded as an important business issue of HINDALCO Industries Limited irrespective of size, sector, business goal, location of the company. Because HINDALCO Industries Limited are realizing that without socio-economic development of the local communities, there can be no stability and sustainability for doing business so as to compete with the global market. The study shows that all surveyed HINDALCO Industries Limited presents them as having CSR policy and practices. Most of the companies which design and implement CSR initiatives in the vicinity of their works cover entire community. A wide range of CSR initiatives ranging from income generation activities for livelihood, health check-up camps, mobile health services, education, adult literacy, agricultural development, provision of drinking water, management and development of natural resources, infrastructure facilities being carried out by these companies. Though the approach to work is generally shifting from philanthropic to welfare and sustainable development but no link was observed between the company's CSR agenda and Millennium Development Goals. Many companies promote and implement CSR initiatives through Human Resource Department, foundation or in partnership with NGOs, but do not have full fledged CSR department. CSR initiatives being implemented by the Indian companies for rural development have a positive impact in overall development of society and their business. However, following points must be considered to continue on sustained basis for the betterment of both the people at large and the business.

REFERENCES

- [1] Arora, B. and Paranjik. (2004). "A Review of Corporate Social Responsibility in India",
- [2] *Development*, 47 (3), pp.93-100.
- [3] Belal,A.T. (2001), "A Study of Corporate Social Disclosures in Bangladesh", *Management Auditing Journal*, 16 (5), pp.274-288.
- [4] Conway, C.(2003), "Tracking Health and Well being in Goa's Mining Belt", Case Study 5, Ecosystem Approach to Human Health, International Development Research Centre, Canada.
- [5] Chappel, M. and Moon, J.(2005), "Corporate Social Responsibility(CSR) in Asia: A Seven country study of CSR",*Business and Society*,44(4),pp415-441.
- [6] Dutta, K. and Durgamohan, M. (2009), "Corporate Social Strategy: Relevance and pertinence in the Indian Context" retrived on 6th April, 2009 from www.iitk.ac.in/infocell/announce/conversion/papers.
- [7] European Commission, (2001), "Promoting a European Framework for Corporate Social Responsibility", Commission of the European communities, available on www.btpic.com/
- [8] [society/society & environment/records/ greenpapers_csr.pdf](http://www.btpic.com/society/society%20&%20environment/records/greenpapers_csr.pdf).
- [9] <http://www.adityabirla.com/careers/csr.asp>,retrived on 12th December, 2008.

paper as well as other BPO and IT outsourcing companies. India will clearly be a world leader with sustainable competitive advantage very soon. Additional opportunity will be developed as it relates to cloud based support utilizing technical support opportunities via the inter, while much of this is being conducted already the bandwidth for additional business will continue to grow exponentially, with still very reasonable expenses and a stable government many Western organizations are looking aggressively at India and will continue to do so.

ACKNOWLEDGEMENT

The authors would like to acknowledge and thank Carlan Taft for the research assistance.

REFERENCES

- [1] Aegis. (2012). Accessed 2 February 2012 http://www.aegisglobal.com/section_level1.aspx?com_id=R+shTxeYnUs
- [2] Bajpai, N. (2002). A decade of economic reforms in India: the unfinished agenda (working paper N0.89.) Center for International Development at Harvard University, Retrieved May January 16, 2012, from <http://www.cid.harvard.edu/cidwp/089.pdf>.
- [3] Bhasin, P. (2011). Building an Industry in India from Scratch. *Harvard Business Review*, 89 (6), 45–48.
- [4] Business Standard. (2011). Q&A: Keshav Muruges, Group CEO, WNS Global Services. Accessed 26 January 2012. www.business-standard.com/india/
- [5] Business Standard. (2012). TCS Ranked as a Leader in Application Outsourcing in Capital Markets. Accessed 26 January 2012. www.business-standard.com/india/
- [6] Business Today. (2011). Old Economy Muscles In. Accessed 2 February 2012 <http://businesstoday.intoday.in/story/aegis-from-the-essar-fold-aditya-birla-minacs-bpo/1/19235.html>
- [7] Business Today. (2009). Wipro's bagful of Ideas. Accessed 26 January 2012 <http://businesstoday.intoday.in/story/wipros-bagful-of-ideas/1/4897.html>
- [8] Butcher, C. (2011). Das capital. *Lawyer*, 25(13), 20
- [9] CNBC. (2012) India's Wipro to Thrive in Challenging Times: CEO Accessed 2 February 2012 www.cnbc.com/id/46127395/
- [10] Country of India. (2009). Retrieved Nov 29, 2011, from nationmaster: www.nationmaster.com/country/in-india
- [11] Datamonitor 2011. Tata Consultancy Services Limited. Accessed 28 January 2012 www.datamonitor.com
- [12] Datamonitor 2011. Wipro Limited. Accessed 28 January 2012 www.datamonitor.com
- [13] Doing Business in India. (2009). Retrieved Nov 29, 2011, from kwintessential: www.kwintessential.co.uk/etiquette/doing-business-india.html
- [14] Financial Express. (2011). WNS Global Services forays into domestic BPO market. Accessed 31 January 2012.
- [15] Genpact Corporate Profile. (2010). Accessed 28 January 2012 <http://investors.genpact.com/phoenix.zhtml?c=209334&p=irol-reports&other>
- [16] global information technology. (2009). Retrieved 12 1, 2011, from weforum: www.weforum.org/issues/global-information-technology
- [17] Globalization. (2010). Retrieved Nov 30, 2011, from Maps of India: business.mapsofindia.com/india-industry/
- [18] Harris. (2010) There are No Shortcuts to Excellence. Accessed 1 February 2012. www.astd.org/TD
- [19] India Facts. (2009). Retrieved Nov 30, 2011, from indiavision: www.indiavision.com/indiafacts.html
- [20] India Facts. (2011). Retrieved Nov 24, 2011, from wikipedia: en.wikipedia.org/wiki/India
- [21] Kohli, J(Ed). (1996) The business guide in India, Singapore Butterworth Heinemann Asia.
- [22] Outsourcing locations in India. (2010). Retrieved Dec 4, 2011, from sourcingline: www.sourcingline.com/outsourcing-location/india
- [23] Tan, T.Low, A Williams, J & Zutshi, R (1996). *Business Opportunities in India* Singapore: Prentice Hall.
- [24] TCS Corporate Facts (2012). Accessed 26 January 2012. www.tcs.com/about/corp-facts/
- [25] The Times of India. (2011). We hope to beat IBM in India soon: Wipro. Accessed 2 February 2012 <http://timesofindia.indiatimes.com>
- [26] the world facts. (2010). Retrieved Nov 29, 2011, from CIA: www.cia.gov/library/publications/the-world-factbook/geos/in.html
- [27] Top 10 BPO Operations. (2011). Retrieved Dec 4, 2011, from chillibreeze.com: www.chillibreeze.com/articles/top10BPOcompaniesinindia.asp
- [28] Wipro. (2012). Accessed 29 January 2012 www.wipro.com/about
- [29] WNS. (2012). Accessed 29 January 2012. www.ir.wns.com/phoenix

Global Convergence of Accounting Standards: An Emerging Paradigm

Mohd Anam Akhtar¹, Ravindra Tripathi² and Khurram Ajaz Khan³

¹Research Scholar, Dept. of Humanities & Social Sciences, MNNIT, Allahabad

²Assistant Professor, Dept. of Humanities & Social Sciences, MNNIT, Allahabad

³Assistant Professor, Faculty of Management, JETGI, Barabanki, Lucknow

Abstract—With the process of globalization the distances are reduced and the boundaries are removed between the nations & a new concept of Multinational & Transnational organizations emerged with a number of large sized entities crossing boundaries and entering into different countries for doing business. Like in England its important to speak English similar is the case with language of business. Even though boundaries are crossed but each company is following a different set of accounting rules as per prevailing in the parent country. A number of companies turned to the big sized U S market and tried to be listed there but for listing requirements at U S it is very important for companies to convert their accounting standards as per the conditions laid by SEC & FASB even if they are following IAS which is a time and efforts consuming process such problems led to the need of Global Accounting Standards which could be used for global and national listings alike hence comes International Financial Reporting Standards popularly known as IFRSs. This paper gives a brief description of what exactly IFRSs are, why are they required and how they are going to be implemented in India.

Keywords: SEC (Securities and Exchange Commission), FASB (Financial Accounting Standards Board), IAS (International Accounting Standards), IFRSs (International Financial Reporting Standards).

BACKGROUND

The development of accounting standards is one of the landmarks of the history of evolution of corporate financial accounting and reporting. Accounting standards are the authoritative statements pronounced by professional accounting bodies that set norms, rules and principles for measurement and reporting of economic events of corporate enterprises. Accounting standards are now formulated in a number of countries but the institutional arrangements for setting such standards are different in different countries. For examples, the United Kingdom, Australia, New Zealand & India follow more or less the same pattern but the pattern followed in the U S, France or Germany is entirely different than these countries. Amongst all countries the standards setting process of the U S is considered to be the best due to its openness and rigour and also because it has issued more than 150 standards on important areas.

However at the International level the International Accounting Standards Committee (IASC) formed in 1973 through an agreement reached between professional accounting bodies from Australia, Canada, Germany, Japan and the U S has been playing a very important role ever since its inception. At present its membership comprises of more than 150 bodies from more than 110 countries. But the capital market regulator in the U S that is SEC (Securities and Exchange Commission) does not accept unconditionally the standards laid down by the IASC as rigorous enough and of high quality as that of FASB (Financial Accounting Standards Board) standard. As a result of this a foreign entity for the purpose of being listed in the U S stock exchanges had to prepare a set of financial statements in compliance of US GAAP (Generally Accepted Accounting Principles) or to prepare a reconciliation financial statement in compliance with U S GAAP. But both preparing a double set of accounts and preparing reconciliation statement in compliance with GAAP is a task that involves additional time, costs and efforts.

In 1995, the International Organization for Securities Commission (IOSCO) agreed to review IASC standards and consider enforcing the standards for cross border listings. This agreement was the result of growing recognition for the need for Global Accounting Standards (GAS) that could be used for cross border listings and national listings alike.

The IASB (International Accounting Standards Board) & FASB (Financial Accounting Standards Board) are now the two mighty standards setting bodies at the world level. In the year 2002, to promote convergence these two mighty bodies signed a Memorandum of Understanding (MOU) also known as Norwalk Agreement to adopt various initiatives.

Hence a restructuring of accounting standards at world level is going on which has led to the adoption of IFRSs.

WHAT IS IFRSS?

IFRS is a set of international accounting standards stating how particular types of transactions and other events should be reported in the financial statements. The basic purpose of such thing is to bring about uniformity in the language of business that is reporting. This will help in listing of companies across borders.

The term IFRSs in itself comprises of IFRSs as issued by the IASB, IAS issued by IASC, the interpretations issued by the Standing Interpretations Committee (SIC) and the International Financial Reporting Interpretations Committee (IFRIC) of the IASB.



Fig. 1

Need for IFRSs

The need for IFRSs arises because of the following reasons:

1. Accounting information's are used for the purpose of decision making process especially by the investors hence it is very important that the information could be derived out of the financial statements easily.
2. Along with the globalization business comes the globalization of the language of the business that is accounting.
3. Demand of high quality accounting information has increased over the period of time and will continue to do so in future also.
4. Globalization of the accounting is also a part of the complete globalization package which comprises of globalization of corporates, governance, culture etc.
5. To open up market for all investors and corporates also they can easily get themselves registered.

Convergence to IFRSs

1. The IFRSs issued by the International Accounting Standards Board (IASB) are increasingly being recognized as Global Reporting Standards.
2. More than 100 countries such as countries of European Union, Australia, New Zealand and Russia currently require or permit the use of IFRSs in their countries.
3. Inline with the global trend, the Institute of Chartered Accountants of India (ICAI) has proposed a plan for convergence with IFRSs with effect from April 1, 2011.
4. Convergence to IFRSs would mean India would join a league of more than 100 countries, which have converged with IFRSs.

Why Convergence to IFRSs

1. A single set of accounting standards would enable internationally standardize training and assure better quality on global screen.
2. It would also permit capital to flow more freely, enabling companies to develop consistent global practices on accounting problems.
3. It would be beneficial to regulators too, as complexity associated with needing to understand various reporting regimes would be reduced.

Meaning of Convergence with IFRSs

1. Convergence means to achieve harmony with IFRSs; in precise terms considered "to design & maintain national accounting standards in a way that financial statements prepared in accordance with national accounting standards draw unreserved statement of compliance with IFRSs", i.e. when the national accounting standards will comply with all the requirements of IFRSs.
2. But convergence doesn't mean that IFRSs should be adopted word by word, e.g., replacing the term 'true and fair' for 'present fairly' in IAS 1, 'Presentation of Financial Statements'. Such changes do not lead to non convergence with IFRSs.
3. The IASB accepts in its 'Statement of Best Practice: Working Relationship between the IASB and other Accounting Standards Setters' that "adding disclosure requirements or removing optional treatments do not create non-compliance with IFRSs. But additional disclosures or removing of optional treatment should be made clear so that users of IFRSs are aware of the changes.

Some Notable Efforts World Wide to Enforce IFRSs

European Union

The seventh directives relate to consolidation of financial statements and adoption of this directive was a notable event in the history of consolidation of accounting. National laws requiring implementation of the directives were to be enacted by 1988 and made operative from 1990.

In this context a reference to the standards issued by the IASC becomes imperative since these standards accelerated the harmonization process in many countries of the European Union. In 1976, it issued IAS 3, Consolidated Financial Statements. Two notable areas viz., merger accounting and treatment of goodwill, where practices varied widely amongst the EU companies were left out. Later IAS issued more comprehensive set of standards e.g., IAS 22, Acquisitions and Mergers (amended in 1993 and 1998), IAS 27 to replace IAS 3, IAS 28 Associated Companies and IAS 31, Joint Ventures. These IASs on group accounting directly affected many countries in the EU where domestic rules are based on IASs. Many major European Countries e.g., France, Germany, Italy, and Switzerland, followed IASs, particularly for their group accounts.

Thus, the introduction of the fourth and seventh Company Law Directives improved the comparability of accounts of listed companies and hence the conditions for crossed border business. On January 7, 2002, and the European Union announced the requirement to use IASs in the consolidated accounts for the financial years starting on and after January 1, 2005. Accordingly the listed companies in the EU prepared their consolidated accounts in accordance with IFRSs.

Australia

Initial approach commenced in 1996, to selectively harmonize and converge. Australia adopted IFRSs from January 1, 2005. In Australia, Australian Accounting Standards Board (AASB) set accounting standards and the Financial Reporting Council (FRC) play several important roles including strategic insight of the accounting standard setting process. Australia is also one of the countries which were working for convergence of national standards with a single set of accounting standards. The Chairman of FRC made an announcement in July 2002 that the FRC has issued a directive to the AASB for the adoption by all reporting entities in Australia of IFRSs by January 1, 2005, the decision was also affected by the decision of the EU.

Canada

The Accounting Standards Board of Canadian Institute of Chartered Accountants (CICA) published a proposed plan for its activities over the next five years (CICA 2005). This plan calls for the Board to converge Canadian GAAP with IASB GAAP by amending or replacing Canadian Standards that do not conform to IFRSs or IASB and adopt new IFRSs hopefully from 2011. The Board is working in collaboration with FASB and IASB to enforce IFRSs.

China

China is the economy maintaining the highest GDP growth rate across the globe over the last decade and is the biggest competitor to India in becoming a global super power. Initially China followed a soviet system of accounting as it followed the concept of state owned economy until it began its open door policy in 1978. The first Accounting Standard, the Accounting Standards for Business Enterprises (ASBE) was issued in 1992 and became operative from July, 1993. The ASBE applied to all Chinese business enterprises and superseded all accounting regulations promulgated earlier. All enterprises regardless of their ownership structure are brought under one common accounting frame work. The introduction of ASBE brought an end to soviet style of accounting followed in China and put it in close proximity with the international accounting standards. The Ministry of Finance (MOF) is responsible is for framing accounting standards in China it is assisted by China Accounting Standards Committee (CASC).

A review of the Accounting Standards setting system from 1993 to 2004 reveals that China's accounting system under vent a transition to a modern accounting system with significant convergence to IFRSs. The reformed and expanded capital market was the ultimate driving force. China agreed to adopt IFRSs from January, 2007 in a faced manner:

1. Where business transactions are identical to those regulated by IFRSs and so are the environments. China should actively improve convergence with IFRSs and even directly adopt IFRSs.
2. Where the business transactions are identical to those regulated by IFRSs but due to special environment in China, the economic substance is not exactly the same, China should not duplicate IFRSs but should establish standards based on the transactions' economic substance.
3. Where business transactions regulated by IFRSs are common in countries with developed market oriented economies but not in China, China should not directly duplicate IFRSs until such transactions are more common.
4. Where business transactions are specific to Chinese environment and are not addressed by IFRSs, China needs to develop specific standards to regulate the related accounting practices.

India

As a member of IASC, India has been following a systematic procedure for framing accounting standards since 1979 through Accounting Standards Boards (ASB) of the Institute of Chartered Accountants of India (ICAI). So far, ICAI issued 32 accounting standards. During initial phase the standards were recommendatory but now all have been made compulsory. Now the statutory auditor has to certify that the financial statements of a company comply with the accounting standards. There are substantial difference between the accounting standards in India and IFRSs thus there is a need for convergence. Being influenced by the convergence process going on in a number of countries ICAI also decided to follow suit. Accordingly ICAI, has decided that all public interest entities should adopt IFRSs from the financial year commencing from 1st April 2011.

Roadmap for IFRSs in India

1. Companies with a net worth of Rs1000 crore and those which are a part of BSE Sensex, Nifty and companies listed in overseas exchanges. (April 2011)
2. All companies with a net worth between Rs 500-1000 crore. (April 2013).
3. Banks and Non-Banking Financial Companies (NBFC). (April 2013).
4. All listed companies with a net worth of Rs 500 crore or less. (April 2014).

Keeping in view the complex nature of IFRSs, and the extent of difference with the existing Accounting Standards and the corresponding IFRSs therefore the ICAI is of the view that IFRSs should be adopted by **public interest entities**. Fig. 2

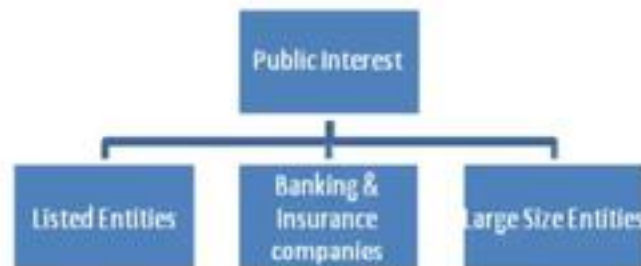


Fig. 2

The Public Interest Entities

1. whose equity or debt securities are listed or in the process of listing on any stock exchange in or outside India,
2. which is a bank (including a cooperative bank), financial institution, a mutual fund, or an insurance entity,
3. whose turnover (excluding other income) exceed Rs 100 crore in the immediately preceding accounting year,
4. which has public deposits or borrowings from financial institutions in excess of Rs 25 crore any time during the immediately preceding accounting year,
5. Which is a holding or subsidiary of the entity mentioned as per points 1 to 4?

Benefits of Convergence to India

1. Convergence with IFRSs eliminates multiple reporting such as per Indian GAAP, and U S GAAP.
2. This will result in more transparent reporting of a company's activities which will benefit customers, investors and other key stakeholders.
3. Convergence with IFRSs will enable Indian entities to have easier access to global markets and also eliminate barriers to cross border listings.
4. It would also lead to more capital inflows to India.
5. IFRSs will also give more comparability among sectors, countries and companies.
6. Financial Statements prepared using a common set of accounting standards help investors better understand investment opportunities as opposed to financial statements prepared using a different set of national standards.
7. Historical Costs will be substituted by 'fair value' for several balance sheet items which will enable a corporate know its true worth.
8. Convergence to IFRSs will also increase the opportunities for Indian Professional abroad as they will be able to sell their services as experts in different parts of the world.
9. Currently companies need to prepare additional financial statements to raise funds from international markets this will no longer be needed so there by saving time, efforts and money.
10. Better quality of financial reporting due to consistent application of accounting principles and improvement in reliability of financial statements.

Challenges of Convergence

1. For the success of convergence in Indian environment certain regulatory amendment is required; for e.g., The Companies Act (Schedule 6) prescribes the format for presentation of financial statements for Indian companies whereas the presentation requirements are significantly different under IFRSs so the companies act needs to be amended in line with IFRSs.
2. Adoption of IFRSs by approximately 5000 listed companies by 2011 would result in a significant demand for IFRSs resources. Corporate India and accounting professionals need to be trained for effective migration to IFRSs. Additionally auditors would need to train their staff to audit under IFRSs environment.
3. Educating stakeholders, comprising of investors, lenders, employees, auditors, audit committee etc would be a big challenge as this would require considerable time, efforts and cost too.
4. Under IFRSs companies would need to increasingly use fair value measures in the preparation of financial statements. Companies' auditors, users, and regulators would need to get familiar with fair value measurement techniques.
5. Due to the significant differences between Indian GAAP and IFRSs, adoption of IFRSs is likely to have a significant impact on financial positions and financial performance of most of the Indian companies.
6. There are also some conceptual differences between the present accounting standards being followed by the Indian firms and IFRSs as for e.g., the Indian standard on intangibles is based on the concept that all intangible assets have a definite life which cannot generally exceed 10 years while IFRSs acknowledges that certain intangible assets may have intangible lives and useful lives in excess of 10 years are not unusual.

CONCLUSION

Hence though IFRSs is a buzz word and is adopted by more than 100 countries across the globe and many others including India are all set to adopt them, though they also offer a number of benefits and globalization of accounting standards in true sense but they also have a number of concerns like training, cost, efforts and most importantly the impact on profitability.

REFERENCES

- [1] Accounting Standards and IFRSs by Kamal Garg (C A) 2009 edition.
- [2] Bannerjee B. (2009) 'Global convergence of accounting standards: review of recent trends and some issues' Indian Accounting Review volume 13.
- [3] Bannerjee B. (2002) Regulation of Corporate Accounting and Reporting In India, the World Press Pvt. Ltd.
- [4] Basu A. K. (2008) 'Accounting Standards and standard regime in India' IAA Research Foundation.
- [5] Feng Shuping (2004) 'China's basic attitude towards the international convergence of accounting standards and related issues' Accounting Research volume 1.
- [6] IFRSs Concepts and Applications by Kamal Garg (C A) 2010 edition.
- [7] IFRSs, US GAAP, INDIAN GAAP, SOX-A Compilation by Mohan R. Lavi 2009 edition.
- [8] Practical guide to IFRSs by Dr. Sanjeev Singhal & Krishna Kant Tulshan 2009 edition.
- [9] www.iasb.org
- [10] www.iasb.org
- [11] www.icaai.org
- [12] www.iasplus.com
- [13] www.google.com

RTI—The Harbinger of a Silent Revolution

Yogendra Pal Bharadwaj¹ and Parvez Alam²

¹Student, BBA, AMU Aligarh

²Computer Section, Maulana Azad Library, AMU, Aligarh

Abstract—One of the best ways to provide legitimacy to the government is through transparency. This transparency can be achieved through various ways and one of them is RTI. RTI has been enacted in India in 2005. It has been potent tool in the hands of 'hoi polloi'. No need to say that RTI has further strengthened the cause of democracy and democratic rights in this country. The war against various systematic evils unleashed in the wake of RTI which has been termed as 'The Third War of Independence'. RTI is a sine quo non of democratic polity. Dr. Amartya Sen describes it as "Momentous engagement with the possibilities of freedom". A high order judicial activism is also necessary regarding the implementation. If it succeeds in its purpose, it will necessarily increase public participation. If through persistence and innovation, the RTI can be made to work effectively, then India will become a model of dozens of other countries in the developing world.

Keywords: RTI, transparency and accountability, Information, Indian Legislation.

INTRODUCTION

It has been famously said, that "People should not be afraid of their governments, governments should be afraid of their people". We the people of India, have been protected from such a fear by the safeguards that our constitution provided for us – both as rights, as well as protocols. But as the years after independence passed by, excessive bureaucracy, red-tapism, and the lack of a proper mechanism meant that accountability and transparency became forgotten words with respect to our administration. And all of a sudden the RTI application makes it possible to overcome it within a short period of time.

Despite stiff resistance, the movement for right to information revolution in the country is pitching in India has had two revolutions – one was the 'green' one and the other 'white'. While these two were restricted to a few areas of the country, the third revolution encompasses all areas of the country. It may be most colorful of all bringing all hues of democracy deep down into the society. It remains to be seen how and when the government wakes up to realize its potential.

As we say, information is necessary to form, perform, conform and reform. It is so basic to any aspect of human existence, be it learning or acquisition of knowledge, performance of one's duties or any activity, compliance to any rules or laws and reform in any system subsequent to revelations of deficiencies discovered and changes required.

RTI: A POTENT TOOL IN THE PEOPLE'S HANDS

It is subsequent to this realization that right to information Act (RTI-Act) was enacted way back in 2005 in our country. Since its enactment in 2005, RTI has become a potent tool in the hands of hoi polloi and it has used this Act to further the cause of democracy and democratic rights in this country. The principles of natural justice also subsume the right to fair hearing which presumes a right to information.

The various powers and rights accruing to common people under the Act have been widely used, with positive implications for effective governance in this country. The government and its sundry administrative wings have literally been on toes in the past few years providing various kinds of information to different classes of people. The war against various systematic evils unleashed in the wake of RTI has been termed as the 'Third war of Independence'. The conservative bureaucracy can no longer hide behind the fig leaf of the official Secrets Act, 1923 to deny information to the citizens unless the same could be justified in strict public interest.

It has also been part of global discovers due to its inclusion in various international instruments and conventions including the universal Declaration of Human Right, 1948 and in the Acts / laws of many developed countries. In fact, for any law or Act to be effective in a democracy, it is very important that the common public is duly informed about various aspects and provisions. Not only that, these people should also be conscious and conscientized about the need to use their various rights and powers available under the act and RTI is no different.

The common people of this country have not only been greatly empowered by the Act, but they are also gradually learning to use the same reflectively resulting in more democratization of the system. With the increased popular participation made possible by the Act, the overall accountability in the system has also increased remarkably. As almost any and every information is now in public domain, the wily government servant thinks twice before doing any thing wrong as he/she is aware that tomorrow he/she might have to account for or explain the action/decision taken by him/her.

Restrictions Under Indian Law on Right to Know

There are laws which are contrary to the right to know in India and need to be amended in order to preserve the right to know. Sections 123, 124, and 162 of the Indian Evidence Act are few exceptions to right to know which provide to hold the disclosure of documents.

Legislation in India for Right to Information

India might be a super power in IT Sector but still 63 years have passed after independence, the government has never been serious on legislating on right to know merely declaring that Right to know is a constitutional right will not do. There is an utmost need to practically apply this right. In the year 2002 the Indian parliament passed the freedom of information Act. After obtaining the assent of President this bill could not come into force due to the want of a notification of by the central government.

The bill being unable to fulfill the purpose, the UPA government, in the year 2005 enacted a new legislation on the same with the title "Right to Information Act 2005", which came into effect from October 12, 2005. The procedure for asking information is very simple; anybody can make a request on plain paper in writing with a nominal fee and the information as per the act needs to be provided in within 30 days of such request. Many states have established state information commissions for appealing purposes. A center information commission is also established under the act.

More Transparency and Accountability

The RTI Act has definitely made the administration more transparent and accountable than it ever was. The basic features of good governance include transparency, accountability and predictability. After the enactment of RTI, these parameters could clearly be seen to be writ large across the governance system in this country. Still, there is a lot which needs to be done to make this Act further effective.

First of all, voluntary disclosure of information and appointment of public Information officers (PIOs) as warranted under respective sections 4 and 5 of the Act by various agencies have still not been done suitably and properly. Section 4, sub-section-2 of RTI Act says, "It shall be a constant endeavour of nearly public authority to take steps in accordance with the requirements of clause (b) of subsection (1) to provide as much information suo-motu to the public at regular intervals through various means of communications, including internet, so that the public have minimum resort to the use of this Act to obtain information".

RTI actually implies the 'Theory of Full Belly' i.e. if someone's stomach is full, he/she would never ask for food similarly, if information is provided suo-motu, people shall never resort to RTI – Again, Section 5, sub section 1 of RTI Act says, "Every public authority shall, within one hundred days of the enactment of this Act [i.e. 21st June, 2005] designate as many officers as the Central public Information officers or state public Information officers, as the case may be in all administrative units or offices under it as may be necessary to provide information to persons requesting for the information under this Act."

So, it is important that to realize the objective of this Act, the spirit behind this section are realized and actualized as early as possible. Not with standing the fact that there are approximately 50 lakh public authorities in the country, still, these SPIOs and ASPIOs (State public Information officers and Assistant State public Information officers) have not been notified by many of them. And where they have been so notified they have not been suitably publicised, resulting in confusion and inefficiency in the disposal of the RTI petitions. At many places, there is a single SPIO for the entire organization, something which makes the system very cumbersome because of dependence on a lone person. So, the onus could be suitably and conveniently apportioned among many SPIOs for better performance and speedier disposal.

While in the beginning, the public authorities would complain against the paucity of funds to take various measures as required by the Act including voluntary disclosure of information. However, now there are enough contingent funds under different schemes which could be suitably utilized to realize this basic prerequisite to make RTI more effective. As there is always shortage of manpower for such work, it won't be out of place to suggest outsourcing of such works. The massive amount of work required towards voluntary disclosure of information could be better executed by professional agencies stilled in such tasks.

Knowledge levels of RTI Act across the fine States (% of people who responded YES to the questions) see Table: 2 and 3

Quality, Not Quantity of Information Needed

The care, however, should be taken to ensure that the information is easy to understand and is provided through suitable linguistic media. Even though we have come a long way in implementation of RTI in this country; there is still considerable lack of awareness among public and public servants regarding various aspects and provisions of the Act. The ignorance is reflected in the kinds of petitions filed and the responses of various public authorities. Many of the petitions filed have been found to be motivated. The political parties, as one could say with experience, often use it to literally annoy the local administration e.g. loads of RTI petitions if you don't listen to them or accede to one or the other of their demands.

While the brief of the Act is to supply the information available in public domain, people have actually been seeking action and justice under the Act which is not the brief of the Act. Many of the petitions are filed without any purpose or locus standi. More often than not, the way RTI petitions are filed or the way information is sought also creates confusion among the public authorities who themselves are often not clear as to how to deal with such petitions. Though anyone and everyone could seek any and every information in the public domain, the information not readily available and which involve disproportionate diversion of public resources need not be provided as per section 7, sub-section 9 of the Act.

Public authorities need more infrastructures for implementation of RTI Act



% of PIOs who mentioned need for more infrastructures for implementation of RTI Act

In fact, the public authorities could save a lot of their time and energy dealing with such petitions if only they could comply with the directions enshrined in Section 4 relating to voluntary disclosure.

A good website or kiosk shall do the needful in this regard. The petitioner could just be informed about the website, if one is computer savvy, to access the information required. And for the non computer savvy ones, the hard copies of such information should be made available in the local libraries. Many SPIOs and ASPIOs still wait for the approval of their superiors or appellate authorities to finally pass on the information to petitioners, something which delays sharing of information and is completely avoidable.

The awareness about the various aspects of the Act among public and public authorities need to increase with strengthening of the RTI set up at various levels including provisioning of adequate resources and manpower. Given the massive expansion in the welfare state activities, RTI set up is in urgent need of having dedicated officers and staff members to attend to various queries and requests for information from members of the public.

FALLACY IN THE ACT

The act lacks necessary teeth for defaulters. In cases where information has been denied without sufficient cause, the penalty is not so harsh enough so as to have a deterrent effect on those who do not want to share information.

The act being based on computerized records of data, it may take a long time in computerization of such vast data and therefore the doubt hangs over whether the act would be implemented in a time bound manner.

AN ANTIDOTE TO CORRUPTION

India has the dubious tag of being the twentieth most corrupt nation in a recently compiled list of 91 countries around the world. This is consistent with most people's everyday experiences; corruption in India is rampant, from the common clerk to the highest offices of the country. Big Scams, for example, regarding defense deals, commonwealth games, 2G spectrum case, fodder procurement and sugar prices have frequently made the headlines. People even have to pay bribes to access basic information, such as their own electricity bills. And the right to information is thus a potent tool for countering corruption and for exposing corrupt officials. Due to this Act only, the blowing of Whistle blower provision and Lokpal Bill is being demanded and it will prove best to overcome all the evils of corrupt activities.

ELIXIR FOR THE MEDIA

The need for the media to be able to access information is of crucial importance in India, as it is elsewhere in the world. The media provides a link between the people and their government acts as a vehicle of mobilization. This role is particularly important in India, where the media played a major role in the freedom struggle as well as during the period of internal emergency, when civil and political rights were suspended. The media's right to information is not a special privilege but rather an aspect of the public's right to know, which the media play a key role in ensuring. This view finds support in statements of the Supreme Court of India in cases involving claims of press freedom.

As rightly pointed out by Ralph Nader, "Information is the Currency of democracy". We call this an age of information, which makes right to information inevitable. India presents a mixed picture with much secrecy legislation still in place restricting the free flow of information, but at the same time some significant developments at state level in terms of promoting freedom of information laws, as well as draft national legislation. Unfortunately, the draft law presently being considered by the Central Government is woefully inadequate. It is essential that decision makers fundamentally rework this draft, to ensure that legislation is passed which protects the public's right to know and promotes the free flow of information in India.

CONCLUSION

Despite of all shortcomings, legislation guaranteeing the right to information is a major step towards ensuring a participatory developmental process in the country. To make the law truly effective, the active participation of the community at large is needed, including non-governmental organizations and the press, who will need to simplify and disseminate the possibilities under the new law. The new law could be the tentative beginning of a more in cohesive development process what Dr. Amartya Sen describes as "a momentous engagement with the possibilities of freedom".

The right to information is a sine quo non of democratic polity. Information always empowers people and ensures transparency of administration. But people's access to information is very limited because of the fact that mechanism is not so effective and man's brain deliberately holds back information. This Act seems to be an effective legislation but what about its effective implementation, so government first needs to follow the policy of new law and educational tod to be stronger, so that the act may survive for a longer period and serve the deprived and poor people of this country. Also a high order Judicial Activism is also necessary regarding the implementation. If it succeeds in its purpose, it will necessarily increase public participation. If, through persistence and innovation, the RTI can be made to work effectively, then India will become a model of dozens of other countries in developing world.

Table 1: RTI Legislations A Comparison India VS Developed Nations

Country	Sweden	UK	US	India
Constitutional Protection	Protected	Not protected	Not protected	Protected (by interpreting)
Legislation	Freedom of the press Act 1776	FOI Act 2000	FOI Act, 1966	RTI 2005
Right of Access	Not limited by nationality or residence	Not limited by nationality or residence	Not limited by nationality or residence. But with exception	Limited only to citizens.
Procedural guarantees	Personal details of the applicant reasons for request	Personal details of the applicant + description of the information an desired	Personal details of the applicant + description of the information desired	Only contact details required
Duty to publish	No obligation to publish. In practice, information provided via websites	No information regarding publication	Certain information published in the federal register, while others available for inspection	Extensive rules on proactive or routine publication and regular updates
Exception	Unique exception relating preservation of animal/plant species	Contain rare or peculiar exceptions relating to the royal family	Contain rare or peculiar exceptions relating to information about oil wells	Do contain rare or peculiar exceptions information which would incite offence

Hence from these above comparison, we found India's RTI Act is generally claimed as one of the World's best law with an excellent implementation track record. It is one of the most empowering and most progressive legislations passed in the post-independent India.

**Table 2: Knowledge levels of RTI Act Across the Five States
(% of People who Responded YES to the Questions)**

Answering Base People who are Aware	All Total	Assam	Andhra Pradesh	Mahara-Shtra	Orissa	U.P.
	977	367	96	271	138	105
Right to ask for all information provided about any organization	59%	66%	23%	56%	64%	64%
Right to ask for information related to Govt. bodies	72%	87%	76%	48%	80%	60%
Right to ask for information about the private section	40%	50%	32%	30%	43%	35%
Right to ask for information related to media	42%	53%	26%	34%	41%	42%

Table 3: Presence of sig BBA, AMU Aligarh nage for Locating the Concerned PIO at a Public Authority

Presence of Signage in Concerned Govt. Department	Assam	Andhra Pradesh	Mahara-shtra	Orissa	U.P.	Assam
Answering Base	1,081	130	145	243	445	118
Proper signage was displayed	42%	6%	31%	40%	67%	50%
Very little signage displayed	11%	5%	12%	28%	4%	12%
No signage present	47%	89%	57%	33%	29%	83%

REFERENCES

- [1] Dhillon, R.S.(2010), DGP Probable latest Essays, Dhillion Group of Publication, New Delhi, pp394-397.
- [2] Gupta, R., (2009), A Book of 151 Supreme Essays, Ramesh Publishing House, New Delhi, pp.48-51 and612-615.
- [3] Gupta, S.C. (2008), A Book of 151 Essays, Arihant Publication, Meerut, pp.183-186.
- [4] Mohan, Saumitra. (2010, Oct.10). RTI: Some Reflections. Competition Wizard Magazine, pp.36-38.
- [5] rti.gov.in/rticorner/study by pwc/Keyissues.pdf. (Accessed on 23/01/2012)
- [6] www.cuts-international.org/CART/index.htm. (Accessed on 23/01/2012)

Mobile Agents and its Uses in E-commerce and Internet

Rashmi Priya

Research Scholar, TMU

Abstract— Mobile Agents are emerging as a promising paradigm for the design and implementation of e-commerce applications. Use of the Internet has exploded in recent years with the appearance of the World-Wide Web. In this paper, we show how current technological trends may lead to a system based substantially on mobile code, and in many cases, mobile agents. We discuss several technical and non-technical hurdles along the path to that eventuality. It seems likely that, within a few years, nearly all major Internet sites will be capable of hosting and willing to host some form of mobile code or mobile agents. In this paper we classify different mobile agents in e-commerce with their uses.

Keywords: Mobile Agent, Customization, Intranet, E-Commerce.

INTRODUCTION

Rapidly evolving network and computer technology, coupled with the exponential growth of the services and information available on the Internet, will soon bring us to the point where hundreds of millions of people will have fast, pervasive access to a phenomenal amount of information, through desktop machines at work, school and home, through televisions, phones, pagers, and car dashboards, from anywhere and everywhere. Mobile code, and in particular mobile agents, will be an essential tool for allowing such access.

Mobile agents are programs that can migrate from host to host in a network, at times and to places of their own choosing. The state of the running program is saved, transported to the new host, and restored, allowing the program to continue where it left off. Mobile-agent systems differ from process-migration systems in that the agents move when they choose, typically through a "jump" or "go" statement, whereas in a process-migration system the system decides when and where to move the running process (typically to balance CPU load). Mobile agents differ from "applets", which are programs downloaded as the result of a user action, then executed from beginning to end on one host.

Mobile agents are an effective choice for many applications, for several reasons, including improvements in latency and bandwidth of client-server applications and reducing vulnerability to network disconnection. Although not all applications will need mobile agents, many other applications will find mobile agents the most effective implementation technique for all or part of their tasks.

Although we believe that current trends in Internet technology and usage lead to the use of mobile agents, several technical and non-technical hurdles must be addressed along the way. These hurdles represent significant but not insurmountable challenges, so we predict that many major Internet sites will accept mobile agents within a few years. The goal of this paper is to spark discussion about how best to realize this optimistic, but reasonable, vision.

TRENDS

There are several trends affecting Internet technology and activity:

Bandwidth

The telecommunications industry is laying down astonishing amounts of fibre. Although Internet traffic is growing exponentially, the bandwidth soon to be available on the Internet backbone, as well as too many offices and neighborhoods, is immense.

Nonetheless, bandwidth too many end users will remain limited by several technical factors. Many users will still connect via modem, or at best, ADSL over the old copper loop. Many other users will connect via low-bandwidth wireless networks. Most users can expect to see no more than 128 Kbps to 1 Mbps available at their desktop or palmtop, although some asymmetric cable modems may reach 10 Mbps (for downloads).

Perhaps more importantly, the gap between the low-bandwidth "edge" of the network, and the high-bandwidth "backbone" of the network, will increase dramatically as the backbone benefits from increased quality and availability of fiber, while the edge remains limited by the fundamentals of wireless and copper connections. We expect that this trend will continue even as local connections improve past 1 Mbps in the next few years, since backbone bandwidths are improving much faster than local bandwidths. (For example, Nortel has announced a 1.6 Tbps optical-fiber product that will be out in the year 2000.)

Mobile Devices

One of the hottest areas of growth in the computer industry is portable computing devices. Everything from laptops to palmtops to electronic books, from cars to telephones to pagers, will access Internet services to accomplish user tasks, even if users have no idea that such access is taking place. Typically, these devices will have unreliable, low-bandwidth, high-latency telephone or wireless network connections.

Corporate Social Responsibility Creates Value for Shareholders

Satish Chander Jain

Associate Professor (Retd.), Dyal Singh College, Karnal (Haryana)

Abstract—Poor environmental performance tends to increase the volatility of firm's returns as firm incurs operational and compliance costs and also potential liabilities. If a firm earns profits continuously there is a possibility of increase in share prices, otherwise prices will come down. So environmental costs, cost of capital, and share prices are directly related to each other.

Strategic decision under corporate social responsibility within a company's related operations, capital assets, finance and management decide the revenue, operation costs, and the cost of capital which will ultimately have effect on value drivers and which will in turn affect the shareholders value. The Present paper focuses on the influence of decisions related to various areas of company on shareholders' value creation.

Keywords: 1.Value creation; 2.Environmental cost; 3.Cost of capital; 4.Share price; 5.Strategic decision

CORPORATE SOCIAL RESPONSIBILITY CREATES VALUE FOR SHAREHOLDERS

CSR is an evolving term that does not have a standard definition or a fully recognized set of specific criteria. The basic premise is the understanding that businesses play a key role in job and wealth creation in society. CSR has become relevant today as it helps corporation achieve a balance or integration of economic, environmental, and social imperatives, while at the same time addressing shareholder and stakeholder expectations. It is also known by a number of other names: corporate responsibility, corporate accountability, corporate ethics, corporate citizenship, sustainability, stewardship, triple bottom line and responsible business, to name just a few.

The World Business Council for Sustainable Development has described CSR as the business contribution to sustainable economic development. Building on a base of compliance with legislation and regulations, CSR typically includes "beyond law" commitments and activities pertaining to the business.

Corporate social Responsibility involves the efforts that business organisations undertake to meet their responsibilities both as economic and social agents. Business become aware of their social responsibilities through pressure exerted by their stakeholder customers, e.g. expect business to supply reliable and safe products at a fair price. Stockholders demand that their investment on corporate operations be managed efficiently and that their investments be rewarded with dividends and improved market value. Employees want their employees to honour commitments, provides a safe and rewarding work environment, and offer reasonable benefits. Similarly other stakeholder groups such as suppliers, community leaders and the media call for companies to offer benefit that contribute to the community, beyond just providing jobs and quality products.¹

Some strongly believe that the sole responsibility of business organisation is to earn a profit and that in doing so, it benefits the society in turn and meet people's material demands and needs as well. As against this traditional concept, the contemporary thinking is that organisations operate only because society allow them the right to do so and this right will continue only so long as society is satisfied with its results.²

The grantors of the right are the owners, creditors, suppliers, employees, customers, consumers and the general public at large.

BENEFITS OF CSR

Heightened Public Credibility

Companies that demonstrate a willingness to provide information that is credible, verifiable, and accessible can garner increased trust among stakeholders.

Increased Attractiveness to Investors

Investors—whether shareholders invested in socially responsible funds that screen companies for social and environmental attributes, or large institutions—welcome the increased disclosure that comes with corporate accountability.

Improved Relationships with Stakeholders

Companies that make an effort to be transparent and accountable for their actions and decisions are better able to build trust among their stakeholders. This engagement helps companies understand how community groups and other stakeholders perceive them, and educate them about future issues and concerns that may affect their operations. The information gained can help companies better define priorities and ensure business activities align with professed business principles or ethical codes. Many government agencies and stakeholders look favorably at companies that self-identify

Early Identification of Potential Liabilities

The strategic information that can come from efforts to develop a more accountable company—including social and environmental auditing and reporting and stakeholder dialogue—can identify practices or situations that could pose liabilities to a company.

Marketplace Advantages

Accountability can make entry and success in new markets easier by helping establish direct relationships with key customers and business partners. These relationships can contribute to innovation in product development or delivery, help mitigate potential negative media coverage, and enhance market presence. Some companies have used dialogue with stakeholders to help make decisions on overseas investments and operations, or to overcome the challenges of operating in markets with different cultures, laws, and languages.

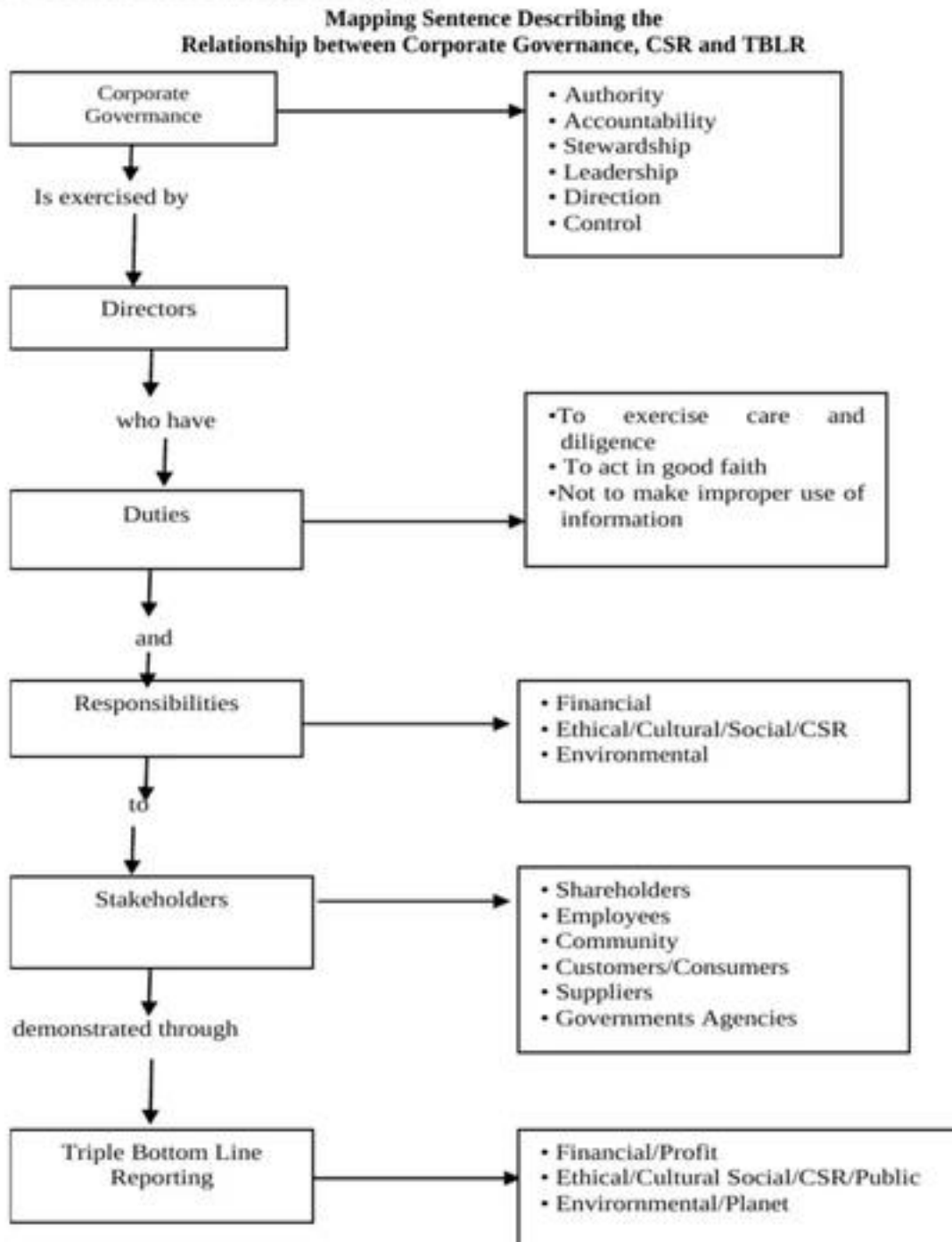


Fig. 1

Improved Overall Management

An analysis of Fortune 500 companies conducted at the Boston College Carroll School of Management found that companies judged as treating their stakeholders well are rated by peers as also having superior management. Many companies that have developed clear CSR performance and accountability systems inside their organisations report experiencing an improvement in their management practices overall. Increasingly, companies are finding that the impact of systems designed to increase accountability for CSR performance is not limited to the CSR realm, but can also impact performance in other areas as the culture of the organization undergoes change.

Improved Organisational Effectiveness

The process of self-assessment and evaluation that is part of increasing accountability can have beneficial impacts on company operations. For example, social and environmental auditing and reporting give companies the opportunity to assemble and assess more comprehensive information on operations and impacts. This information can help coordinate and maximize efficiencies and collaborations across departments, facilities, and business units. Through this process, companies compile examples of successful programmes from various parts of their organizations and share the learning throughout the company, leading to more effective and efficient policies and practices. Dialogues and partnerships with stakeholder groups can help companies build skills and competencies, or align company operations with mission and values.

Decreased Risk of Adverse Publicity

Accountable companies may be better prepared to address the concerns of customers or other stakeholders who might otherwise take negative action on social issues.

Growth in Public Expectations

One of the most significant developments in the field of corporate social responsibility (CSR) over the past few years has been the growth in public expectations that companies not only make commitments to CSR, but also develop systems to manage implementation, and systematically assess and report on progress relative to those commitments. Corporate accountability encompasses the system a company establishes to develop policies, indicators, targets, and processes to manage the full range of its activities. In order to promote CSR and citizenship in the new global market place **Mr. Kofi Annan** first proposed the global compact at Davos in January, 1999. It was thus created to help organizations redefine their strategies and course of actions so that all people can share the benefits of globalization not just a fortunate few.

The global compact's operational phase was launched at UN head quarters in New York on 26th July, 2000 and had since then focused its efforts on achieving practical results and fostering the engagement of business leaders in direction. The ten **principles of Global compact** in the areas of human rights, labour, environment and anti-corruption enjoy universal consensus.

- Principle 1:* Business should support and respect the protection of internationally proclaimed rights and
- Principle 2:* Make sure that they are not complicit in human rights abuses.
- Principle 3:* Business should uphold the freedom of association and the effective recognition of the right to collective bargaining.
- Principle 4:* The elimination of all forms of forced and compulsory labour.
- Principle 5:* The effective abolition of child labour and
- Principle 6:* The elimination of discrimination in respect of employment and occupation.
- Principle 7:* Business should support a precautionary approach to environmental challenge.
- Principle 8:* undertake initiatives to promote greater environmental responsibility and
- Principle 9:* Encourage the development and diffusion of environmentally friendly technologies.
- Principle 10:* Business should work against corruption in all its forms, including extortion and bribery.

Business Benefits of Corporate Social Responsibility

CSR expenses can benefit corporate houses in ways other than by increasing visibility. Some of the business benefits, which can be associated with CSR in the Indian context, are listed below. While some of them demonstrate a direct link with business benefits, some others can only be felt.

CSR Improve Financial Performance and Reduces Operating Costs

The desire and urge in business to be sensitive about social responsibility has a significant and far-reaching impact on financial performance, resulting in increased revenues and reduced costs. If a sense of CSR pervades through the

organization, it brings with it a sense of responsibility, which ultimately becomes a habit among the employees of the organization.

The adoption of a sensitive attitude towards the community forces business to strive for environmental improvements, for adopting eco-friendly measures using less energy and material, and for re-organising production processes, material flows and supplier relationships. It is an old saying that there is wealth in individual waste and it needs only appropriate eyes to identify that wealth. This concept when adopted as a matter of habit leads to the elimination of wastage at non-manufacturing sites through more judicious handling of waste, energy efficiency, water conservation, and so on. A project undertaken to separate waste in Tata Steel cost the company Rs. 100 Lakh in the first year, as it invested in 400 bins, but selling the waste earned it Rs. 20 crore.⁴

CSR Enhance Brand Image and Reputation

With increasing competition and little differentiation in product features, creating and sustaining a brand image is a challenge. Spending on visible CSR activities is a cost-effective means of achieving and sustaining a brand image. The Economic Times on 5-6 January 2007 conducted an online poll and found that 75% of the respondents opined the CSR activities increase the brand equity of a company. Good brand image leads to customer loyalty, which cannot be established overnight. Brand image binds the customers emotionally and CSR is a tool for activating that. On the consumers' part, there is a growing market for environment-friendly products. Products with eco-friendly labels are demonstrating their edge over unlabelled products.

CSR Increases Customer Loyalty and Sales

This is perhaps the most non-controversial statement about CSR's business benefits. Consumers not only want good and safe products, but would also like to know that what they buy was produced in a socially and environmentally friendly way, and are sometimes even willing to pay more for products that are produced in a socially and environmentally responsible manner. Loyalty is a combination of three elements: (i) products or service quality, (ii) price and, (iii) intellectual or emotional bonding. Consumers are usually loyal to products and change brands infrequently. However, a revolution is spreading across the business landscape. Across every industry, customers are increasingly becoming more demanding and less loyal. What worked yesterday cannot be presumed to work today, and what satisfies customers today may not satisfy them tomorrow. More and more customers are considering the environmental and social impacts of companies' activities when they make purchasing decisions. Brands like **Lijjat Papad** and **Amul** are Indian stories built on the concept of catering to the mass market and stated with the aim of fulfilling a social responsibility.

The accrual of business benefits of CSR in terms of increased sales and customer loyalty has given birth to a new concept called 'cause branding' or 'cause-related marketing.' Cause branding is intended to reinforce or improve a company's image by demonstrating the company's support for a particular issue, as for example, when a proportion of the sale is donated to an identified cause (say education). Cause branding can be achieved by associating and making partnerships with NGOs or can be undertaken on a self-sufficient basis with the chosen issue. A survey conducted in 2005 in UK reveals that buying a product or using a service that supports a charity or cause is one of the most preferred methods through which the public wants to support a charity.

CSR Increases the Ability to Attract and Retain Employees

The extent of publicity and goodwill generated by CSR activities helps in talent management as the employees feel pride in being associated with good corporate citizens. As human beings, in general, are God-fearing and want to remain associated with good people, companies with good CSR track records are better positioned to attract and retain employees.

CSR creates a dedicated workforce with high levels of self accomplishment people- who take pride in themselves and their company. It encourages a spirit of volunteerism amongst colleagues and boosts morale, builds self-worth, and fosters team spirit. CSR initiatives play a crucial role in attracting and retaining the best talents as youngsters consider the values of a corporate house and its social and environmental behaviour, before deciding to join or to continue working with it.

CSR Leads to Reduced Regulatory/ Activists Oversight

Businesses caring for their community responsibility get more co-operation and less queries from regulators, be it the administration or taxation officials or social and environment activists. The greater commitment a business house shows towards CSR the more lenient are governments and regulators with it. Such business houses get preferential treatment when applying for permits or licenses to undertake any project. Ministry of Labour, Government of Uttar Pradesh recently announced its decision to exempt businesses having SA 8000 certificate from several inspections till such time that the certificate is in force. Similarly taxation authorities tend to believe what the books of these companies show and what they represent and limit themselves to verification instead of carrying out a detailed investigation.

CSR Reduces Risk Thereby Facilitating Easier Finance or Access to Capital

Business that show an environmental and social responsibility tend to be viewed as being less risky than those that do not, as that can translate into cost prevention, lower insurance premium, reduced interest rates, reduced legal and regulatory

costs, greater investor appeals and so on. Time is not far when the depletion of natural resources like water and wood (particularly in India) will force the operations of some of the inefficient and non-caring organizations to come to a standstill. For example, our country already on the course to reach a situation of 'water scarcity' will force investors and lenders to differentiate between caring and non-caring organizations in the very near future, as far as the competitive capabilities to sustain costs are concerned.

Sound environmental management can lead to increased shareholders value. Value creation can be defined as "Value for shareholders which is created when a business, over time uses capital at its disposal to earn returns greater than or equal to the cost of that capital"

As per the traditional view, the environmental management is only a cost and penalty to investors with no benefit. There is also opposing opinion that environmental performance is having positive impact and also superior financial performance is possible. The following diagram explains the linkages between improved corporate environmental performance and the creation of shareholders value. Strategic decision within a company's related operations, capital assets, finance and management decide the revenue, operation costs, and the cost of capital which will ultimately have effect on value drivers and which will in turn affect the shareholders value.

The decisions related to various areas of company and their influence on shareholders' value creation is explained in detail.⁵

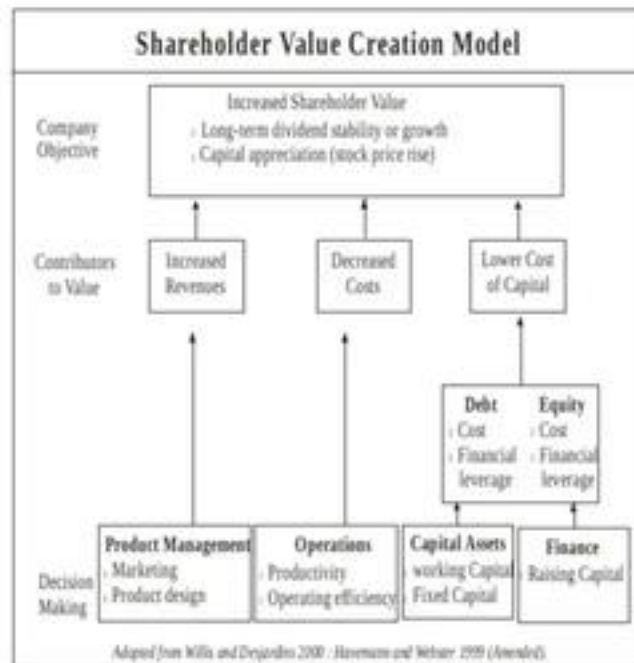


Fig. 2

Source: Environmental Management & Shareholder Value Creation by S Vijayalakshmi & Aparna Bellur I B Publication Page 111; 113

PRODUCT MANAGEMENT

Environmental focus should be attached at the time of designing the product itself which can result in new product development and sometimes redefine the markets also. This can be the result of market innovation as well; it can get the advantages of marketing, increased brand recognition and competitive advantage. This can be attributed to the liabilities side also when the product has adverse effect on the environment.

OPERATIONS

Environmental impact can be introduced during the process stage itself. These processes can help firms to reduce energy consumption, raw material inputs, as well as reduce waste, reduce costs and increases operational efficiency. Even insurance specialists opined that there will be reduction in risk for firms and in United States discounts are given in insurance premium to the extent of nearly 30 percent for environment impairment liability based on the degree of responsibility. Thus, eco-efficiency enhances value for the company, which ultimately enhances shareholders value.

CAPITAL ASSETS

Focus on environmental issues while making capital asset investment decisions, enables a company to lower the costs. An investment in environmentally appropriate fixed capital assets reduces production costs and enhances the operational efficiency. Even the lending companies also take into consideration these costs which will reduce the risk elements for favorable lending.

FINANCE

Financial decisions are crucial to any firm for value retention, value creation, expansion or acquisition. A firm's cost of capital changes, if risk level changes. A firm with low cost of capital can raise more finance than a company with high risk. So firms with poor environmental management should pay more interest rate than companies with good environmental management practices. In project financing also, lenders take into consideration the risk level of the firm.

Poor environmental performance tends to increase the volatility of firm's returns as firm incurs operational and compliance costs and also potential liabilities. If a firm earns profits continuously there is a possibility of increase in share prices, otherwise prices will come down. So environmental costs, cost of capital, and share prices are directly related to each other. Thus, corporate adopting a well defined CSR strategy tends to create value for its shareholders.

REFERENCES

- [1] Gupta Anand Dass. (Dr). and Gupta Aruna Dass -CSR : The India Context : Representation of Social Responsibility Vol. II Page 31. (1)
- [2] Pradhan B Bibhuti & Pattnaik Sanjib, Beyond Environmental Accounting: The T B L approach Environmental Accounting—An Introduction Page 141(3)
- [3] Robert Parket and Henery Eilbert "Social responsibility: the Underlying factors Business Horizons, Environmental Accounting—An Introduction, Aug. 1975 Page. 5" (2)
- [4] Aggarwal, Sanjay k Corporate Social Responsibility in India, page 36 (4)
- [5] S Vijayalakshmi and Aparna Bellur, Environmental management and shareholders value creation- Environmental Accounting—An Introduction, Page111;113 (5)

Accounting for Carbon Credits

Mukta Jain

Assistant Professor, Dyal Singh College, Karnal (Haryana)

Abstract—In recent years, business increasingly has been viewed as a major cause of social, environmental and economic problems. Companies are widely perceived to be prospering at the cost of the society and environment. To protect ourselves, our economy, and our planet from the adverse effects of environmental degradation, we must reduce emissions of carbon dioxide and other greenhouse gases. To achieve this goal the concept of Clean Development Mechanism (CDM) has come into vogue as a part of Kyoto Protocol under which Carbon Credit Certificates are issued to corporates that reduce their emission of GHG (greenhouse gases). Carbon credits are measured in units of Certified Emission Reductions (CERs). Business community in India has started seeing value in undertaking carbon accounting and reporting it in public forums. Carbon Accounting is the first step in measuring the contribution of Corporate in furthering sustainable development.

Keywords: 1.Greenhouse Gases; 2. Kyoto Protocol; 3. Clean Development Mechanism (CDM); 4. Carbon Credits; 5. Certified Emission Reductions (CERs) 6. Intangible Assets

INTRODUCTION

Day by day the climate on the earth is changing. Global warming has led to season shifting, changing landscapes, rising sea levels, increased risk of floods and droughts stronger storms, increase in heat related illness and diseases all over the world. This has resulted due to the emissions of carbon dioxide and other Greenhouse Gases (GHG's) from human activities including industrial processes, fossil fuel combustion, and changes in land use, such as deforestation etc. To protect ourselves, our economy, and our land from the adverse effects of climate change, we must reduce emissions of carbon dioxide and other greenhouse gases. To achieve this goal the concept of Clean Development Mechanism (CDM) has come into vogue as a part of Kyoto Protocol.

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with a greenhouse gas reduction commitment to invest in emission reducing projects in developing countries as an alternative to what is generally considered more costly emission reductions in their own countries. Under CDM, a developed country can take up a greenhouse gas reduction project activity in a developing country where the cost of GHG reduction project activities is usually much lower. The developed country would be given credits (Carbon Credits) for meeting its emission reduction targets, while the developing country would receive the capital and clean technology to implement the project. Carbon credits are certificates issued to countries that reduce their emission of GHG (greenhouse gases) which causes global warming. Carbon credits are measured in units of certified emission reductions (CERs). Each CER is equivalent to one tonne of carbon dioxide reduction.

There is a great opportunity awaiting India in carbon trading which is estimated to go up to \$100 billion by 2010. In the new regime, the country could emerge as one of the largest beneficiaries accounting for 25 per cent of the total world carbon trade, says a recent World Bank report. The countries like US, Germany, Japan and China are likely to be the biggest buyers of carbon credits which are beneficial for India to a great extent. The Indian market is extremely receptive to Clean Development Mechanism (CDM). Having cornered more than half of the global total in tradable certified emission reduction (CERs), India's dominance in carbon trading under the clean development mechanism (CDM) of the UN Convention on Climate Change (UNFCCC) is beginning to influence business dynamics in the country.

NEED FOR CARBON ACCOUNTING

Businesses are interested in getting started on carbon accounting. This is for two reasons –

1. First, carbon accounting and cutting carbon is directly tied to cost cutting. The more efficient a business house can be with energy, the more efficient it is with its money.
2. Secondly, there is a growing customer and consumer recognition about carbon accounting. So to maintain loyalty, businesses have to be able to answer questions about carbon footprint, and that means keeping track of it.

Having realized the crucial importance of good disclosure and corporate governance practices, investors across the globe are also demanding companies to disclose their climate change strategies, perceived risks and opportunities created by climate change, contribution to climate change and efforts taken to minimise corporate carbon footprints. Carbon accounting does assess the carbon footprints to help organisations adopt strategies aimed at fighting climate change.

Emission trading schemes such as the European Union Emission Trading Scheme (EUETS) have been introduced to create financial incentives for pursuing low carbon investment projects. Financial Accounting must facilitate the process by creating transparency about the cost of carbon so as to facilitate business and investment decisions in response to risks and opportunities of a low carbon transformation.

In India, a large no. of companies are generating carbon credits. Business community in India has started seeing value in undertaking carbon accounting and reporting it in public forums. Such forums include Carbon Disclosure Project (CDP) and company's Sustainable Development Reports. The number of companies which responded the CDP's information request on climate change strategy, risk and opportunities assessment and carbon accounting was 37 companies in 2007. The number increased to 51 in 2008 and dropped marginally to 44 in 2009, partially explained by the global financial crisis.

ACCOUNTING FOR CERS

Generally accepted carbon accounting principles are required to guide carbon accounting and reporting to ensure that the reported information represents a faithful, true and fair account of carbon emissions. Carbon credits being a relatively new area, ICAI realised the need to provide accounting guidance in this area and accordingly issued a Guidance Note on Accounting for Self generated Certified Emission Reductions (CERs).

The present paper discusses the accounting principles relating to recognition, measurement and disclosures of CERs generated by the entity that has obtained the same under the clean development mechanism as has been suggested by ICAI.

IS CER AN ASSET?

"An asset is a resource controlled by the enterprise as a result of past events from which future economic benefits are expected to flow to the enterprise."

CER is a resource controlled by the generating entity and leads to expected future benefits on the future sale of CERs. Thus, CER is an asset for the generating unit.

At What Stage Carbon Credits May Be Recognised As an Asset?

To generate Carbon Credits various stages are involved in a CDM project activity. The question is at what stage the Carbon Credit may be recognised as an asset. Should it be at the time when emission reductions are taking place or should it be at the time when DOE (Designated Operational Entity) submits the verification report and other relevant documents to the Executive Board requesting for issuance of CERs or should it be at the time when UNFCCC certifies and issues the CERs to the entity.

Now, as far as the stages of emission reduction and verification by DOE are concerned CERs can best be regarded as Contingent asset as per AS 26 "Provisions, Contingent liabilities and Contingent Assets" which defines the contingent asset as "A possible asset that arises from past events the existence of which will be confirmed only by the occurrence or non- occurrence of one or more future events not wholly within the control of the enterprise. This is because the generating unit reducing carbon emissions by way of a CDM project becomes eligible to receive CERs from UNFCCC but the actual accrual and receipt of CERs by the generating units depends on the certification of the same by UNFCCC which is a future uncertain event. Thus, CER becomes an asset only when the communication of credit of CERs is received by the generating unit.

RECOGNITION OF CERS

As per paragraph 88 of the "Framework for the Preparation and Presentation of the Financial Statement"

"An asset is recognised in balance sheet when it is probable that the future economic benefits associated with it will flow to the enterprise and the asset has a cost or value that can be measured reliably"

Thus, for CERs to be recognised as an asset in the financial statements of the generating entity, the two criteria to be met are as follows:

1. The first criterion is probable future economic benefits flowing from the CERs. The market for CERs is relatively new as such the future economic benefits may not always be assured. But it is also true that there is a probable market consisting of entities of Annex I countries bound by the KYOTO PROTOCOL emission reduction targets which will buy the CERs generated by the entities in the developing countries.
2. The second criterion is the criterion for measurement of cost and value. There are certain costs which are incurred to generate CERs and therefore the cost of CERs can be measured reliably.

Thus, CERs meets both the criteria for recognition in the financial statements. Accordingly, CERs may be recognised in the financial statements of the generating unit.

WHAT TYPE OF ASSET IS CER?

Having established the fact that CER is an asset, the next question is what type of an asset? Is it a tangible asset or an intangible asset?

It is but natural that CERs cannot be classified as tangible assets because of their non physical form. It means CERs may be categorised as an intangible asset. AS-26 defines intangible asset as “an identifiable non monetary asset, without physical substance, held for use in the production or supply of goods or services, for rental to others or for administrative purposes”. According to this definition, CERs do not strictly fall within the meaning of intangible asset because they are not held for use in the production or supply of goods or services or for rental to others or for administrative purposes, but are held for the purpose of sale. However, within the provisions of AS-26, it has been indicated that intangible assets include assets developed and held by an entity for sale. Thus, CERs may be classified as intangible assets, though not fixed but current intangible asset because they are not held for use in production or supply but for sale to others. Thus it can be said that CERs are intangible inventories of the business and may be accounted for as per AS-2 “Valuation of inventories” and not as per AS-26.

MEASUREMENT OF CERS

Measurement of CERS should be in accordance with the principles laid down in AS-2 for valuation of inventories.

As per AS-2, the inventories should be valued at cost or net realisable value whichever is lower. Thus, CERs should also be measured at cost or net realisable value whichever is less.

COST OF CERS

The cost of inventories includes all cost of purchase, cost of conversion and other costs incurred to bring the inventories to their present location and condition.

For generating CERs, various costs incurred by the generating unit include the research cost for exploring ways to reduce carbon emission, cost for preparing Project Design Documents, fees paid to the various authorities such as DOEs, National Authority and UNFCCC, operating costs to run the CDM project, etc. However, all these costs cannot be considered as the costs of bringing the CERs to existence and therefore cannot be categorised as inventories. For example, the research and development costs are the pre-implementation costs of the CDM projects which do not result in CERs. Accordingly, these should be treated Intangible Assets as per Accounting Standard (AS) 2 when they bring into existence a separate intangible asset such as a patent of a process to reduce carbon emissions. Similarly an entity may use certain special plant and equipments for the purpose of reducing carbon emissions. In respect of such equipments/devices, the provisions of the Accounting Standard (AS) 10, (Revised) Property, Plant Equipment and will apply. Thus it is only the costs incurred for certification of CERs which may be taken as the cost of CERs inventories. The certification costs include the two types of levies imposed by UNFCCC and the fees paid to the consultant for rendering services to obtain the certificate. One of the levies is paid in cash while the other one is in kind under which a specified percentage of the CERs earned are deducted at the time of issuance by the UNFCCC. CERs are issued net of this levy. For example, if 1,000 CERs have been generated by the generated by the generating unit and the levy is 1%, then the certificate will be issued only for 990 CERs after deducting 10 CERs at the rate of 1% from the total 1,000 CERs generated. This levy may be treated as a normal loss which increases the per unit cost of the CERs generated. The levy paid in cash and the consultant’s fees should be included in valuation of CERs at cost.

NET REALISABLE VALUE OF CERS

Estimated selling price less the estimated selling expenses is generally taken as the net realisable value. Assuming no selling expenses, the net realisable value of CERS may be taken as the price at which they can be sold to Annex I countries.

MEASUREMENT OF UNDERLYING ASSETS RELATED TO CERS

For the generation of CERs, the generating unit may create certain tangible and intangible assets. In so far as the intangible assets are concerned, provisions of AS-26 shall be applied whereas in case of tangible assets AS-10 shall be applicable.

CARBON CREDITS AND TAXATION

It is clear from the above explanation that carbon credits are intangible inventories that can be sold in the carbon market. The sale of carbon credits naturally results in income generation for the corporate. For projects in India, the expected number of CERs is around 60 million per annum and at the prevailing rate of \$10 per CER, the total value is estimated to be \$600 million per annum. Realising the fact that CER market is likely to increase to at least four times the present level, certain taxation issues have also emerged.

Some may be of the view that the income from the sale of carbon credits should be taxed as normal business income. However, in my opinion, imposing tax on carbon credit income may adversely affect the investment in CDM projects. As such, no tax should be levied on income from sale of carbon credits. The Indian Income Tax Act 1961 has been providing tax-exemptions to certain incomes such as agricultural income, income of charitable and religious institutions, export income from newly established units in special economic zones, income of research association and many more such

incomes on the grounds of national economic interests. In the same way, tax exemption should be extended to income from carbon credits because it is not only in national economic interest but also for global environmental protection in the interest of the society at large.

However, a tax may be imposed on those industrial units which emit more carbon than the standard levels. This will discourage the industrial from using inferior technology endangering the beauty of the motherland and the survival of the planet as a whole.

CONCLUSION

Global warming is a serious matter and emission levels need to be reduced. An innovative method in the name of carbon trading has emerged having great potential and opportunities for the investors all over the world. As per CRISIL research report issued in May, 2010 carbon credits generated out from emission reduction projects undertaken in India will triple over next three years and the numbers are expected to increase from 72 millions in November, 2009 to 246 millions by December, 2012.

There is still long way to go for Indian businesses on the path of carbon accounting and disclosures. Even in the top 200 firms in India (by market capitalization), the response rate in last few years has steadily increased and reached 20%, a rather dismal performance compared to developed markets.

There are a few sectors like the software and services which are clear leaders in being carbon-aware, accounting carbon emissions from their emissions, taking efforts in reducing it and communicating it to the stakeholders. Part of this can be explained given the fact that these companies are most export dependent and draw majority of their clientele and revenues from markets of US and EU. Clear laggards in efforts in this direction are companies in the field of banking & diversified financials, capital goods, real estate and retail. Very few companies in these sectors have responded to the CDP information request and have accounted for their carbon emissions.

REFERENCES

- [1] CA Sanjay K. Agrawal "Accounting and Taxation aspects of Carbon Trading", *The Chartered Accountant*, October 2006, Page 509.
- [2] Nidhi Bodhra, "Carbon Credits- Unravelling regulatory, Taxation and Accounting Aspects."
- [3] ICAI Exposure Draft on "Guidance Note on Accounting for self-generated carbon credits."

Mobile Users

Web-based email services¹ make it clear that users value the ability to access their email from any computer. Web terminals will become commonplace in public spaces, such as cafes, airports, and hotels. Eventually, particularly with the growth in bandwidth, users will have full access to all of their files and applications from any terminal. Despite this, mobile devices will proliferate unchecked, since just as with public phones, Web terminals will never be available everywhere that a user might find herself.

Intranets

Organizations are increasingly using Internet protocols, particularly HTTP, to build internal "intranets" for their own distributed-information needs. All access to an intranet is managed by a single organization. Thus, new technologies can be deployed quickly, since (1) little coordination is needed with outside organizations, and (2) security (within the intranet) is of less concern.

Information Overload

Internet users are already overwhelmed by the sheer volume of available information, and the problem will get worse as the Internet grows. Search engines, shopbots, portals, collaborative filtering, and email filtering are existing technologies that allow the user to reduce the torrent to a manageable stream, but these technologies are still quite limited.

Customization

Unlike broadcast media, the Internet makes it possible to customize access for each user. Current technologies allow customization at both the client (browser) and the server. Many Web sites include their own site-specific customization features, but the customization is increasingly provided by third-party "proxy" sites.

Proxies

Such proxy sites, which today are most often Web sites such as the various shopbots, interpose between a user and one or more other Internet services. As a means to both reduce information overload and customize service access, proxy sites will become more and more important. In particular, as portable devices become more prevalent, highly specialized proxy sites will be provided to meet the special needs of mobile users.

Uses of Mobile Agents

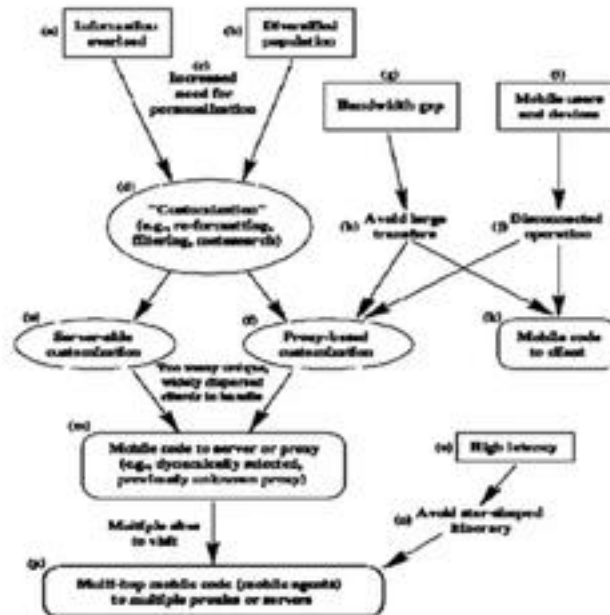


Fig. 1: The Trends Leading to Mobile Agents

The trends outlined in the previous section lead to the conclusion that mobile code, and mobile agents, will be a critical near-term part of the Internet. Why? Not because mobile code makes new applications possible, nor because it leads to dramatically better performance than (combinations of) traditional techniques, but rather because it provides a single, general framework in which distributed, information-oriented applications can be implemented efficiently and easily, with the programming burden spread evenly across information, middleware, and client providers. In other words, mobile code gives providers the time and flexibility to provide their users with more useful applications, each with more useful features. Our full argument roughly follows Figure 1.

Insider Trading

Amit Kumar Goel¹ and Fawad Ali Khan²

¹Asst. Professor, Integral University, Aligarh

²Sr. Lecturer, Integral University, Aligarh

Abstract— An analysis of the effects of trading by individuals with private information is presented. Such trade generally adds to the liquidity and the efficiency of stock markets. However, some types of "insider" trading decrease the liquidity and the viability of stock markets. It is extremely difficult to isolate liquidity-enhancing trades from those that decrease liquidity. However, it is in the exchanges' interest to do so, and most stock exchanges have rules against some forms of insider trading. The analysis suggests that a careful cost-benefit analysis precede any government-imposed restrictions on insider trading in stock markets.

Keywords: Insider Trading; SEBI

DEFINITION OF 'INSIDER TRADING'

The buying or selling of a security by someone who has access to material, non public information about the security.

An Insider

A company insider is someone who has access to the important information about a company that affects its stock price or might influence investors decisions. This is called material information.

The company executives obviously have material information. The Vice President of Sales, for example, knows how much the company has sold and whether it will meet the estimates it has provided to investors. Others within the company also have material information. The accountant who prepares the sales forecast spreadsheet and the administrative assistant who types up the press release also are insiders.

Not an Insider

So does that mean you are not an insider unless you are on the company's management team, financial or development teams, or someone hired to handle the material information? In a word, "No".

The US Security and Exchange System (SEC) include in its definition of insiders those who have "temporary" or "constructive" access to the material information. If the President of a company tells you that the company's best hope for a breakthrough product isn't going to get regulatory approval, you are now every bit as much an insider as he is, with respect to that information. It is illegal for him to trade based on that knowledge before it becomes public knowledge. It is equally illegal for you to do so because you are now a "temporary insider". This remains true regardless of how many times the information is passed. If the president tells his barber, who tells her baby sitter, who tells her doctor, who tells you, the barber, baby sitter, doctor and you are all "temporary insiders".

Anyone who has material information is prohibited from trading, based on that knowledge, until the information is available to the general public. The US Supreme Court ruled recently, that this even applies to someone with no ties to the company. Possession of material information makes you an insider, even if you stole the information.

Meaning of Insider & Insider Trading

Securities and Exchange Board of India (Prohibition of Insider Trading) Regulations, 1992, does not directly define the term "insider trading".

But it defines the terms:

- Insider" or who is an "insider;
- Who is a "connected person
- What are "price sensitive information"

Insider

According to the Regulations "insider" means any person who, is or was connected with the company or is deemed to have been connected with the company, and who is reasonably expected to have access, connection, to unpublished price sensitive information in respect of securities of a company, or who has received or has had access to such unpublished price sensitive information;

The above definition in turn introduces a new term "connected person".

Connected Person

The Regulation defines that a "connected person" means any person who-

1. Is a director, as defined in clause (13) of section 2 of the Companies Act, 1956 (1 of 1956) of a company, or is deemed to be a director of that company by virtue of sub-clause (10) of section 307 of that Act or
2. Occupies the position as an officer or an employee of the company or holds a position involving a professional or business relationship between himself and the company whether temporary or permanent and who may reasonably be expected to have an access to unpublished price sensitive information in relation to that company;

Price Sensitive Information means any information, which relates directly or indirectly to a company and which if published, is likely to materially affect the price of securities of company.

The term insider trading is popularly used in the negative sense as it is perceived that the persons having access to the price sensitive and unpublished information used the same for their personal gains. However insider trading per se does not mean any illegal conduct. It encompasses both legal as well as illegal conduct.

LEGAL AND ILLEGAL INSIDER TRADING

Insider trading can be legal or illegal depending on when the insider makes the trade: it is illegal when the material information is still non public. Trading, while having special knowledge is unfair to other investors who don't have access to such knowledge. Illegal insider trading therefore includes tipping others when you have any sort of non public information. Insider trading is legal once the material information has been made public, at which time the insider has no direct advantage over other investors. Insider trading takes place legally every day, when corporate insiders – officers, directors or employees—buy or sell stock in their own companies within the confines of company policy and the regulations governing this trading.

INSIDER TRADING IN INDIA

SEBI as the watchdog of all the stock exchanges in India, has been obligated to protect the interest of the investors in the securities market and to regulate the stock market through such other regulations as it deems fit. The SEBI acts as the regulator in the share market by taking all precautionary measures in order to repose the confidence of the investors who are investing in the market. It is due to the very fact that the investors invest on the shares being speculative, but when the prices of the shares could be predicted well before in hand then they may take a decision accordingly. Hence, pre determined price may result in undesired consequences as people may buy huge amount of shares whose value may appreciate.

The SEBI has dealt with a wide ranging plethora of cases on insider trading concerning the following aspects. The secret agreement often involves individuals who have a relationship. It may be family relationship or a business relationship. Some of them are mentioned below.

- Corporate officers, directors, and employees who traded the corporations securities after learning of significant, confidential corporate developments;
- Friends, business associates, family members, and other tippees of such officers, directors, and employees, who traded the securities after receiving such information;
- Employees of law, banking, brokerage and printing firms who were given such information to provide services to the corporation whose securities they traded;
- Government employees who learned of such information because of their employment by the government; and

In India Regulation 3 of the SEBI Regulations seeks to prohibit dealing, communication and counseling on matters relating to, insider trading. Regulation 3 provides that no insider shall either on his own behalf of any other person deal in securities of a company when in possession of any unpublished price sensitive information on communicate, counsel or procure, directly or indirectly any unpublished price sensitive information to any person, who while in possession of such unpublished price sensitive information shall not deal in securities. However, these restrictions are not applicable to any communication required ordinary, course of business or profession or employment or any law.

Further 3 A prohibits any company from dealing in the securities of another company or associate of that other company while in possession of any unpublished price sensitive information.

Insider Trading Regulations have been tightened by SEBI during February 2002. New rules cover 'temporary insiders' like lawyers, accountants, investment bankers etc.

NEED FOR PREVENTING INSIDER TRADING

The ideal securities market is concerned with the allocation of capital in the economy. This function is enabled by market efficiency, the situation where the market price of each security accurately reflects the risk and return in its future. The primary function of regulation and policy is to foster market efficiency, hence we must evaluate the impact of insider

trading upon market efficiency. Insider trading appears to be biased especially to the speculators who invest in the market expecting there would be an appreciation in the value of the shares. The individual and institutional speculators are badly hit due to insider trading. Indeed, inside traders competing with professional traders is not unlike foreign goods competing on the domestic market – the economy at large benefits even though one class of economic agents suffers.

CODE OF BUSINESS PRINCIPLES

The Code of Business Principles is the Company's statement of values and represents the standard of conduct which all the employees are expected to meet in their business endeavours. This code of business is also reflective of the ethical and moral standards which are expected from the employee in discharging their duty. The commitment of the company to foster a healthy climate of transparency, and fairness is reflected in this code of conduct.⁴

SHARE DEALING CODE

In furtherance of the SEBI (Prohibition of Insider Trading) Regulations, 1992, the Company has established systems and procedures to prohibit insider trading. The Share Dealing Code of the Company is an important governance code to prevent any insider trading activity by dealing in shares of the Company. The Code restricts the Directors of the Company and other specified employees to deal in the securities of the Company on the basis of any unpublished price sensitive information available to them by virtue of their position in the Company.

The objective of this Code is to protect the interest of shareholders at large, to prevent misuse of any price sensitive information and to prevent any insider trading activity by dealing in shares of the Company by its Directors and employees. A copy of the Share Dealing Code of the Company is made available to all the employees of the Company and the compliance of the same is ensured.

The SEBI (prohibition of insider trading) Regulations, 1992 is a regulatory mechanism is put in place to oversee the fact that there is no leakage of such information. According to the regulations two things should be established in order to establish the fact that there is a disclosure of the price sensitive information. First and foremost the fact that there is a divulgence of the price sensitive information concerning the issuer company and secondly the person who dealt had the information in a position of trust or was tipped about so much information by a person in fiduciary capacity or in any position of trust.

At the outset it is pertinent to define the person who may be treated as an insider within the scope and ambit of the regulation of the SEBI. Section 2 (e) of the SEBI (Prohibition of Insider Trading) Regulations, 1992 defines insider in the following words. Insider means any person who, is or was connected with the company or is deemed to have been connected with the company, and who is reasonably expected to have access to unpublished price sensitive information in respect of securities of company, or who has received or has had access to such unpublished price sensitive information.⁵

REGULATORY MECHANISM IN INDIA: HISTORICAL BACKDROP

Insider trading continued unabated until 1970 which in sum and substance would imply that it was practiced for 125 years in a country like India. The security market in India developed through the establishment of the Bombay Stock Exchange was way back in 1875. It was realized that such a system is detrimental to the interest of the Indian stock exchange. In 1979, the Sachar committee said in its report that company employees like directors, auditors, company secretaries etc. may have some price sensitive information that could be used to manipulate stock prices which may cause financial misfortunes to the investing public. In 1989 the Abid Hussain Committee also recommended that the insider trading activities may be penalized by civil and criminal proceedings and also suggested that the SEBI formulate the regulations and governing codes to prevent unfair dealings.

Complying with the recommendations by these committees, India through Securities and Exchange Board of India (Insider Trading) Regulations 1992 prohibited this mal practice. A person convicted of this offence is punishable under Section 24 and Section 15G of the SEBI Act 1992. These regulations were drastically amended in 2002 and renamed as SEBI (Prohibition of Insider Trading) Regulations 1992. These acts are stringent to quit an extent as they impose sanctions and punish the offender. All the listed companies and market intermediaries have to comply with the directions of these regulations. The merchant bankers and the professional firms also comply with it.

United States Perspective on Insider Trading

The United States Sanction Act, 1984 imposes fines up to three times the profit gained or loss avoided by use of such material non-public information. It is not out of place to mention here that Section 16 of the Exchange Act, requires all officers and directors of a company and beneficial owners of more than 10 per cent of its registered equity securities to mandatorily file an initial report with the commission as well as with the exchanges on which the stock may be listed. They should disclose their holdings of each of the company's equity securities. The United States law is much more stringent in comparison to the Indian regulations which are often being castigated as paper tiger for its lack of efficacy in curbing such insider trading. It is pertinent to mention here that the United States law provides that the profits obtained from the purchases and sales from such securities within any six month period may be recovered by the company or by any security holder on its behalf.

In *United States v. Carpenter* the U.S. Supreme Court cited an earlier ruling while unanimously upholding mail and wire fraud convictions for a defendant who received his information from a journalist rather than from the company itself. The journalist was also convicted, on the grounds that he had misappropriated information belonging to his employer. The employer in this case happened to be the *Wall Street Journal*. In that widely publicized case, Winans traded in advance of "Heard on the Street" columns appearing in the *Journal*.

The court ruled in *Carpenter*: "It is well established, as a general proposition, that a person who acquires special knowledge or information by virtue of a confidential or fiduciary relationship with another is not free to exploit that knowledge or information for his own personal benefit but must account to his principle for any profits derived therefrom."

INDIAN CASE LAWS

The facts of the Case of the **Rakesh Aggarwal Vs SEBI** are explained in brief. Rakesh Aggarwal, the Managing Director of ABS Industries Ltd. (ABS), was involved in negotiations with Bayer A.G (a company registered in Germany), regarding their intentions to takeover ABS. Being the Managing Director with such high portfolio it goes without saying that he has access to the price sensitive information. Rakesh Aggarwal in order to escape from the vigilant eyes of SEBI played a trick. He wanted to circumvent the provisions of law through tactful manner. Before the announcement of the merger is made public through announcement, he made a collusive agreement with his brother to take over the shares of ABS from the market. Thereafter he tendered the same shares through the open offer making a huge profit. These clandestine agreements could be traced by SEBI through their thread bare investigation. Bayer AG subsequently acquired ABS. Further he was also an insider as far as ABS is concerned.

The secretive agreement entered between Rakesh Aggarwal and brother in law to acquire the shares before the merger is carried out is a violation of section 3 and 4 of the Securities Exchange Board of India prohibition of Insider Trading Regulations, 1992. Rakesh Aggarwal vehemently denied the allegations leveled against him by the SEBI stating that he has acted in such a manner for the benefits of the company and he has no intention to have personal gains. He said that he wanted to acquire 51 percent shares of the company of ABS through Bayer and he wanted to plan to be executed in clinical precision. The SEBI directed Rakesh Aggarwal to deposit Rs. 34, 00,000 with Investor Education & Protection Funds of Stock Exchange, Mumbai and NSE (in equal proportion i.e. Rs. 17, 00,000 in each exchange) to compensate any investor which may make any claim subsequently.

- A case against Rakesh Aggarwal is made out under section 24 of the SEBI Act.
- Adjudication proceedings under section 15I read with section 15 G of the SEBI Act against Rakesh Aggarwal.

Rakesh Aggarwal made an appeal to Securities Appellate Tribunal, Mumbai. The Tribunal held that the part of the order of the SEBI directing Rakesh Aggarwal to pay Rs. 34, 00,000 couldn't be sustained, on the grounds that Rakesh Aggarwal did that in the interests of the company (ABS), as is mentioned in the facts above.

CONCLUSION

The Securities Exchange Board of a country has a central objective i.e., protecting the interests of the investors and regulating the business in stock markets and other securities markets. The Indian Exchange Commission, i.e., SEBI seeks to look after and secure the same. The Primary function of SEBI is to ensure that the interest of the innocent investors' are protected since they repose complete faith and trust on SEBI as an able and efficient regulator. The prevention of an insider trading is a is just an extension of its primary function of safeguarding the interest of the investors'. The principle of business standards and ethics demands that some discipline and decorum should be followed in the administration of the company as well as the stock market. From the point of view of the internal administration of the company, it is really an uphill task to keep an eagle eye on the use of sensitive information for personal gains since the people at the helm of the affairs such as directors who owe a fiduciary duty to keep the company in proper shape are the one who give preference to their vested interest over the interest of the company.

In the modern era of LPG, there is heavy inflow of FDI where we find that there is participation from foreign companies and all. The disclosure of price sensitive information before the publication really casts aspersion on the role of the SEBI as an efficient regulator. India has to strengthen its enforcement of recently amended insider trading act, so as to prove to both the domestic and foreign investor that they are investing in fair and transparent securities market, where strict compliance of the prohibition is ensured by the enforcement agencies.

Finally, preventing insider trading is not about a set of rules or filling alleged loopholes. It is about a determination to go after illicit trades and the power to punish offenders. Until SEBI shows it is serious about checking insider trading, the activity will continue to thrive unchecked. For that the regulatory authority has to ensure that the SEBI Regulations on Insider trading is a separate code by itself. Preferably, it must be made into a separate Act as a part of general law relating to frauds, as is the case in the US. This will ensure that SEBI does not have to draw concepts and principles from the UK and US laws to strengthen its case. At the same time it must also avoid the impression that there is ambiguity or weakness in the Indian Insider Trading Regulations.

REFERENCES

- [1] An overview of the Insider Trading Regulations in India available at <http://airwebworld.com/articles/index.php?article=1264>.
- [2] Sudershani Ray and Kartik Dawar, 'Insider Trading and its Legal mechanism'. Available at <http://www.legalserviceindia.com/article/1147-Insider-Trading-And-its-Legal-Mechanism.html>.
- [3] <http://www.investopedia.com/terms/i/insidertrading.asp>.
- [4] Shah, "Why Forbid Insider Trading? Available at www.ccsindia.org/policy/money/studies/wp0029.pdf.
- [5] Samir C. Arora v SEBI (2002) 38 SCL 422.
- [6] Rakesh Agrawal v SEBI Appeal No 33 of 2001.
- [7] SEC v. Texas Gulf Sulphur Co. 1968, CA2 NY.
- [8] Dirks Vs SEC 483 U.S. 350.

Succession Planning: Identifying and Nurturing Future Leaders

Orooj Siddiqui, Fawad Ali Khan and Abdul Tayyab Khan

Sr. Lecturer, Integral University, Lucknow

Abstract—This paper has been written with the following objectives: Identification of leadership styles to develop an effective succession plan & developing a model to gauge leadership ability based on the eight major leadership theories. The Methodology that has been adopted to carry out this study is mentioned below: Secondary Source: Data available through previous research works that have been done through different agencies has also been used to formulate a conclusion. The main conclusions that have been arrived at after conducting the study are as follows: Efficient leadership is the main driving force for effective succession planning & leadership is merely a state of mind certified by a multitude who identifies with the same string of thoughts.

Keywords: Succession Planning, Hierarchical Leaders v/s Emerging Wannabies

INTRODUCTION

Succession Planning

It is a process for identifying and developing people with the potential to fill key leadership positions. Succession planning increases the availability of experienced and capable leaders that are prepared to assume these roles as they become available. Actively pursuing succession planning ensures that leaders are constantly developed to fill each needed role. Research indicates that clear objectives are critical to establishing effective succession planning.

- Identify those with the potential to assume greater responsibility.
- Provide critical development experiences to those that can move into key roles.
- Engage the leadership in supporting the development of high-potential leaders.

LEADERSHIP THEORIES - 8 MAJOR LEADERSHIP THEORIES

"Great Man" Theories

Great man theories assume that the capacity for leadership is inherent – that great leaders are born, not made. These theories often portray great leaders as heroic, mythic and destined to rise to leadership when needed

Trait Theories

Similar in some ways to "Great Man" theories, trait theories assume that people inherit certain qualities and traits that make them better suited to leadership. Trait theories often identify particular personality or behavioral characteristics shared by leaders

Contingency Theories

Contingency theories of leadership focus on particular variables related to the environment that might determine which particular style of leadership is best suited for the situation. According to this theory, no leadership style is best in all situations

Situational Theories

Situational theories propose that leaders choose the best course of action based upon situational variables. Different styles of leadership may be more appropriate for certain types of decision-making.

Behavioral Theories

Behavioral theories of leadership are based upon the belief that great leaders are made, not born. Rooted in behaviorism, this leadership theory focuses on the actions of leaders not on mental qualities or internal states. According to this theory, people can learn to become leaders through teaching and observation

Participative Theories

Participative leadership theories suggest that the ideal leadership style is one that takes the input of others into account. These leaders encourage participation and contributions from group members and help group members feel more relevant and committed to the decision-making process. In participative theories, however, the leader retains the right to allow the input of others.

Management Theories

Management theories, also known as transactional theories, focus on the role of supervision, organization and group performance. These theories base leadership on a system of rewards and punishments. Managerial theories are often used in business; when employees are successful, they are rewarded; when they fail, they are reprimanded or punished.

Relationship Theories

Relationship theories, also known as transformational theories, focus upon the connections formed between leaders and followers. Transformational leaders motivate and inspire people by helping group members see the importance and higher good of the task. These leaders are focused on the performance of group members, but also want each person to fulfill his or her potential. Leaders with this style often have high ethical and moral standards.

In the last 60 years there has been a revolution in Leadership from 'Command & Control' to 'Business Leadership'. A great deal of money being invested in this by both government and NGOs. The change in the understanding of leadership is as significant as the fall of communism. Change is at the root of it.

John Adair, of University of Surrey & Sandhurst, described three levels of leadership (Figure 1)

- Team leadership (control of a single team)
- Operational leadership (control of a number of teams which make up a complete operation)
- Strategic Leadership (control of the entire business/ organisation)

Leadership is required at all levels of an organisation, and teamwork is required to bind the teams together.

A leader needs to:

- Define the task
- Plan
- Brief / communicate
- Control
- Evaluate
- Motivate
- Organise
- Set an example

As a leader moves up this pyramid, they need to also:

- Set a direction
- Align peoples' efforts
- Bring out the best in people
- Act as a change agent
- Handle uncertainty & crises

An interesting question to ponder is "Why is it that one person is accepted as a leader in a group (and not someone else)?"

"You can be appointed as a manager, but you aren't a leader till people choose to follow you"

John Adair

A Leader needs the following qualities:

- He/she must personify the key qualities required in your field (technically competent)
- Enthusiasm
- Integrity (required to generate trust)
- Toughness, fairness and being demanding
- Warmth, humanity and tact
- Humility (arrogance means you don't learn)

These days most people recognise that there are two distinctly different types of leadership:- (Figure 2)

Positional

That comes from your position in the organisation, and

Situational

That emerges from what is happening on the ground (think of the person soldiers actually follow under fire)

Knowledge

That derives from being technically knowledgeable & competent ('knowledge is power')

A leader, to be effective, needs to derive his/her authority from all three sources.

Xenophon, an Athenian general and student of Socrates, asked "Why do sailors, who are undisciplined when ashore, obey the captain on board in a storm? Because he knows..."

In the 1960s, working on behalf of the US military tried to analyse & understand Leadership. They observed two types of behaviour:

- Actions to achieve the task
- Actions to look after the 'people' issues.

Meanwhile in the UK, John Adair, then teaching at the Royal Military Academy, Sandhurst carried out some observation work on young officer cadets handling leadership tasks. He noticed that the effective leaders met three sets of needs:- (Figure 3)

- The needs of the task
- The needs of the team undertaking the task
- The needs of each individual within the team

He shifted the attention from describing the behaviour of the leader to understanding the needs of the situation in these three key areas.

Each group, team and organisation has its own unique culture, made up as follows:-

A leader needs to establish a real partnership with the rest of the organisation to meet its aims and treat people as partners; they will respond accordingly.

There are seven qualities of a strategic leader:

- Direction (purpose and aim of the business)
- Strategic thinking (bridging the gap between now and the future)
- Making it happen (details)
- Relating the whole to the parts
- Establishing allies & partners outside the business
- Releasing corporate energy
- Develop leadership in the others

Adair observed that there are 'Four paths up the mountain'

- What you are
- What you know
- What you do
- What you believe

In the 1990s, Peter Senger at MIT, said that leaders needed to address 5 key areas:

- Developing everyone's view of the bigger picture through systems thinking;
- Developing personal mastery at all levels
- Challenging the mental models and beliefs of the organisation
- Developing teams that captured their learning
- Promoting a shared vision throughout the organisation

Yet another way of describing leaders is to describe what they do as either:

- Transactional: People do what they do because they are paid to, or
- Transformational: Where the leader inspires them, and creates & shares his/her vision.

It used to be rather simplistically thought that leaders were one or the other. In real life most will be able to use both to some degree, however the better the leader the more they have access to both. To move from transactional to transformational a leader needs to develop the following five skills:

Perceptual

Being able to see things from many, different perspectives; seeing others' points-of-view, seeing the 'big picture'

Communication

Being able to persuade, listen and present well

Displaying Conviction

Being passionate and committed to the agreed course of action (in times of change people need certainty... even if it is sometimes illusory!)

Empathy

To be able to see things from others' view-points

Resilience

The ability to keep at it, to overcome the inevitable problems along the way, and, once you have arrived to make everyone realise that the journey isn't over!

It has been estimated by some academics that the untapped potential of some organisations is as high as 80%! Clearly the job of any leader is to marshal his assets and resources as effectively as possible and it really is true that 'people are your greatest asset'! This is why modern leaders are now required to demonstrate high Emotional Intelligence (EI as opposed to IQ). The key attributes that Daniel Goleman identifies are:

- Self awareness
- Self management
- Motivation
- Social awareness
- Social skills

In reviewing various management styles the four most effective ways to build positive emotional capital are:

- Using cross functional teams
- Creating a shared vision
- Coaching
- Using democratic decision making processes

Of course, this brief overview is by no means exhaustive, but I hope that you find it useful. It does capture some of the key threads & themes that leaders need to focus on. My personal summary of leadership would be:

- Create & share a clear compelling vision
- Focus on the customer
- Bring in the best people and bring out the best that they have to offer
- Communicate regularly and clearly. Always making as much time to listen as to speaking
- Be honest, people already know three quarters of the truth!
- Be positive & enthusiastic
- Plan & measure the things that will make a difference
- Be sensitive in choosing when you need to be supportive and when you need to be hard on people
- Recognise that sometimes you need to stop, regroup and even to retreat a little, but you never stop
- Moving forward
- People will go much further with a little bit of honest praise and recognition, so never 'hog the glory'!
- Make Change a permanent feature of your culture

A basic model for an effective succession plan has been conceptualized in this study. A brief explanation for a better understanding of the model is hereby enlisted.

REFERENCES

- [1] The present leader has to identify the kind of leadership quality his/her prospective successor has.
- [2] It can either be "Great Man", born with the qualities of being a great leader, or it has to be "Behavioural", yearns and learns to be a leader.
- [3] "Great Man" identifies with the Trait Theory which states that a great leader is born with the qualities and traits of a great leader.
- [4] "Behavioural" contrasts the former by stating in the Contingency Theory that a great leader learns as he/she passes through the phases of life and bases those learning's to become a leader.
- [5] Irrespective of which quality the prospect bears he/she has to be trained in the basics to be the best leader.
- [6] The basics have evolved over time and according to me now there are only three basic kinds of leaders who are successful.
- [7] Participative leaders who involve their teams into the decision making process and hence enhance not only the problem solving capacity of the team but also imbibe a sense of importance and belongingness amongst the team mates.
- [8] Transactional Leaders who base their leadership on a system of reward and punishment. Often the most widely used kind in most of the organizations.
- [9] Transformational Leaders who believe in the philosophy of "PULL", i.e. if they have to make their team do a particular job or behave in a particular manner they have to inspire them to do so by firstly setting an example in front of them by doing so themselves. Perhaps the most effective form of leadership but least used because of various organizational, professional and personal constraints.

- [10] These modern styles of leadership are interdependent and based on the situation one has to modify his/her style of leading the subordinates. We hence, cannot state that either of the three is the best or perfect style of leadership but yes a dexterous combination of all the three will result in impeccable efficiency for a leader.
- [11] The prospect should be allowed to innovate and take risks but should be taught never to leave the basics because if something goes wrong the basics will set it straight.
- [12] The prospect should be given freedom to take his/her own decisions, develop his/her own panache, but the trainer should always be there when the prospect falters.
- [13] Personally speaking, if these traits are imbibed in a prospective successor he/she will prove to be a very worthy asset to the organization and a more worthy successor to his/her predecessor.
- [14] One last word of caution, never should the predecessor try to find his/her own mirror reflection in the successor as like snowflakes every individual is unique in his/her own identity and uniqueness is what the world needs right now.

Both the amount of information available on the Internet (a), and the number and diversity of its users (b), are growing rapidly. This diverse population of users will not settle for a uniform interface to the information, but will demand personalized presentations and access methods (c). This personalization will range from different presentation formats to complex techniques for searching, filtering and organizing the vast quantities of information (d). Today, such personalization facilities are provided at the information source in a site-specific manner (e), at a proxy Web site (f), or (occasionally) as client software.

Meanwhile, the network technology will lead to an increased gap in the bandwidth of the core Internet versus the fringes of the Internet (g). Thus, most client hosts will shun large transfers of data (h). That trend encourages the migration of application functionality from clients into proxy sites (f), which are presumably better connected to the core Internet, and need send only the final results over the slower connection to the client. Furthermore, the dramatic availability of core bandwidth will allow these proxy sites to be aggressive in gathering, perfecting, and caching information on behalf of their clients.

Mobile users (i) will frequently disconnect from the network, and perhaps connect later at another location with poor bandwidth (j). This tendency again leads to the use of proxies (f). It also encourages application programmers to choose a mobile-code solution to dynamically install the necessary client code (k) onto the Web terminal or portable device. Moving code (applets) to the client allows a high level of interaction with the user despite a high-latency, low-bandwidth, or disconnected network.

Ultimately, Web sites and other Internet services will not be able to efficiently provide the full range of customization desired by their clients, and clients will want to use the same information-filtering and -organizing tools across many sites. Moreover, fixed-location, application-specific proxies will become bottlenecks, and as user needs change, may no longer be at the best network location for accessing the proxy services. As a result, customization tools will be specified as software, in the form of mobile code that runs either on the server, or on a dynamically selected proxy site (m) near the server (or client, as appropriate). Mobile code is necessary, rather than client-side code, since many customization features (such as information monitoring) do not work if the client is disconnected, has a low-bandwidth connection, or requires frequent communication with the server. Mobile code is beneficial, since servers and proxy sites need provide only a generic execution environment (along with an API that provides programmatic access to their service); the actual customization tools can be written by the services themselves, by third-party middleware developers, and even by the end users.

Finally, many clients will wish to send mobile code to multiple information sites as part of a single task. Although there will be applications for which the mobile code can be sent in parallel, many tasks require a sequence of subtasks, each at a different site. To avoid latency (n), the application programmer will often want to avoid a "star-shaped graph" (o) where mobile code goes out to the first site and sends its results back to the client or proxy, the same or different piece of mobile code goes out to the second site, and so on, and the programmer will always want to be able to select the best migration strategy for the task and current network conditions. In other words, the mobile code must be able to hop sequentially through multiple sites; such multi-hop mobile code is a mobile agent.

MOBILE AGENTS IN E-COMMERCE

The number of people buying, selling, and performing transactions on the internet is expected to increase at a phenomenal rate. The application of MAs to business provides a new way to conduct e-commerce to business to business, business to consumer, and consumer to consumer transactions. We classify existing MA applications in e-commerce into three categories viz. shopping agents, salesman agents, and auction agents.

Shopping Agents

These MAs make purchases in e-market places on behalf of their owner according to user defined specifications. This model of e-commerce user customer driven market place. Typical shopping agents may compare features of different products by visiting several online stores and report the best choice to its owner. The MA carries the set of features to be considered and their ideal values as specified by its owner. It is given one or more sites to visit and may dynamically visit other site based on subsequent information. Since Ma moves to the source of information, the overhead of repeatedly transferring potentially large amounts of information over a network is eliminated. One example of a system that implements shopping agent is MAgNET, where agents deal with procurement of many components needed to manufacture a complex product.

Salesman Agents

These MAs behave like travelling salesman who visits customers to sale his wares. This model of e-commerce uses supplier drive market place and is particularly attractive for a product with short shelf-life. A supplier creates and dispatches an MA to potential buyers by giving it a list of sites to visit. The MA carries with it information about availability of stock and price of product.

Corporate Social Responsibility—Towards Stakeholders

Satish C. Sharma¹ and Preeti Goswami²

¹Professor (Honorary) & CMD, Maharaja Group of Colleges, Udaipur

²Assistant Professor, Maharaja Group of Colleges, Udaipur

Abstract—Today big business houses and corporate have been cawing many social welfare activities from time to time, the priority of business houses is getting widened from IP to 3 Ps by including people and planet with profit. Corporate social responsibility is relevant for business in all societies, it is particularly very important for developing countries like India where there are society of resources to meet the ever-growing demand and making a process of sustainable development more challenging. CSR is “the process by which managers within an organization think about and discuss relationships with stakeholders as well as their roles in relation to the common good, along with their behavioral disposition with respect to the fulfillment and achievement of these roles and relationships.” Development business ethics is one of the forms of applied ethics that examines ethical principles and moral or ethical problems that can arise in a business environment. Every organization operates in a multiple stakeholder arena where each stakeholder is likely to hold different expectations of how it should operate. CSR is important for an organization’s success for two primary reasons: (1) To enhance its reputation as being morally bound to rectitude, a rational discretionary choice bringing in economic benefits, a means for boosting brand equity and sales, and (2) to advance the organization’s credibility and character in public policy battles and during the early stages of a crisis. CSR is the foundation for understanding and meeting the challenges of global stakeholders. In the last half of the 20th Century, activist publics formed to change every aspect of business and government.

Keywords: CSR, Stakeholders, Initiative.

INTRODUCTION

Today big business houses and corporate have been cawing many social welfare activities from time to time, the priority of business houses is getting widened from IP to 3 Ps by including people and planet with profit. Corporate social responsibility is relevant for business in all societies, it is particularly very important for developing countries like India where there are society of resources to meet the ever-growing demand and making a process of sustainable development more challenging. Corporate social responsibility is basically a new business strategy to reduce investment risks and maximize profit by taking all the key shareholders into confidence. Many companies often use this concept in their advertising and social marketing initiative. The concept of social responsibility of business was considered even in the early part of 20th century, the modern evaluation of the concept can be dated from 1950s. The concept got much impetus in past 2 – 3 decades.

“Corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of workforce and their families as well as the local community and society at large.”

CSR is “the process by which managers within an organization think about and discuss relationships with stakeholders as well as their roles in relation to the common good, along with their behavioral disposition with respect to the fulfillment and achievement of these roles and relationships.” CSR is “the continuing commitment by business to behaving ethically and contributing to economic development while improving the quality of life of the work force and their family as well as the community and society at large”

Corporate social responsibility is a form of corporate self-regulation integrated into a business model. CSR policy functions as a built-in, self-regulating mechanism whereby a business monitors and ensures its active compliance with the spirit of the law, ethical standards, and international norms. The goal of CSR is to embrace responsibility for the company’s actions and encourage a positive impact through its activities on the environment, consumers, employees, communities, stakeholders and all other members of the public sphere. CSR is titled to aid an organization’s mission as well as a guide to what the company stands for and will uphold to its consumers. Development business ethics is one of the forms of applied ethics that examines ethical principles and moral or ethical problems that can arise in a business environment. Every organization operates in a multiple stakeholder arena where each stakeholder is likely to hold different expectations of how it should operate.

NATURE OF CORPORATE SOCIAL RESPONSIBILITY

Basis of the Concept

The concept of CSR is based on the premises that business organizations are not independent entities but are dependent on society. They survive and thrive on the resources, markets and support the society. Therefore, they are responsible not only to the shareholder but also all other stakeholders.

A Comprehensive Concept

CSR comprehensive concept which requires business organizations to fulfill four type of responsibilities.

- Economic Responsibility
- Legal Responsibility
- Ethical Responsibility
- Discretionary responsibility

Two-way Process

CSR is two way process. Business owes responsibility towards the society. Similarly, the society is also in turn responsible to the business.

Continuous Commitment

CSR is a continuous commitment by business organization to behave economically, legally and ethically as per the expectation of the society.

It is Pervasive at All Levels

The concept of CSR is pervasive at all levels of the organization. The manager at all levels of the organization should involve in some kind of social action and contribute to the discharge of social responsibility of a business.

WHY IS CSR IMPORTANT?

CSR is important for an organization's success for two primary reasons: (1) To enhance its reputation as being morally bound to rectitude, a rational discretionary choice bringing in economic benefits, a means for boosting brand equity and sales, and (2) to advance the organization's credibility and character in public policy battles and during the early stages of a crisis.

Mutual, Aligned Interests and Moral Argument

CSR is the foundation for achieving mutually aligned interests and winning the moral argument about the social relevance of the organization. Systematic consideration of CSR can be used to reduce friction and increase harmony with stakeholders and increase the organization's strategic business advantage. To do so requires issue monitoring and critical thinking which is second nature to effective strategic issues management as public relations:

- Ascertain the standards of corporate responsibility held by key stakeholders.
- Compare those standards to those preferred and used by the organization.
- Determine whether differences exist and, if so, whether they strain the relationship.
- Ascertain whether differences in facts account for the disparity in expectations.
- Decide whether value differences constitute the disparity between the organization and its key stakeholders.
- Budget for change options, whether communication strategies, public policy efforts, or redefined strategic business strategies to respond to stakeholder expectations.
- Alter performance or operating standards to lessen the legitimacy gap.
- Take a communication or public policy stance based on correct facts or preferred values when the community interest would be better served.
- Eliminate misunderstanding and disagreement by supplying facts or redefining standards vital to the community interest.
- Incorporate preferred standards of corporate responsibility in strategic business planning, and communicate with key external stakeholders.
- Integrate standards into individual, unit, and corporate performance review, including efforts to achieve total quality management.
- Use improved standards of corporate responsibility to achieve competitive advantage.
- Integrate these standards into product, service, and organizational reputation messages.
- Achieving mutually beneficial interests is not easy in a multiple-stakeholder- environment.

Cost Reduction and Marketing Advantage (Rational and Economic Arguments)

CSR is important because it is the foundation for reducing cost and gaining marketing advantage.

- Cost reduction: CSR can reduce cost. Conflict can raise costs, through litigation, legislation, and regulation. These can be dysfunctional means for making decisions of public policy when outrage drives the discussion of stakeholder expectation.
- Marketing advantage: By achieving appropriate standards of CSR, an organization has a more favorable image and is preferred by customers and other commercial stakeholders.

Globalization/ Free Flow of Information and Changing Trends (Reflectiveness and Stakeholder Expectations)

CSR is the foundation for understanding and meeting the challenges of global stakeholders. In the last half of the 20th Century, activist publics formed to change every aspect of business and government. For this reason, the stakeholders of any organization play an increasingly important role in its standards of CSR.

How to Implement CSR

Organizations implement CSR depends on how they define it, whether as a moral obligation and a rational approach to stakeholder satisfaction. It serves best when it is part of organizations' culture, planning, and management. It has implications for budgeting, return on investment, and measures of effectiveness. As mentioned above, public relations practitioners not only participate in the dialogue to define CSR standards but they also play a crucial role in helping markets, audiences, and publics to be aware of the standards client organizations are willing and able to implement.

Three-factor Model of CSR Implementation and Application to Public Relations

Cognitive: Matters of identity and legitimacy that define what and how firms think

Linguistic: Matters of justification, positioning, and transparency that define what firms say

Conative: Matters of posture, consistency, and commitment that define how firms behave.

Practitioners can participate in the cognitive, linguistic, and conative aspects of their organizations to foster the alignment of mutually beneficial interests in society.

Cognitive: Public relations, through issues monitoring, can play a vital role in helping the organization to know and think about changing CSR standards and the means for achieving them.

Linguistic: Exploring the interconnection of communication and management observed that these two disciplines "have similar objectives: both disciplines are seeking to enhance the quality of the relationship of an organization among key stakeholder groups. Both disciplines recognize that to do so makes good business sense"

Conative: Discussing the conative dimension of CSR, reasoned that it focuses on matters of posture, consistency, and commitment that define how firms tend and prefer to behave. Organizations enact the standards of CSR in all that they say and do. The operational enactment of each organization's standards of CSR occurs by "putting their money where their mind and mouth are."

In this way, effective public relations can foster mutually beneficial relationships, which reasoned exhibit the following characteristics:

Openness and Transparency: Letting others see whether the organization has sound CSR principles and whether it meets them

Trustworthiness: Demonstrating that the organization uses CSR principles to be seen as reliable, non-exploitative, and dependable.

Cooperation: Enacting collaborative decision making regarding what standards should be met and the measures needed to achieve them

Alignment: Showing that the organization is responsible, responsive, and able to achieve rectitude through shared interests, rewards, and goals with its stakeholders

Compatibility of Views/Opinions: Co-creating (socially constructing) through dialogue the standards and implementation of CSR

Commitment: Planning and operating in ways that achieve a balance between the interests of the organization and those of the persons whom the organization affects and whose support the organization needs for its success.

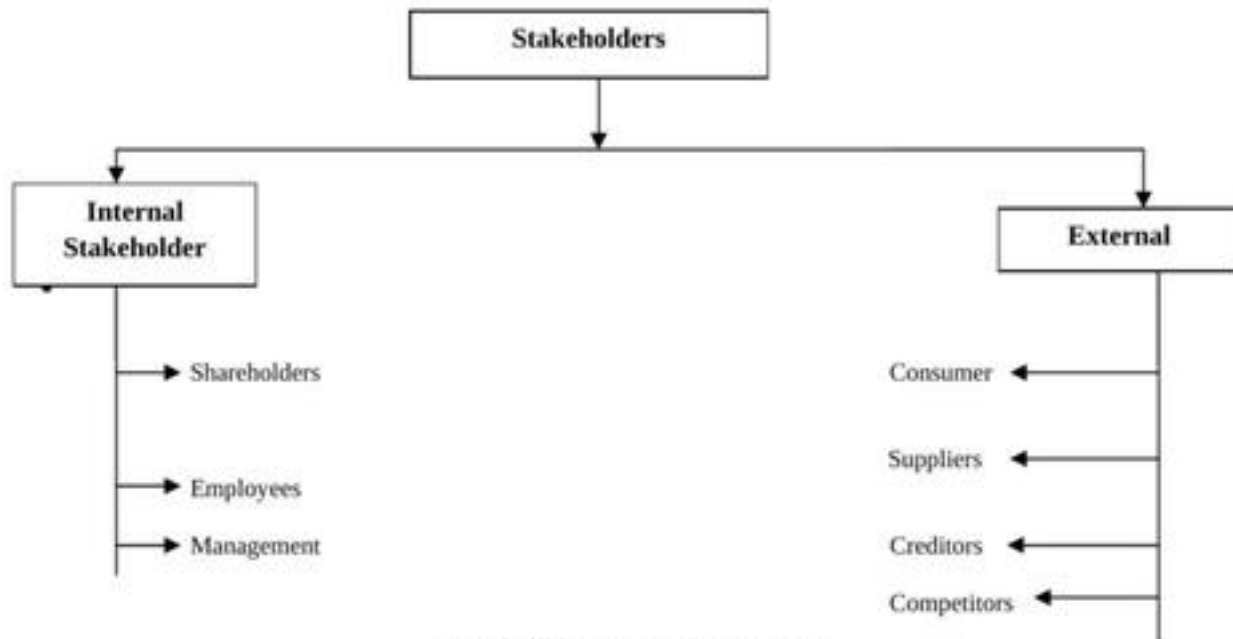


Fig. 1: Classification of Stakeholders

Responsibility towards Shareholder/ Owners

- To make proper use of their funds within their authority.
- To ensure safety and growth of their investment.
- To held meetings from time-to-time and give proper notice of them to all the share holders.
- To send copies of annual reports and other document as required by the law

Responsibility towards Customers

- To ensure supply of goods and services of right quality, at right time, at right place and right price.
- To enhance product safety.
- To reduce polluting potential of products.
- To improve the nutritional value of the products.

Responsibility towards Employees

- To employee all the employees at the right job.
- To pay fair wages, salary, bonus etc.
- To ensure healthy and safe working environment & conditions.
- To provide adequate benefits such as housing, medical facilities, insurance cover, retirement benefits etc.

Responsibility towards Suppliers

- To ensure timely payment of all the bills due.
- To make every effort to ensure long term sound business relationship.
- To ensure proper performance of terms of contract.
- To provide opportunity to new suppliers.

Responsibility towards Competitors

- To play fair game in competition for encouraging healthy competition.
- Avoid misleading advertisement
- To ensure free enters of competitors for the healthy growth of trade and economy.
- To respect competitors and treat them as challengers and not enemies.

Responsibility towards the Government

- To comply with the laws and regulations of the land.
- To pay the taxes and duties honestly within the time.
- To actively contribute the economic development of the country.
- To provide data required by the government.

Responsibility towards Local Community and Environment

- To provide employment opportunities to local people.
- To contribute to upliftment of weaker section of the community.
- To encourage the local trade.
- To ensure efficient and effective utilization of all local resources.

Besides these main stakeholders, business also owns its responsibility towards creditors, financial institutions, world trade community, professional bodies, social welfare organizations, ecological environment etc.

The Business Benefits of Corporate Social Responsibility

Corporate social responsibility (CSR) isn't just about doing the right thing. It means behaving responsibly, and also dealing with suppliers who do the same. It also offers direct business benefits. Building a reputation as a responsible business sets you apart. Companies often favour suppliers who demonstrate responsible policies, as this can have a positive impact on how they are perceived by customers. Reducing resource use, waste and emissions doesn't just help the environment - it saves your money too. It's not difficult to cut utility bills and waste disposal costs and you can bring immediate cash benefits. For more information read our guide on how to save money by reducing, reusing and recycling waste.

There are Other Benefits Too

- A good reputation makes it easier to recruit employees.
- Employees may stay longer, reducing the costs and disruption of recruitment and retraining.
- Employees are better motivated and more productive.
- CSR helps ensure you comply with regulatory requirements.
- Activities such as involvement with the local community are ideal opportunities to generate positive press coverage.
- Good relationships with local authorities make doing business easier.
- Understanding the wider impact of your business can help you develop new products and services.
- CSR can make you more competitive and reduces the risk of sudden damage to your reputation (and sales). Investors recognize this and are more willing to finance you.

CORPORATE SOCIAL RESPONSIBILITY: INITIATIVES AND EXAMPLES

Anand Corporate Services Limited

Anand has a longstanding commitment to addressing the needs of the society, in view of its belief that for any economic development to be meaningful, the benefits from the business must trickle down to the society at large. Anand is of the firm view that the corporate goals must be aligned with the larger societal goals. 25 years ago, the SNS Foundation, an expression of Anand's corporate social responsibility, was born. The objective of SNS foundation was comprehensive community development. The Foundation has created programs in the fields of health, education, natural resource management and life skills training, only to make sure that fellow humans could breathe easy.

The long term goal of Anand CSR is to implement concepts like 'Zero Tolerance Zone for Child Labour', 'Zero Waste Zone' using strategies like Reduce, Recycle and Reuse not only at Anand/SNSF locations but extend to Anand residential areas.

Aptech Limited

Aptech Limited, a leading education player with a global presence, has played an extensive and sustained role in encouraging and fostering education throughout the country since inception. As a global player with complete solutions-providing capability, Aptech has a long history of participating in community activities. It has, in association with leading NGOs, provided computers at schools, education to the underprivileged and conducted training and awareness-camps. Aptech students donated part of the proceeds from the sale of their art work to NGOs. To propagate education among all sections of the society throughout the country, especially the underprivileged, Aptech fosters tie-ups with leading NGOs throughout the country, including the Barrackpur-based NGO, Udayan, a residential school for children of leprosy patients in Barrackpur, established in 1970. The company strongly believes that education is an integral part of the country's social fabric and works towards supporting basic education and basic computer literacy amongst the underprivileged children in India.

ICICI Bank Ltd

The Social Initiatives Group (SIG) of ICICI Bank Ltd works with a mission to build the capacities of the poorest of the poor to participate in the larger economy. The group identifies and supports initiatives designed to break the intergenerational cycle of poor health and nutrition, ensure essential early childhood education and schooling as well as access to basic financial services. Thus, by promoting early child health, catalyzing universal elementary education and maximizing access to micro financial services, ICICI Bank believes that it can build the capacities of India's poor to participate in larger socio-economic processes and thereby spur the overall development of the country. The SIG works by understanding the status of existing systems of service delivery and identifying critical knowledge and practice gaps in their functioning.

Infosys Technologies Limited

Infosys is actively involved in various community development programs. Infosys promoted, in 1996, the Infosys Foundation as a not-for-profit trust to which it contributes up to 1%PAT every year. Additionally, the Education and Research Department (E&R) at Infosys also works with employee volunteers on community development projects. Infosys leadership has set examples in the area of corporate citizenship and has involved itself actively in key national bodies. They have taken initiatives to work in the areas of Research and Education, Community Service, Rural Reach Programme, Employment, Welfare activities undertaken by the Infosys Foundation, Healthcare for the poor, Education and Arts & Culture.

Mahindra & Mahindra

The K. C. Mahindra Education Trust was established in 1953 by late Mr. K. C. Mahindra with an objective to promote education. Its vision is to transform the lives of people in India through education, financial assistance and recognition to them, across age groups and across income strata. The K. C. Mahindra Education Trust undertakes number of education initiatives, which make a difference to the lives of deserving students. The Trust has provided more than Rs. 7.5 Crore in the form of grants, scholarships and loans.

Dalmia Cement (Bharat) Limited

The water source for the villages in and around the Dalmia Cement factory is dependent on rains. During summer months, the villagers, particularly women folk, travel long distances to fetch water for drinking and other purposes. Considering the difficulties and hardship faced by the people, the company, after discussing with the village elders and concerned Government authorities, took the initiative of making water available. Providing deep bore wells. So far, 45 bore wells have been provided in various villages, namely Kallakudi, Palanganathan, Malvoi, Elakkurichi, Muthuvathur, Pullabmadi, Edayathankudi etc. Approximately, 300 to 400 people get adequate drinking water from each bore well.

CONCLUSION

Corporate social responsibility (CSR) isn't just about doing the right thing. It means behaving responsibly, and also dealing with suppliers who do the same. It also offers direct business benefits. Building a reputation as a responsible business sets you apart. Companies often favour suppliers who demonstrate responsible policies, as this can have a positive impact on how they are perceived by customers. Reducing resource use, waste and emissions doesn't just help the environment - it saves your money too. It's not difficult to cut utility bills and waste disposal costs and you can bring immediate cash benefits. CSR is the foundation for achieving mutually aligned interests and winning the moral argument about the social relevance of the organization. Systematic consideration of CSR can be used to reduce friction and increase harmony with stakeholders and increase the organization's strategic business advantage. To do so requires issue monitoring and critical thinking which is second nature to effective strategic issues management as public relations

REFERENCES

- [1] Wood, D. "Corporate Social Performance Revisited" (1991)
- [2] Freeman, R., "Strategic management : a stakeholder approach" (Pitman 1984)
- [3] Saether, Kim T. & Aguilera, Ruth V., (2008), "Corporate Social Responsibility in a Comparative Perspective". In Crane, A., et al. (PDF), *The Oxford Handbook of Corporate Social Responsibility*. Oxford: Oxford University Press.
- [4] Habisch, André; Jan Jonker, Martina Wegner, Schmidpeter, R. (eds.) (2005), *Corporate Social Responsibility across the Europe*. Heidelberg: Springer. ISBN 978-3-540-23251-3.
- [5] Gray, R.H., Owen, D.L., & Maunders, K.T., "Corporate Social Reporting: Accounting and accountability", (Hemel Hempstead: Prentice Hall, 1987) p. IX.
- [6] "Corporate Social Responsibility and Ethical Careers". University of Edinburgh Careers Service. Retrieved 2008-03-07.
- [7] <http://www.fairtrade.org.uk/work/case_studies/read_a_case_study/default.aspx?ID=40>

Corporate Social Responsibility and its Strategic Utility

Garima

Asst. Professor, Surajmal College of Engineering and Management, U.S. Nagar, Uttarakhand

Abstract – Corporate Social Responsibility (CSR) is becoming an increasingly important activity to businesses nationally and internationally. As globalization accelerates and large corporations serve as global providers, these corporations have progressively recognized the benefits of providing CSR programs in their various locations. CSR activities are now being undertaken throughout the globe. The subject of the research covers well known Organizations / Companies of Udham Singh Nagar region out of the total population the sample constitute only a limited no. of well reputed organizations of Industrial Estate, Sidcul Pantnagar, Uttarakhand. I personally believe that the company should follow Corporate Social Responsibility with every respect and it is one of the most burning issues of current scenario. Hence it attracted my concern towards it. Does their effort are really worth while or they are doing this just for sake of doing? The basic aim of the study is to gain familiarity or formulating a problem or to achieve new insights into it. In this particular study, an attempt has been made to comprehend and gain insight into behavior or attitude of companies towards various aspects of social contribution. It tries to identify complex behavior and set patterns in it. The present study relates to the attitude of 50 companies in Industrial Estate, Sidcul Pantnagar, and Uttarakhand Pantnagar so as to predict the behavior. Why will any company give funds or services to a non-profit? The result of the present study suggests that Corporate Social Responsibility has the potential to be used as a strategic advantage. it is also recommended that organizations strategy on Corporate Social Responsibility must be in line with their core competency to provide them with a competitive edge. CSR can no longer be seen as "one-size-fits-all" approach, but companies need to be explicit about what their Corporate Social Responsibility approach is and why this approach is appropriate for them. Today companies ought to invest in Corporate Social Responsibility as part of their business strategy to become more competitive.

Keywords: Corporate Social Responsibility, Its Implementation, Strategic Utility.

INTRODUCTION

Business and Society are interdependent. Society depends on business for meeting its needs and welfare, whereas, Business depends on society for its existence and growth.

Corporate Social Responsibility is an ethical or ideological theory; a doctrine, how an entity whether it is a government, corporation, organization or individuals has a responsibility to society and can be defined as, "the obligation of business to pursue those policies, to make those decisions or to follow those lines of actions which are desirable in terms of the objectives and values of your society". Corporate social responsibility (CSR) also called corporate responsibility, corporate citizenship, responsible business and corporate social opportunity¹ is a concept whereby organizations consider the interests of society by taking responsibility for the impact of their activities on customers, suppliers, employees, shareholders, communities and other stakeholders, as well as the environment. This obligation is seen to extend beyond the statutory obligation to comply with legislation and sees organizations voluntarily taking further steps to improve the quality of life for employees and their families as well as for the local community and society at large.

The Utilitarian Principle Says

Act in a way that results in the greatest goods for the greatest number. The Social Responsibility Concept is beneficial to the Business and the Society. "The most significant contribution organized industry can make is by identifying itself with the life and the problems of the people, of the community to which it belongs, and by applying its resources, skills and talents to serve and help them"- Late J. R. D. Tata .To develop a model that bridges the gap between CSR definitions and strategy and offers guidance to managers on how to connect socially committed organizations with the growing numbers of ethically aware consumers to simultaneously achieve economic and social objectives.

The practice of CSR is subject to much debate and criticism. Proponents argue that there is a strong business case for CSR, in that corporations benefit in multiple ways by operating with a perspective broader and longer than their own immediate, short-term profits.

Critics argue that CSR distracts from the fundamental economic role of businesses; others argue that it is nothing more than superficial window-dressing; still others argue that it is an attempt to preempt the role of governments as a watchdog over powerful multinational corporations. Definitional issues regarding "corporate social responsibility" (CSR) have been debated since many years. Early CSR models was initiated in the early 1960s. It showed the "social" aspect of CSR as referring directly to those responsibilities above and beyond economic and legal obligations (Carroll, 1979⁴; Waddock, 2004⁵; Matten and Crane, 2005⁶). Many considered corporate social responsibility synonymous with voluntary and philanthropic acts by business organizations which are designed to alleviate social ills or in order to benefit a disadvantaged group chosen by the corporation's managers. Thus, corporate social responsibility has been a topic that has received a lot of attention in recent years (Sethi, 1995)⁷

Traditionally, CSR has been defined much more in terms of a philanthropic model. Companies make profits, unhindered except by fulfilling their duty to pay taxes. Then they donate a certain share of the profits to charitable causes. It is seen as tainting the act for the company to receive any benefit from the giving.

RELEVANCE OF THE STUDY

The basic aim of the study is to gain familiarity or formulating a problem or to achieve new insights into it. In this particular study, an attempt has been made to comprehend and gain insight into behavior or attitude of companies towards various aspects of social contribution. This study deals with the behavior of the corporate. It tries to identify complex behavior and set patterns in it. The present study relates to the attitude of 50 companies in industrial estate, Sidcul pantnagar, uttrakhand so as to predict the behavior. Why will any company give funds or services to a non-profit? The government will provide for funds and or services as it is responsible for the social welfare of the people. Similarly a charitable institution will do the same as it is their objective to help the social cause.

REVIEW OF LITERATURE

According to Philip Kotler⁸, "Corporate Social Responsibility: Doing the Most Good for your Company and Cause" does a terrific job of describing the range of corporate social initiatives and suggests best practices for choosing, implementing and evaluating them.

"CSR is about capacity building for sustainable livelihoods. It respects cultural differences and finds the business opportunities in building the skills of employees, the community and the government" "CSR is about business giving back to society.

*The World Business Council for Sustainable Development*⁹ in its publication "Making Good Business Sense" by Lord Holme and Richard Watts, used the following definition. "Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large"

In 2001, Kaliski believed, "In today's society a business must maintain ethical principles in order to be successful. Business can use ethical decision leading to strength their business in three main ways. The 1st way is to use their ethical decision making to increase productivity of the employees, the 2nd way to strengthen their business is by making ethical decisions towards their stakeholders that are outside of the business environment, viz customers and suppliers and the 3rd way that business can use ethical decision making to secure their business is by making decisions that allows the government agencies to minimize their involvement with the corporation."¹⁰

Social Responsibility is voluntary; it is about going above and beyond what is called for by the legal responsibility; it cannot be imposed by law, thus, it needs willing acceptance and self discipline. As the golden rule says, "Act in a way you would want others to act toward you."

According to *Renowned Indian Jurist Nani Palkivala*, "What is the point in having laws and laws upon laws if your inner consciousness is not there, which enables you to do right things for a right conclusion. In other words; if you are to looking for fairness and justice all around it has to be found within the heart of the businessmen. If the ethical sense dies in the heart of the businessmen, no constitutions, no law, no court can save it. It is only within yourself that you have to find the ideals you are struggling to establish."

In the famous words of *Ernest Dale*, "It is the duty of business to provide fair returns to the shareholders, fair working conditions to the employees, fair deal to the suppliers and customers to make the business an asset to the local community and the nation.

THEORETICAL FRAMEWORK

The evolving idea of Corporate Social Responsibility Some major stages of the evolution from the long history of Corporate Social Responsibility are outlined here

Business Corporate Social Responsibility in Classical Economic Theory

Throughout history, classical economic theory has been the fundamental of people in business. In the classical economic view a business is acting in a socially responsible fashion if it utilizes resources as efficiently as possible to produce goods and services that society wants at prices consumers are willing.

The Eighteen and Nineteen Centuries

In the colonial era, business were very small merchant practiced thrift & frugality, which were dominant virtues then, but charity was the co-existing virtue.

In the early nineteenth century, companies were not effusive in their social concerns. Charitable contribution continued and grew over time as great fortune in business was made.

Changing View of Business Corporate Social Responsibility in Late Nineteenth and Early Twentieth Century

1920s, three inter-related themes had emerged to justify broader business social responsibility. *First*, managers were trustees, i.e. agents whose corporate role put them in positions of power where they could enhance the welfare of not only the shareholders, but others such as customers, employees & communities. *Secondly* managers believe they had an obligation to balance the interest of these groups. And *Thirdly*, Many managers subscribe to service principle with two distinct definitions'. *One* definition was near –spiritual belief, by operating for profit, had the power to redeem society by creating a broad general welfare. A *Second* understanding of the service principle managers have obligation to undertake social programme.

The Contemporary View of Corporate Social Responsibility

The concept of Corporate Social Responsibility has continued to evolve & expand due to accelerating industrial activity continuously changes society. "Today corporations carry out a wide array of social actions. The span include programmes for education, public health, employee welfare, housing, urban renewal, environmental protection, resource conservation, day care centers for working parents and many others. In each of these areas, the programmes that different corporation have implemented run into thousand."⁽³⁾

RESEARCH METHODOLOGY

Choice of Subject

The subject of the research covers well known Organizations / Companies of Udham Singh Nagar region out of the total population the sample constitute only a limited no. of well reputed organizations of INDUSTRIAL ESTATE, SIDCUL PANTNAGAR, UTTARAKHAND.

The preliminary purpose is to understand the thrust of corporate social responsibility obligation followed in the various companies & to investigate why a company follows Corporate Social Responsibility where as the prime objective of the business is to earn profit only. Attractiveness of the subject also lies in its strategic utility, to investigate Social Responsibility as a strategic utility by various companies.

Preconception

The total number of registered company in INDUSTRIAL ESTATE, SIDCUL PANTNAGAR, and UTTARAKHAND including various sectors is 400.

Objective

The overall objective of the thesis is to understand companies' awareness of Corporate Social Responsibility & Its Strategic Utility. The empirical study fulfills the following objectives:

- To understand the thrust of CSR policies of companies & to assess how far they differ from each other.
- To assess employees awareness & understanding of Corporate Social Responsibility.
- Challenges in the fulfillment of CSR
- To understand the relation between CSR fulfillment & financial stability of a company.
- To determine the strategic utility of CSR for the various companies.

SUGGESTION FOR FUTURE RESEARCH

The validity and generalizability of the results of the current study is limited to the SIDCUL Pantnagar Region with limited no. of organizations. For future research a large no. of organization may be studied for understanding Corporate Social Responsibility.

LIMITATIONS OF THE STUDY

Time is one of the important limitations as relatively lesser time is available for research. The following findings are based on survey conducted in INDUSTRIAL ESTATE, SIDCUL PANTNAGAR, UTTARAKHAND, region only, area covered is also limited that can't be used to make general predictions.

CONCLUSION

The result of the present study suggests that Corporate Social Responsibility has the potential to be used as a strategic advantage. It is also recommended that organizations strategy on Corporate Social Responsibility must be in line with their core competency to provide them with a competitive edge. CSR can no longer be seen as "one-size-fits-all" approach, but companies need to be explicit about what their Corporate Social Responsibility approach is and why this

approach is appropriate for them .today companies ought to invest in Corporate Social Responsibility as part of their business strategy to become more competitive. More ever companies should have specific & unified Corporate Social Responsibility policies which should be in line with their vision & objective. Corporate Social Responsibility should not be systematic and planned approach to be developed for the fulfillment of Corporate Social Responsibility. Thrust of Corporate Social Responsibility policies of companies is not same they have a remarkable variation in their thrust Companies' objective behind fulfilling of Corporate Social Responsibility is "To make a difference in the life of those who really need this."

REFERENCES

- [1] Kathryn, M. Bartal and David, C. Martin, Management, Mc Graw-Hill, 1988, p.113.
- [2] Gita Piramal, book review again 493
- [3] George, A. Steiner and John, F. Steiner, Business Government Society McGraw Hill, 1997, p.106.
- [4] Carroll, A.B. (1979) , "A three dimensional conceptual model of corporate social performance" Academy of management review,4(4), 497-505.
- [5] Carroll, A. B., (1979), "the pyramid of Corporate Social Responsibility: Towards the moral management of organizational stakeholders", business horizons 34 (4), pp. 39-48.
- [6] Carroll, A.B., (1979), "the pyramid of Corporate Social Responsibility: Towards the moral management of organizational stakeholders", business horizons.
- [7] Carroll, A. B., (1999), "the pyramid of Corporate Social Responsibility: Towards the moral management of organizational stakeholders", business horizons.
- [8] Carroll, A.B., (1998), "The four faces of corporate citizenship, business and society" review 100[1],p 1-7
- [9] Carroll, A.B., (2004), ".Managing ethically with global stakeholders: A Present and future challenge. Academy of management executive", 18[2], p. 114-120.
- [10] Aupperle, K .E., Hatfield, J. D. & Carroll, A .B., (1983), "Instrument Development And Application In Corporate Social Responsibility Academy Of Management Proceedings" , p. 369-373.
- [11] Aupperle, K .E., Hatfield , J. D & Carroll, A .B., (1985), "An Empirical Examination Of The Relationship Between Corporate Social Responsibility And Profitability", Academy of Management Journal, 28 [2], p. 446-463.
- [12] Aupperle et al., 1985
- [13] <http://online.wsj.com/article/SB10001424052748703338004575230112664504890.html?mod=ITP_thejournalreport_0>
- [14] <Fig 1.2:http://en.wikipedia.org/wiki/File:CSR_framework_-_value1.jpg>
- [15] <<http://www.cclfi.org/files/5CSR%20In%20Philippine%20Conglomerates%20TXT.pdf>>
- [16] <<http://EzineArticles.com/1212688>>
- [17] <<http://www.jpelectricinfra.com/index.php?action=read&id=3>>
- [18] <<http://www.jpelectricinfra.com/index.php?action=read&id=3>>
- [19] <http://en.wikipedia.org/wiki/corporate_social_responsibility>
- [20] <www.google.co.in>

Auction Agents

These MAs can bid for and sell items in an online auction on behalf of their owners. Each MA carries with it information about its owners bidding range, time within which the item is to be procured, bidding pattern, and other relevant attributes. In the presence of multiple auction houses MAs can be used for collecting information across them. An agent can make a decision to migrate to one of them dynamically, depending on the amount of information transmitted, latency etc.

Some advantages of using Mobile Agents include allowing disconnected operation of auction agents, reducing network traffic and, facilitating quicker response during auction. One example of a system that implements Mobile agents is Nomad.

DIFFERENT USES OF MOBILE AGENTS IN E-COMMERCE

User Sends Mobile Agents

The user has a PDA with which he can periodically connect to the network for a relatively short time. He wants to organize a complete holiday trip, including flight reservation, hotel booking, car rental, day trip arrangements, etc. For each of these different parts of his holiday, he sends a customized Mobile agent to the network that will find the best bargains. Obviously, the Agents will have to exchange information to be able to jointly organize the Holiday according to the overall requirements of the user. After the agents are sent to the network, the user disconnects his PDA from the network. There is also a semi-trusted platform which keeps track of the different mobile agents. This platform is given (public) information needed during the signature generation process. This platform can be administered by the user or by a service provider.

Agents Travel and Securely Collect Data

The mobile agents travel securely from agent platform to platform. Only the agent parameters and collected data are securely transferred between the agent platforms, the actual program code of the agent is retrieved each time from its original location (e.g., the semi-trusted platform or an agent code provider). We assume the code is generic and can be used by many customers. The agent parameters constitute the personalization and customization of the code.

The mobile agents will collect offers and other information at each agent platform.

Agents Conduct a Secure Payment Transaction

At some point in time, an agent will decide or need to conduct a financial transaction. It will then ask the cooperation of the other agents in order to generate a digital signature. Together they can generate a new signature on (for example) a particular offer of an agent platform. A combining entity is required to combine an appropriate set of the contributions of the agents into the resulting signature. In particular, to select this set, the validity of each contribution should be checked. This task can be performed by the semi-trusted platform that keeps track of the mobile agents or by another semi-trusted platform dedicated to handling agent transactions.

Verify Collected Data

At the end of its journey, the agent will return to the semi-trusted platform. This platform can verify the authenticity of the collected data. The data possibly includes transactions conducted by this agent. When the user reconnects his PDA to the network, he can request the status of his mobile agents and retract the returned agents from the network.

He can then disconnect again and interpret the collected data of the agents.

CONCLUSION

There is a strong case for the use of mobile agents in many Internet applications. Moreover, there is a clear evolutionary path that will take us from current technology to widespread use of mobile code and agents within the next few years. Once several technical challenges have been met, and a few pioneering sites install mobile-agent technology, use of mobile agents will expand rapidly.

REFERENCES

- [BKR99] Jonathan Bredin, David Kotz, and Daniela Rus. Economic markets as a means of open mobile-agent systems. In Proceedings of the Workshop "Mobile Agents in the Context of Competition and Cooperation (MAC3)" at Autonomous Agents '99, pages 43–49, May 1999.
- [DR99] Amitava Dutta-Roy. Bringing home the Internet. *IEEE Spectrum*, 36(3): 32–38, March 1999.
- [Gr99] Corey Grice. When will data change the wireless world? *CNET NEWS.COM*, February 10, 1999.
- [LO99] Danny B. Lange and Mitsuru Oshima. Seven good reasons for mobile agents. *Communications of the ACM*, 42(3): 88–89, March 1999.
- [MBB'98] D. Milošević, M. Breugst, I. Busse, J. Campbell, S. Covaci, B. Friedman, K. Kosaka, D. Lange, K. Ono, M. Oshima, C. Tham, S. Viridhagriswaran, and J. White. MASIF: The OMG Mobile Agent System Interoperability Facility. In Proceedings of the Second International Workshop on Mobile Agents, volume 1477 of Lecture Notes in Computer Science, pages 50–67, Stuttgart, Germany, September 1998. Springer-Verlag.
- [MMBC97] G. Muller, B. Moura, F. Bellard, and C. Conseil. Harissa: A flexible and efficient Java environment mixing bytecode and compiled code. In Proceedings of the Third Conference on Object-Oriented Technologies and Systems, pages 1–20, 1997.
- [Sch99] Seth Schiesel. Nortel plans new product to bolster optical networks. *The New York Times*, May 9, 1999.

Banking Sector Reforms in the Past Decade: Indian Experience

Jyoti Paul

Assistant Professor, Dyal Singh College, University of Delhi

Abstract—The banking industry in its current form has evolved from the era of Vedic period. Since that period, the banking sector has undergone significant changes in its structure followed by series of reforms. The resilience that we witness today in the sector is primarily due to the reforms. Capital adequacy norms, financial inclusion and prudential norms in respect of income recognition and asset qualification to name a few have entailed greater competition and at the same time helped the industry to manage the risks in a better manner. A series of reforms since 1991, and more recently in the last decade have made a strong line of defence for Banks against risks. However, even after adapting these reforms, there needs to be more resilience to face and emerge unscathed from any financial crisis. Given the focus on inclusive growth, banks are also expected to renew efforts to broaden the scope of financial inclusion and use viable business models to achieve their targets. Sustained pursuit of forward looking strategies aimed at mitigating risks, diversifying revenue sources, containing asset-liability mismatches, providing effective response to changing global market environment and improving customer relationships should strengthen the overall growth of the banking sector.

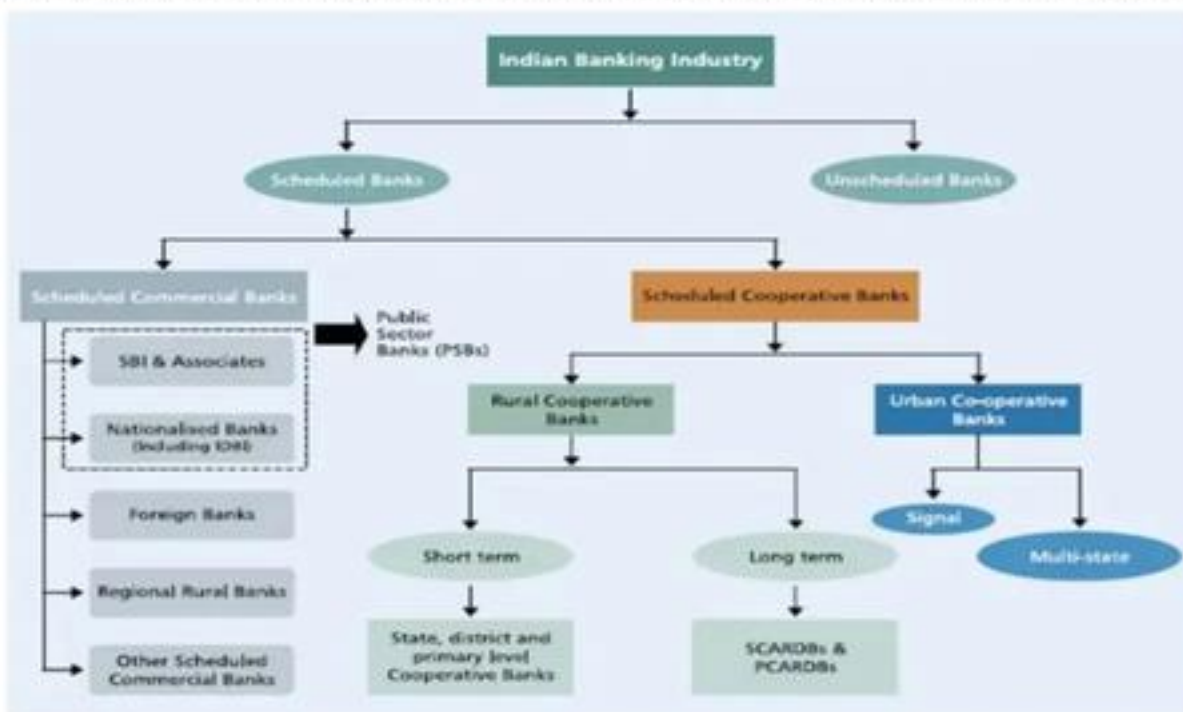
Keywords: Banking reforms, Deregulation, Financial Inclusion, Basel II, Corporate Governance

INTRODUCTION

The banking industry in its current structure has evolved from the era of Vedic period. Since that period, the banking sector has undergone significant changes in its structure followed by series of reforms. The resilience that we witness today in the sector is primarily due to the reforms. Capital adequacy norms, financial inclusion and prudential norms in respect of income recognition and asset qualification to name a few have entailed greater competition and at the same time helped the industry to manage the risks in a better manner. This paper makes an attempt to elaborate the reforms in the Banking sector, particularly emphasizing on the reforms in the last decade.

CURRENT STRUCTURE OF BANKING INDUSTRY

The Indian banking industry has a diverse structure. The present structure of the Indian banking industry (as shown in Exhibit 1) has been analyzed on the basis of its organised status, business as well as product segmentation. The entire organised banking system comprises of scheduled and non-scheduled banks. Largely, this segment comprises of the scheduled banks, with the unscheduled ones forming a very small component. Banking needs of the financially excluded population is catered to by other unorganised entities distinct from banks, such as, moneylenders and indigenous bankers.



Source: DBS Industry Research Service

Exhibit 1: Structure of Organised Banking Industry

Post 1991 Banking sector reforms

Banking reforms were made an integral part of the liberalization process. The financial sector reforms started in 1991 had provided the necessary platform for the banking sector to operate on the basis of operational flexibility and functional autonomy enhancing productivity, efficiency and profitability. While several committees have gone in to the problems of commercial banking in India, the two most important of them are-

1. Narasimham Committee I (1991).
2. Narasimham Committee II (1998).

The Narasimham Committee Report I aimed at bringing about "operational flexibility" and functional autonomy". The Narasimham Committee Report II focused on bringing structural changes so as to strengthen the banking system to make it more stable. Recommendations include strengthening banks, capital adequacy norms, entry of foreign banks, NPAs, autonomy in banking to name a few. These two Committee recommendations are the backbone of reforms in the banking industry in India. The process of reforms that was initiated by Narasimham Committee reforms in 1991 and further strenghtend in 1998 is still being carried forward.

RECENT REFORMS IN BANKING SECTOR

The last decade has seen many positive developments in the Indian banking sector. The policy makers, which comprise the Reserve Bank of India (RBI), Ministry of Finance and related government and financial sector regulatory entities, have made several notable efforts to improve regulation in the sector. Some of the measures undertaken recently in this regard are as follows

DEREGULATION OF INTEREST RATES

The most important and far reaching impact of banking liberalization in India has been the deregulation of the interest rate. The Indian banks are now adopting a completely market driven interest rate structure which was in earlier a govt. driven interest rate structure. The interest rate deregulation has resulted in the integration of the lending rates across spectrum. The motive behind the liberalization of interest rates in the banking system was to allow the banks more flexibility and encourage competition. Banks can charge rates according to their cost of funds and to reflect the creditworthiness of different borrowers.

Recently announced deregulation of savings bank account deposit on October 25, 2011 is a welcome move. The RBI has stated the savings interest rate deregulation is subject to the condition that each bank will offer a uniform interest rate on savings bank deposits up to Rs 1 lakh. Above this limit, banks may provide differential interest rates. However, there should not be any discrimination between customers on interest rates for similar deposit amounts. This means a bank will have to pay the same rate of interest regardless of whether the savings account has Rs 1,000 or Rs 1 lakh but that interest rate can differ from one bank to another. However, any unhealthy competition, arising out of deregulation may have the potential to create asset liability mismatches as some banks with large dependence on savings deposits for financing long-term assets may lose savings deposits to some other banks.

CAPITAL ADEQUACY NORMS

The Basel Committee on Banking Supervision had published the first Basel Capital Accord (popularly called as Basel I framework) in July, 1988 prescribing minimum capital adequacy requirements in banks for maintaining the soundness and stability of the International Banking System and to diminish existing source of competitive inequality among international banks. CRAR framework, as advocated by Basel Accord, has been adopted by most of the regulatory authorities as the basis of measurement of capital adequacy, which takes into account the element of risk associated with various types of assets reflected in the balance sheet as well as in respect of off-balance sheet items and the level of capital held by the banks. RBI introduced a minimum CRAR of 8% in 1992, for the commercial banks based on the recommendations of the Committee on Financial Sector Reforms (Narsimham Committee I), in a phased manner.

In India, RBI has implemented the Basel II standardized norms on 31 March 2009 and is moving to internal ratings in credit and AMA norms for operational risks in banks.

Existing RBI norms for banks in India (as of September 2010): Common equity (inclusive of buffer): 3.6% (Buffer Basel 2 requirements are zero.);

Tier 1 requirement: 6%.

Total Capital: 9 % of risk weighted assets.

The policy approach to Basel II in India is to conform to best international standards and in the process emphasis is on harmonization with the international best practices. Though the Basel II framework provides various options for implementation, banks in India will initially adopt the Standardised Approach (SA) for credit risk and the Basic Indicator Approach (BIA) for operational risk. The prime considerations while deciding on the likely approach included the cost of implementation and the cost of compliance.

PROVISIONING OF NPAs

NPA is an advance where payment of interest or repayment of installments of principal (in case Term Loans) or both remains unpaid for a period of two quarters or more. An amount under any of the credit facilities is to be treated as "past due" when it remains unpaid for thirty days beyond due date for two quarters since March 1995. Based on the status of the asset, an asset is classified on to four categories- standard, sub-standard, doubtful and loss asset. The concept of past due in the identification of NPA was dispensed with from March 2001 and the 90 days delinquency norm was adopted for the classification of NPAs with effect from March 2004.

Depending upon the asset classification, banks are to make provisions against NPAs as- 100 percent for loss assets; 100 percent for the unsecured portion plus 20 to 30 percent of the secured portion depending on the period for which the account has remained in doubtful category and general provision of 10 percent on the outstanding balance in respect of sub-standard assets from March 2000. Commercial banks are also asked to make provision @ 0.25 percent on their standard advances from year ending March 31, 2000. Banks are also required to create provisions on govt. guaranteed NPAs from first April 2000.

Further liberalizing the prudential norms for the treatment of non-performing assets in the context of ongoing slowdown in the Indian economy, RBI said all accounts which were standard accounts on September 1, 2008 would be treated as standard accounts on restructuring provided the restructuring is taken up on or before January 31, 2009 and the restructuring package is put in place within a period of 120 days from the date of taking up the restructuring package. The period for implementing the restructuring package has also been extended from 90 days to 120 days in respect of those accounts. The special regulatory treatment will also be available to 'standard' and 'sub-standard' accounts. These provisions would be in addition to the usual provisions as per the current regulation.

INCLUSIVE GROWTH

RBI has set up a commission (Khan Commission) in 2004 to look into financial inclusion and the recommendations of the commission were incorporated into the mid-term review of the policy (2005–06). In the report RBI exhorted the banks with a view of achieving greater financial inclusion to make available a basic "no-frills" banking account. In January 2006, the Reserve Bank permitted commercial banks to make use of the services of non-governmental organizations (NGOs/SHGs), micro-finance institutions and other civil society organizations as intermediaries for providing financial and banking services. These intermediaries could be used as business facilitators (BF) or business correspondents (BC) by commercial banks. The bank asked the commercial banks in different regions to start a 100% financial inclusion campaign on a pilot basis. As a result of the campaign states or U.T.s like Puducherry, Himachal Pradesh and Kerala have announced 100% financial inclusion in all their districts. "Swabhimaan" launched in February, 2011 is a path-breaking initiative by the Government and the Indian Banks' Association to cover economic distance between rural and urban India.

CORPORATE GOVERNANCE IN BANKS

Banking as a sector has been unique and the interests of other stake holders appear more important to it than in the case of non-banking and non-finance organisations. In the case of banking, the risk involved for depositors and the possibility of contagion assumes greater importance than that of consumers of manufactured products. Further, the involvement of government is discernibly higher in banks due to importance of stability of financial system and the larger interests of the public.

Role of Government as Regulator

RBI's approach to regulation in recent times has some features that would enhance the need for and usefulness of good corporate governance in the co-operative sector. The transparency aspect has been emphasised by expanding the coverage of information and timeliness of such information and analytical content. Banks have therefore been asked to publish the minimum and maximum interest rates charged by them and display this information in every branch. Disclosure and transparency are thus key pillars of a corporate governance framework because they provide all the stakeholders with the information necessary to judge whether their interests are being taken care of.

The commercial banks in India are now required to disclose accounting ratios relating to operating profit, return on assets, business per employee, NPAs, etc. as also maturity profile of loans, advances, investments, borrowings and deposits. Auditors are therefore expected to be well-versed with all aspects of the new guidelines issued by RBI and ensure that the profit & loss account and balance sheet of cooperative banks are prepared in a transparent manner and reflect the true state of affairs.

Board of Directors and their Committees

At the initiative of the RBI, a consultative group, headed by Dr. Ashok Ganguli was set up to review the supervisory role of Board of banks. It was unanimously accepted that the most crucial aspect of corporate governance is that the

organisation has a professional board. Important recommendations on the constitution of the Board are qualification and other eligibility criteria for appointment of non-executive directors, defining role and responsibilities of directors, training the directors and keeping them abreast of the latest developments.

Measures Taken by Banks

Prudential norms in terms of income recognition, asset classification, and capital adequacy have been well assimilated by the Indian banking system.

Measures Taken by RBI towards CG

Reserve Bank of India has taken various steps furthering corporate governance in the Indian Banking System. These can broadly be classified into the following three categories: a) Transparency b) Off-site surveillance c) Prompt corrective action.

RESTRUCTURING OF WEAK BANKS

The Committee on Banking Sector Reforms (CBSR) had recommended that a weak bank would be one (a) where accumulated losses and net NPAs exceed the net worth of the bank or (b) one whose operating profits less the income on recapitalisation bonds has been negative for three consecutive years. To identify a bank's weakness or strength with a fair degree of certainty, the Group has recommended the use of seven parameters like capital adequacy ratio, net interest margin etc. All the public sector banks were evaluated on these parameters keeping the median as the threshold in five of the parameters. For capital adequacy ratio, the threshold was 8 per cent and in respect of the coverage ratio it was kept at 0.50 per cent. Bank restructuring has been attempted mainly by using one or more of the following modalities: merger or closure, change in ownership, narrow banking and a comprehensive operational and financial restructuring. The Working Group has examined the applicability of each of the above options in the present Indian context.

ENTRY OF NEW BANKS IN THE PRIVATE SECTOR

Revised guidelines were issued in January 2001 for entry of new banks in private sector. The main requirements are regarding initial minimum paid-up capital of Rs. 200 crore to be raised to Rs. 300 crore (promoters to bring 40% while augmenting capital) within three years of commencement of business. Promoters' contribution shall be a minimum of 40 per cent of the paid-up capital of the bank at any point of time to be locked in for 5 years from the date of licensing of the bank and excess stake above 40 per cent shall be diluted after one year of bank's operations. NRI participation in the primary equity of the new bank shall be to the maximum extent of 40 per cent. Further no large industrial house can promote a new bank. Individual companies connected with large industrial houses can, however, contribute up to 10 per cent of the equity of a new bank. NBFCs with good track record can become banks, subject to specified criteria. A minimum capital adequacy ratio of 10 per cent shall be maintained on a continuous basis from commencement of operations.

SETTING UP OF DRT

One of the main factors responsible for mounting non-performing assets (NPAs) in the financial sector has been the inability of banks/FIs to enforce the security held by them on loans gone sour. Prior to the passage of the DRT Act, the only recourse available to banks or FIs was to cover their dues from recalcitrant borrowers, when all else failed, was to file a suit in a civil court. The result was that by the late '80s, banks had a huge portfolio of accounts where cases were pending in civil courts. It was quite common for cases to drag on interminably.

However, DRTs soon ran into rough weather. Thus, legal infrastructure for the recovery of non-performing loans still does not exist. The functioning of debt recovery tribunals has been hampered considerably by litigation in various high courts. So, the only solution to the problem of high NPAs is ruthless provisioning.

The recent amendment to the DRT Act addresses many of the lacunae in the original act. It empowers DRTs to attach the property on the borrower filing a complaint of default. It also empowers the presiding officer to execute the decree of the official receiver based on the certificate issued by the DRT. Transfer of cases from one DRT to another has also been made easier. More recently, the Supreme Court has ruled that the DRT Act will take precedence over the Companies Act in the recovery of debt, putting to rest all doubts on that score.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

A series of reforms since 1991, and more recently in the last decade have made a strong line of defense for Banks against risks. Deregulation, provisioning of NPA, disclosure norms, recapitalization have strengthened the banking sector to a great extent. However, even after adapting these reforms, there needs to be more resilience to face and emerge unscathed from any financial crisis. A new BASEL accord, Basel III is on the way to empower banks further by having counter-cyclical capital buffers and higher liquidity standards to minimize the contagious effect of failure of Banks to the entire financial sector.

Given the focus on inclusive growth, banks are also expected to renew efforts to broaden the scope of financial inclusion and use viable business models to achieve their targets. Finally, sustained pursuit of forward looking strategies aimed at mitigating risks, diversifying revenue sources, containing asset-liability mismatches, providing effective response to changing global market environment and improving customer relationships should strengthen the overall growth of the banking sector.

REFERENCES

- [1] Arun, T. G., and Turner, J. D., (2002a), "Financial liberalisation in India", *Journal of International Banking Regulation*, 4 (2), pp. 183-188.
- [2] Bhattacharya, Prabir C. and Sivasubramanian, M. N., (2001), "Aspects of Banking Sector Reforms in India", *Economic and Political Weekly*, Vol. 36(43), pp. 4151-4156.
- [3] Chakrabarti, Rajesh "Banking in India - Reforms and Reorganization" available at [ssrn-id 649855.pdf](#)
- [4] Ray, Jadhav Narendra, Partha Bose, Dhritidyuti and Sen Gupta, Indranil (2005), "Financial Sector Reforms and the Balance Sheet of the RBI", *Economic and Political Weekly*, Vol. 40(12), Money, Banking and Finance, pp. 1142-1143+1145-1150.
- [5] Joshi, P. N. (1999), "Banking Sector Reforms: The Other Side of the Coin", *Economic and Political Weekly*, Vol. 34(14), pp. 797-798.
- [6] Mohan, Rakesh, (2005), 'Financial Sector Reforms in India- Policies and Performance Analysis', *Economic and Political Weekly*, March 19, p 1118.
- [7] Mujumdar, N. A., (1998), "Banking Sector Reforms: Second Coming", *Economic and Political Weekly*, Vol. 33, No. 47/48, pp. 2954-2957.
- [8] Nagaraj, R., (1997), "What Has Happened since 1991? Assessment of India's Economic Reforms", *Economic and Political Weekly*, Vol. 32, No. 44/45, pp. 2869-2879.
- [9] Reddy, Y.V., (2002b), "Public Sector Banks and the Governance Challenge: Indian Experience", in: *RBI Bulletin*, May, pp. 337-356.
- [10] Sen, Sunanda and Ghosh, Soumya Kanti (2005), "Basel Norms, Indian Banking Sector and Impact on Credit to SMEs and the Poor", *Economic and Political Weekly*, Vol. 40(12), pp. 1167-1170+1172-1178+1180
- [11] <http://www.adb.org/documents/books/rising_to_the_challenge/india/india_bnk.pdf>
- [12] <<http://www.allbankingsolutions.com/banksyst.htm>>
- [13] <http://articles.economicstimes.indiatimes.com/2011-11-13/news/30394070_1_savings-bank-savings-account-interest-rates>
- [14] http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=12184
- [15] <http://www.commodityonline.com/news/Swabhimaan-Indias-unique-financial-inclusion-initiative-37812-3-1.html>
- [16] <http://ssrn.com/abstract=1089020>
- [17] www.rbi.org.in

Theory of Survival of the Fittest—A Prospective from Corporate Culture

A. Lakshmana Rao

Asst. Professor, University of Petroleum and Energy Studies, Dehradun

Abstract—Organizations may change, individuals may change, but one element is immortal i.e., "culture". The term passes through individuals and organizations since time immemorial. The impact of this single word is uncountable. What made this word so strong? What made this term to realize organizations or individuals for their success or failure? Organizations or individuals are dared enough to deviate from it? These key points are discussed in the elementary session of the present paper. There is an old theory of Darwin called survival of the fittest. The present paper takes its roots once again to culture. The paper takes to coin governance with culture, which ensures the existence of any system. Bad or weak governance is generally wiped out, in the same way weak cultures are difficult to survive. The paper in its approach used primarily three variables individuals, groups and organizations for governing culture. These variables are labeled and concluded as reasons for the failure or survival of the system of good governance culture.

Keywords: Survival, Governance, Success and Failure

INTRODUCTION

It is difficult to define culture. Basically culture is viewed as a cognitive framework consisting of attitudes, values, behavioural norms, and expectations shared by organization members; a set of basic assumptions shared by members of an organization. Schein, E.H.(1992).

The word culture is defined by scholars in wide variety of ways. Culture that may be of an individual, organization or society has its genesis on shared values and beliefs. Accordingly, culture could not be created all of sudden. For its occurrence, there must be a common platform or ideology among the members of the society. The platform can be considered as a discussion forum for exchange of thoughts for the origination of culture.

Chatman and Jehn (1994) shown that innovation, stability, orientation towards people, result orientation, easygoingness, attention to detail and collaborative orientation are the major elements of any organization culture.

If deduce further, culture is a vast term. It encompasses the whole gamut of environment i.e. legal, political and economic. It can emanate not only from these sources; it can be from symbols, slogans, stories, Jargons, ceremonies and principles of governance as well.

PROBLEM STATEMENT

A question that will emerge to anyone is how these philosophical and other thoughts endowed culture for generations together? The answer is "survival of fittest". What does it mean?

Survival of the fittest from a conceptual backdrop would mean that the elements, which are competitive, will thrive and the rest will be phased out. The same can be coined to culture as well. But, problem is not with the culture, it is with its governance.

RESEARCH METHODOLOGY

The present paper is majorly based on secondary sources like text books, journal articles and web sources and primary sources like simple random survey through a structured questionnaire. The study made its attempts to test the validity and reliability in its form. Appropriate figures and models are referred to justify the framework and concepts.

The reliability and validity these sources cannot be assured as most of the variables used for study are of high volatile and varied nature. Therefore, it is majorly intended for further research.

REVIEW OF LITERATURE

Porter et al. (1975) identified culture as the "set of customs, beliefs, and values".

William G. Ouchi (1981) analysed culture from three angles viz. US firms, Japanese firms and type Z US firms. He developed seven points for the comparison of these firms. They are 1) commitment to employees, 2) evaluation, 3) careers, 4) control, 5) decision making, 6) responsibility, and 7) concern for people.

Udai Pareek (2005) has given eight elements like openness, confrontation, trust, authenticity, proactivity, autonomy, collaboration and experimentation. These are referred as eight values responsible for making culture of an organization as strong or weak.

Kotter (1995) has formulated a step model for initiating a culture change.

Hofstede (2001) conducted a study on the employees across different countries with an objective of finding similarities and differences across different national cultures.

Edgar Schein (1985) displayed that leaders play a pivotal role in shaping, reinforcing and transmitting organizational culture.

C.L. Bansal (2005) discussed that Corporate Governance the key to sustainable wealth creation.

ICSI (Institute of Company Secretaries of India) (2008) opined that good governance demands a strong and creative leadership by the board of directors.

SOURCES OF CORPORATE CULTURE

There are wide varieties of sources for corporate culture. Culture initially originates with individuals by sharing together basic attitudes, values, and expectations. In the case of corporate culture the founders or leaders generate their culture and try to instill in group and consequently in the organization in a phased manner.

The modern sources of corporate culture emanate from different sources. They are individual, group, organizational and society. A key point to note is that, all these sources have a thick interconnection and are dependent on one another.

The following corporate culture model explains the sources and makes it clear the concept of corporate culture.



Fig. 1: Foundations of Culture

The general framework of culture model is that individual culture is dependent on group culture, which in turn is dependent on individual and group culture both. These in turn are dependent on organizational culture, which is all these in turn dependent on both individual and group culture.

An individual, when enters into a new group or organization brings not only his/her personality but also their beliefs, thoughts, values, customs and practices etc., and they strive to preserve those elements as long as these are not in contradiction of group or organizational beliefs, thoughts, values, customs and practices etc.. But, in reality it is not possible to keep one's beliefs, thoughts, values, customs and practices without contradiction. They may change or transform to a new set of things. This phenomenon in modern corporate terminology is called as "Socialization".

In fact, socialization is a change management process. It is used mainly to adjust an individual in a new set up or new culture. It is intended not only to adjust an individual to new culture but it has to take up the strong culture of the new entrant as well. Here, it is given a new look to the socialization model (See Fig.2).



Fig. 2: Basic Socialization Process

The above socialization process in addition to early researches, takes a new dimension on Organizational Learning. The process of organizational learning happens with the arrival of a new incumbent. Good governance can be learnt with the help of new individuals or groups. Most of the organizations have to adopt the above methodology in addition to simply socializing a new incumbent from their traditional focus. The above model instills new governance culture in corporate organization. With this new model organizational building can be enriched with the help of new insights from the new incumbent. In fact, it is a give and take policy and philosophy.

The modern HR should concentrate not only on equipping a new entrant to the existing culture, but it should learn and incorporate the positive and good culture of the new entrant to the organization. It is in a sense, a move towards creativity and innovation in organizational learning.

CORPORATE CULTURE: STRONG OR WEAK

Strong Culture exists when there is a widespread agreement with respect to the core elements of culture, making it possible for these factors to exert major influences on the way people behave. On the other hand Weak Culture has a limited agreement with respect to the core elements of culture, giving these factors little influence on the way people behave.

Table 1: Characteristics of Strong Culture

S No.	Characteristics of Strong Culture
1.	Clear Philosophy of the business
2.	Good Communication Channels
3.	Set of Shared Values held widely and deeply
4.	New employees are socialized carefully

DEVIATIONS FROM CORPORATE CULTURE

Culture evolves over a period of time and its existence generally cannot be questioned by anybody. The only remedy in case of difference regarding its unacceptability is its change through culture shift. Culture shift or deviation cannot be taken all of a sudden as there are evidences of culture shock. Culture shock can be witnessed by either individuals or organizations. Corporate Organizations undertakes socializations process for overcoming the problem of culture shock.

ROLE OF ETHICS IN CULTURE GOVERNANCE

Ethics prescribes the standards of conduct that guide behavior. A culture in order to be acceptable must be fair. Fair in its sense means must be ethical. However, corporate organizations have to take care of certain fundamental points with respect to ethical culture. They are:

- Ethics can be followed without jeopardizing the concept of profitability
- The activities, which are lawful must be ethical as well
- The decisions of all ie. Individuals, groups or organizations must result in ethical behaviour

The abovementioned points acts as a guiding norm for governing corporate culture.

ROLE OF INDIVIDUALS IN CORPORATE CULTURE

Individual is a human being, according to his choice only primarily organizations are built. However, due to the peculiar nature of the human, sometimes organizations have seen destruction as well. There a host of factors, which are responsible for building and governing corporate culture from an individual point of view. These factors are tabulated in table 2 as follows:

Table 2: Factors Influencing Individual Culture

S.No.	Factor
1.	Personality
2.	Attitudes
3.	Perception
4.	Values
5.	Ethics
6.	Capability of Learning
7.	Leadership
8.	Communication
9.	Influence on others

The magnitude of these factors varies from person to person. An individual potential on all these fronts brings and inculcates good governance culture in the system.

ROLE OF GROUPS IN CULTURE GOVERNANCE

Fundamentally groups exist in a society or organization. As per Organizational Behavioural Model, there is a great amount of influence on the part of groups by the individual behavior vis a vis group behavior on individuals. Accordingly whatever individual factors influence a good governance culture equally applicable to groups as well. However, groups have certain unique factors, which one cannot ignore. Some of these factors apart from individual factors on culture governance are tabulated in table 3 as follows:

Table 3: Factors Influencing Group Culture

S.No.	Factors
1.	Conflict
2.	Cooperation & Team Building
3.	Leadership & Power
4.	Motivation
5.	Organizational Development
6.	Career Planning
7.	Job Satisfaction

The abovementioned factors overlaps with individual behavior. The research of Herzberg on motivation revealed the fact that both individuals and groups have a commendable influence on one another. The influence can be either positive or negative on governance of culture.

ROLE OF ORGANIZATIONS IN CULTURE GOVERNANCE

Culture governance at organizational level depends on majorly three interrelated elements. They are:

1. Law
2. Corporate Social Responsibility
3. Wealth Maximization

The thrust of any organization is to win the race. The race calls for competition among various units for maximizing their wealth. The corporate organizations, which succeed in this battle, will with stand their market share and market growth and the others will be phased out. However, winning this race is a challenging one from governance of culture point of view. Accordingly, organizations have to create a governance culture suiting to all its constituents and its requirements.

Some of the key guiding principles, which organizations have to keep in mind in building their wealth, are as follows:

- a. Build wealth at the expense of the competitors but not at the expense of its constituents
- b. Create wealth through ethical and fair means
- c. Be transparent and trustworthy to all constituents
- d. Never ignore the society for its contribution towards organizational growth

These key guide lines have to be instilled in true spirit in all its constituents in order to build a strong good governance culture.

If the constituents are not capable to adapt to these principles, corporate organizations have to educate rigorously the concerned parties for achieving and maximizing their wealth.

GOVERNANCE AS CULTURE

Culture is an intangible force and it plays various roles in corporate (See Fig.3). Some of its crucial roles in the process of governance are as follows:

1. Culture establishes a sense of identity;
2. Culture provides commitment to the Organization's Mission
3. Culture reinforces Standards of Behaviour

Governance of culture transforms individual, group and organizational culture coterminous with the corporate culture (See Fig.3).

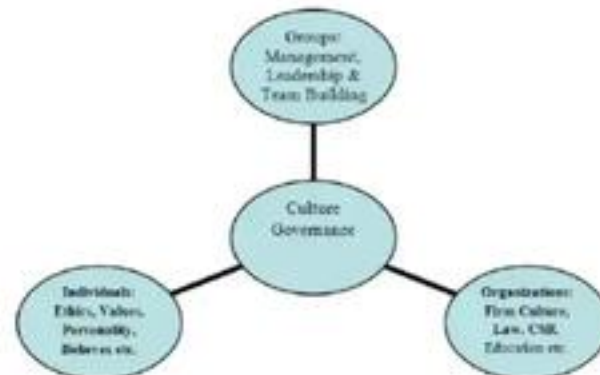


Fig. 3: A governance Model of Individual, Organizational and Societal Culture

Good governance is a Corporate Culture. Whereas bad governance is a bad corporate culture as it is distraction of organizational governance. The organizations will survive as long as they hold good individual, group and organizational governance in their system. The governance of all these three variables calls for governance of various other elements. There are lots of instances of organizational successes and failures majorly due to the flaws in their individual governance.

CORPORATE CULTURAL SURVIVAL

Culture is unique. Even though it is unique, there are problems for its survival. Certain corporate cultures survive and flourish because of their acceptability by all its constituents. Some of the corporate cultures and their acceptability by the subjects are listed below in table 4:

Table 4: Characteristics of Corporate Culture

Corporate Culture	Characteristics	Acceptability: Yes/No (Sample Size 100)
1. Bureaucratic Culture	Behaviour of employees is governed by rules and regulations, strict procedural formalities are prescribed, all the duties and responsibilities are clearly established.	No-90% Yes- 10%
2. Clan Culture	Behaviour of employees is guided by the tradition, loyalty and through socialization.	No- 60% Yes- 40%
3. Entrepreneurial Culture	Risk taking, dynamism and creativity plays crucial role.	No- 70% Yes-30%
4. Market Culture	Hard-driving competitiveness, profit orientation, high performance expectations with high rewards, independence and individuality in achieving organizational goals.	No- 10% Yes – 90%

Source: Author

The researcher formulated a small questionnaire consisting of four questions and administered the same to 100 respondents with Yes or No Type answers. The sample questions can be referred as variables. The questions are as follows:

- Are you interested in bureaucratic environment?
- Whether your behavior is willing to be guided and mould by somebody?
- Do you have risk taking and innovative skills?
- Do you accept merit based performance as a substitute for the above three questions?

The results revealed that constituents accept culture due to a wide variety of factors. The culture, which has some ground rules, ethics and with some value added benefits finds better place of acceptance.

Whatever may be the culture as long as it is accepted by the environment it will survive and becomes historical once finds no scope for its acceptance. It is on the part of the corporate organizations to find and draw a corporate culture life cycle for their corporate cultures.

However, the corporate organizations have to note the point that it is the individuals (employees) with strong work values and commitment makes the difference between successful corporate cultures from an unsuccessful one. Corporate organizations have to formulate cultures keeping in mind the constituent requirements, even though a new culture is utmost required for its very survival.

CORPORATE GOVERNANCE CULTURE SUCCESSES AND FAILURES EVIDENCES FROM ENVIRONMENT

There are a host of evidences available from corporate world with respect to corporate success stories and failures. Some of the failures are majorly due to bad governance cultures. There are lots of parties responsible for the same. On the other hand, there are lots of governance culture success stories as well. A list of these successes and failures are tabulated in table 5 as follows:

Table 5: Some Culture Governance Success and Failures

S. No.	Governance Culture Success/Failure	Remarks
1.	Enron – Failure	Bad ethical culture
2.	Paramalat – Failure	-do-
3.	Worldcom – Failure	Bad governance
4.	Tyco – Failure	Leader lacking culture
5.	Xerox – Failure	Corporate Governance Failure
6.	Satyam – Failure	Leader generated unethical practices
7.	Infosys- Success	Strong ethical culture
8.	NTPC – Success	Good Governance Practices
9.	ONGC – Success	-do-
10.	HPCL – Success	-do-

Source: Author

An Overview of Security Issues in Grid Computing

Santosh Kumar Singh¹, Ranjeet Kumar Singh² and Ganesh Gupta³

¹M.Tech (IT), Govt Engineering College, Ajmer

³Faculty, Amity University Haryana, Gurgaon

Abstract—Grid computing provides consistent, inexpensive access to computational resources (supercomputers, storage systems, data sources, instruments, and people) regardless of their physical location or access point. As such, The Grid provides a single, unified resource for solving large-scale compute and data intensive computing applications. The survey of distributed system security, with applications for the grid security infrastructure, begins with an overview of grid computing, security and grid security infrastructure (GSI). For user authentication, delegation and single sign-on, the OGSA (Open Grid Services Architecture) uses the GSI (Grid Security Infrastructure) protocol. The goal of this survey is to increase the awareness of security issues in Grid Computing.

Keywords: OGSA, Security, GSI

INTRODUCTION

Key issues for establishing a Grid infrastructure were identified, such as resource discovery, resource allocation, data management, security, accounting, monitoring, scalability, and fault tolerance. Security requirements are fundamental to the grid design. The basic security components within the Globus Toolkit provide the mechanisms for authentication, authorization, and confidentiality of communication between grid computers. Without this functionality, the integrity and confidentiality of the data processed within the grid would be at risk. To properly secure your grid environment, there are many different tools and technologies available. Grid security builds on well-known security standards.

SECURITY SERVICES

Security requires the three fundamental services: authentication, authorization, and encryption. A grid resource must be authenticated before any checks can be done as to whether or not any requested access or operation is allowed within the grid. Once the grid resources have been authenticated within the grid, the grid user can be granted certain rights to access a grid resource. This, however, does not prevent data in transit between grid resources from being captured, spoofed, or altered. The security service to insure that this does not happen is encryption. The Grid Security Infrastructure (GSI) of Globus and a Public Key Infrastructure (PKI) provide the technical framework (including protocols, services, and standards) to support grid computing with five security capabilities: user authentication, data confidentiality, data integrity, non-repudiation, and key management.

GRID SECURITY TERMS

Symmetric Encryption

Using the same secret key to provide encryption and Decryption of data.

Asymmetric Encryption

Using two different keys for encryption and Decryption. The public key encryption technique is the primary example of this Using a "public key" and a "private key" pair.

Secure Socket Layer/ Transport Layer Security (SSL/ TLS)

Essentially the same protocol, but are referred to one another differently. TLS has been renamed by the IETF, but they are based on the same RFC.

Public Key Infrastructure (PKI)

The different components, technologies, and protocols that make up a PKI environment.

Mutual Authentication

Instead of using an LDAP repository to hold the public key (PKI), two parties who want to communicate with one another use their public key stored in their digital certificate to authenticate with one another.

SECURITY ISSUES

The Grid security requirements can be grouped into several broad categories each with its own challenges. Delegation many different usage scenarios require one agent to act on behalf of a principal. The conventional approach when a user must ask a service to perform some operation on her behalf is to grant unlimited delegation, which is to unconditionally grant the service the ability to impersonate the user. While this is a reasonable approach in an environment in which all

The above cases have contrasting cultural and governance features. An organization with good principles and governance system will survive and the others will be phased out. This is the generally referred to as the (though not in reality) theory of Charles Darwin in 18th Century and still holds good even to contemporary management.

CONCLUSION

Organizations or individuals will survive if the governance works perfectly or in other sense “better”. If not it is not only the responsibility of the Organization but also of the individual and society to bring good governance for better survival of all entities.

“Neither culture nor organizations survive, if there is a failure of governance”.

REFERENCES

- [1] Chatman, J. A. and Jehn, K. A., (1994), “Assessing the relationship between industry characteristics and organizational culture: How different can you be?” *Academy of Management Journal*.
- [2] Mallin, A. C., (2007), *Corporate Governance Second Edition*, Oxford University Press.
- [3] Bansal, C. L., (2005), *Corporate Governance Law Practice & Procedures with Case Studies*, Taxmann’s Publications, pp. 358–375.
- [4] Schein, E. H. (1985), *Organizational Culture and Leadership*, Jossey-Boss, San Francisco, p.9.
- [5] Schein, E. (1992), *Organizational Culture and Leadership*, San Francisco, Jossey- Bass.
- [6] Hofstede, G. (2001), *Culture’s Consequences: Comparing Values, Behaviours, Institutions and Organizations*, London, Sage.
- [7] Geert Hofstede, “Cultural Constraints in Management Theories,” *Academy of Management Executive*, February 1993
- [8] Goffee, R. & Jones, G. (1996), “What holds the modern companies together?” *Harvard Business Review*, 74 (6), pp. 133–148.
- [9] Kotter, J. P. and Heskett J. L. (1992), *Corporate Culture and Performance*, New York, The Free Press.
- [10] Jerald Greenberg and Robert, A. Baron (2010), *Behaviour in Organizations*, PHI pp. 542–557.
- [11] Martin, J. (2005), *Organizational Culture*, CA:Sage
- [12] Porter et al. (1975), *Behaviour in Organizations*, McGraw Hill, New York.
- [13] Schein, E. (2004), *Organizational Culture and Leadership*, 3rd Edition, San Francisco: Jossey-Bass
- [14] Terpstra, V. “*International Marketing*”, 4th ed. The Dryden Press, 1987
- [15] Trice, H. & Beyer, J. (1993), *The Cultures of Work Organizations*, Englewood Cliffs, N. J. Prentice Hall of India
- [16] The Institute of Company Secretaries of India (2008) *Corporate Governance*, Taxmann.
- [17] Pareek, U., (2005), *Understanding Organizational Behaviour*, New Delhi, Oxford.
- [18] VSP Rao (2009), *Organizational Behaviour*, Excel Books, pp. 561–571
- [19] William, G. Ouchi (1981), *Theory Z*, Addison-Wesley, Reading, Mass.

RTI Revolution: A Yes Button to Unveil Information

Shivangi Singhal

Assistant Professor, MIT, Moradabad

Abstract—There are many problems facing India today; Poverty, lack of adequate facilities, health issues, women empowerment, and the like. But one of the biggest problems faced by the country is Corruption which is slowly and gradually uprooting India from the grounds of development in all the facets of the world. We talk about policies, programs, strategies, but until and unless it is not equipped with proper “implementation”, they cannot become fruitful. And, for this proper implementation, there must be proper accountability of various organizations where the “people” who are the makers of the government have the right to question and more importantly have the right to get ‘answered’. The introduction of the Right to Information Act was one of the major steps taken to empower the PEOPLE of India; being the most important element of any democracy. Here is an attempt to identify the various dimensions related to the implementation and power of the Act; what has been done and what still needs to be done in order that the dream of a corruption-free India can come true which will be helpful in Resurging it!

Keywords: Right to Information, Public Information Officer, Whistleblower, Public Distribution System

INTRODUCTION

The three fundamental pillars of democracy are: *Accountability; Transparency and Participation*. Without these components, democracy loses its essence and the real meaning of democracy vanishes. In order to implement ‘true democracy’, the real power should vest with the people. There must be enough “power in the people” that they can easily question the “people in the power” the accountability and transparency in their policies. Thus, there must be means for the people to “know” and be “informed” about the activities of any such organization which are directly or indirectly a concern for him. The Right to Information Act was one such means.

The Right to Information Act came into existence and became fully operational on the 12th October, 2005. This law satisfies the long standing demand of the people raised through various people’s movements and gives contents and meaning to the right to information recognized since 1973 by the Supreme Court as a concomitant of the fundamental right to freedom of speech and expression guaranteed under Article 19(1)(A)¹. Like many other acts, this act also applies to whole of India except the state of Jammu and Kashmir. A guaranteed right to get hold of government held information puts power back to where it belongs – with the people². Under the provisions of this Act, any citizen may request for information in any form including documents, records, memos, e-mails, etc. from a public authority and that authority has to reply expeditiously or within 30 days. There are certain exclusions to the RTI Act as well like disclosure of information which can cause a breach of any privilege of Parliament or State Legislature; information received in confidence from foreign government etc.

The Act is meant to provide for setting out the practical regime of right to information for citizens. The other countries took a longer time in the introduction and implementation of this kind of act whereas in India, it was not much longer and took only few months. So, the point here is that to implement something new, it needs to change the complete mindset, infrastructure, mechanisms; so that it can be well adopted and carried out.

STRENGTH OF THE RTI

The RTI Act because of its strength that it truly gives “democracy” its real meaning; is turning into a big step towards the welfare of the people; be it of any class or any section of the society. After the two revolutions – Green and the White, which were restricted to few areas; this third revolution encompasses the whole of the country. RTI has made life easier and honorable for common people as it empowers them the right to question the public authorities and get their official work done in time without the use of systematic corruption elements like bribe. Right to Information is a fundamental human right, crucial to human development, and a prerequisite for the realization of other human rights: civil and political rights such as the right to life and liberty, freedom of expression, and equality before the law; and economic, social and cultural rights such as right to adequate food, right to water, right to highest attainable standard of health, right to education³.

There is nearly no citizen in India who at one step or the other did not have to face the evil corruption. In government offices particularly, there is such huge amount of systematic corruption that one can not think about getting the requirement fulfilled in time without bribe. They hold the information with themselves so as to avoid the transparency and thus they can practice whatever they feel like while misguiding the people as they know little about their functioning. But the RTI is a way through. A statutory right to information would secure for every citizen the enforceable right to question, examine, audit, review and access government acts and decisions, to ensure that these are consistent with the principles of public interest and justice. It enhances the quality of citizen-participation in governance from mere vote-casting, to involvement in the decision making that affects his or her life⁴.

The RTI in the initial stage, when it was implemented only in Delhi, through mechanisms like the *Jan Sunwai* made good peace of success by bringing common man face to face with the authorities in order to fix responsibilities and elicit answers. These successes show, in the words of the man behind it: Arvind Kejriwal, “a switchover from representative democracy to participative democracy”.

Besides the request for government-held information, RTI also imposes *suo motu* or proactive disclosure in Section 4(1)(b) which is a positive obligation on public authorities to collect and publish specified details about their work. This mechanism is expected to force the authorities to keep the records in most genuine and trustworthy format because they have to provide it to the people whenever asked for. In this way, there would be very less chances of discrepancies.

INSTANCES

There have been a number of instances where, through the Right to Information, people have got the information on various issues and also, corrective measures were also taken to resolve their grievances. In the first year itself of the RTI, 42,876 applications of information were filed to Central public authorities.

- Mayank Agarwal, a second year student of management studies, filed an application for the work done by Municipal Corporation April 2003 to July 2004 in the area where he lives and thus identified financial discrepancies.
- Bhupesh Kumar, 21 year old student Bhupesh Kumar through filing an application in the Directorate of Education, found he had actually scored 54 percent marks in English, and not 23 out of 100 as his mark sheet declared.
- Sudesh Shukla got the possession of his flat when it was illegally given to someone else; by using RTIA.
- Eight year old Aishwarya wrote a three-point application to the public information officer (PIO) of the Chief Minister’s office seeking an answer to why the garbage is being dumped in front of her school⁵.
- Nine year old Pranav forced Delhi police to register a First Information Report (FIR) to trace his lost bicycle by filing an application under the RTI Act⁶.

470 year old Kaniram got his entitlements of food grain under Public Distribution System (PDS) that was denied to him for one year.

Not just this, there have been various instances where people “Below Poverty Line” were not given the essential grains and food items as per the PDS(Public Distribution System) which were stored in unauthorized manner and were illegally distributed elsewhere; but by filing application through RTI, they got what they deserved.

CHALLENGING ISSUES IN FRONT OF RTI

Although RTI is a very important and potential tool in changing the ongoing evil practices of corruption in various public organizations; there are certain issues which are crucial for the proper implementation and making the RTI Revolution more effective. There are issues of awareness among the seekers of information; complex procedures and cost involvement; security issues for the demanders of the information. All these need to be paid heed at for the fulfillment of objective of the RTI revolution. These are discussed in the coming section.

- The *changing organization’s information assets* i.e. the “Infostructure” is fast changing from the traditional document based or paper based to the new digitized form. Now, with this kind of system, both the information providers and the information seekers need to have knowledge about these systems so that the authorities cannot deny using one excuse or the other.
- One of the most important issues is the *awareness issues*. Still, a large number of people are unaware of their Right to Information. Majority of people don’t even know about such and act being passed as Kejriwal calls it “best kept secret” of the government.

Chart 1

As depicted in the figure above, the rural; female and the socially disadvantaged (i.e. the SC/ST/OBC) population know very less about the RTI.

- Another problem which comes to notice is the *lack of user guides* as provided under Section 26 of the RTI Act that these need to be distributed for information seekers. This step is not being taken by the appropriate governments earnestly. It is for the same reason that many people who seek for information under this act; due to lack of knowledge about further steps, leave it in between.
- Further, there are *constraints faced by the PIOs* (Public Information Officers) who are the suppliers of the information to people who seek it. The table depicts those issues:

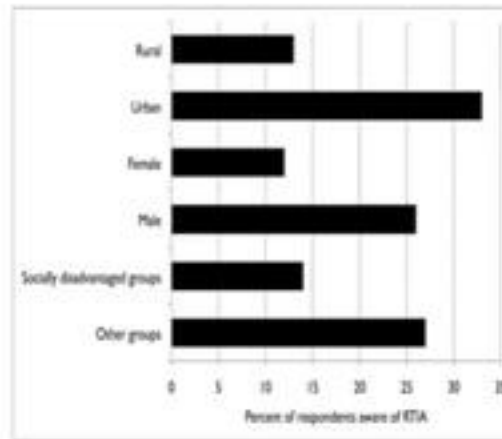


Fig. 1

Source: Price Waterhouse Coopers 2009, 38

Chart 2

- Besides this, the PIOs, due to *lack of training* and insufficient knowledge regarding the procedures, *do not assist* the information seekers properly; nor do they carry a polite or friendly attitude towards them.
- Even after so much advancements and use of technology in record keeping, there is still a *limited use of IT* which further weakens the various information transferring procedures. Also, there is no Centralized web-based database using which tasks could have been much easier.
- There must be a number of *innovations in the implementation* of the Act; as India is a land of diversities among people, there must be certain unique ways to develop this kind of structure which seems easy for every section of the society and those must be tailored according to them.
- The *cost constraints* related to the RTI Act is also a big challenge and it is a tough road ahead. The cost of seeking any information, for e.g. in Delhi, Rs 25 per application and Rs 5 per page of information, is quite high especially for a person of low income group.
- *Security of the information seeker* is a major problem and a matter of serious concern; there have been instances where people are forced to take their RTI application back and in some cases they are even attacked. There is still no measure of protecting these people from such evils.

If these constraints are not looked upon at, it will lead to an improper implementation making the RTI Act a mere extension of the Constitution; rather than being a People's Movement!

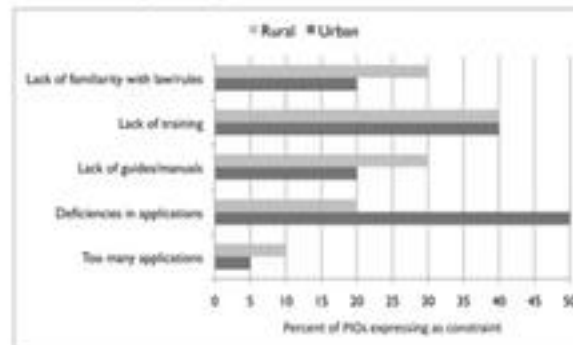


Fig. 2

Source: RTI Assessment and Analysis Group 2009, 23

SUGGESTIONS

To overcome the various problems in the effective implementation of the Act and get fruitful results of this information revolution; many dimensions need to be considered.

- First of all, there is strong need of awareness about the Right to Information not only for the people who are 'completely unaware' about it but also for the people who have filed the RTI requests so that they can proceed correctly. Right now, there are commercial advertisements for awareness about laws related to consumer's welfare like the Consumer Protection Act but very less for the RTI. So, the use of "mass media" can prove to be influential.

- Easy-to-understand user guides must be provided must be made available to the information seekers; as is provided by the Act itself. So that they do not face difficulties in acquiring relevant information, government should monitor the availability issues related with these user guides.
- People who have been helped through the RTI Act must guide the other people regarding the use of it as well and for the same, a kind of societies or forums can be developed where the people can share experiences and also the problems arising in the way of information seeking.
- Electronic media should be used more appropriately so that the awareness about the RTI can be widespread; plus the people can get answers through the FAQs regarding queries like who can use the RTI? How to file an RTI application? What kind of information is excluded from it? Etc.
- The RTI also requires openness within the official system; so as to bring a corruption-free and real democracy.
- RTI Act alone cannot 'protect' the information seekers; so it needs to be accompanied by other powerful acts too. Not only the information seekers but also the whistleblowers; people who exposes any wrongdoing, corruption, fraud or mismanagement. The RTI must be accompanied by the whistleblower's protection act.
- The government should take steps to check the costs associated with the availability of information documents to the demanders. As some of them may be belonging to the weaker section, provisions must be made for them for cheaper availability of records.
- Proper heed must be given to the training of the officials directly related with the information providing functions; like to PIO and Assistant PIO.
- Lastly, there must be provisions of penalties for the public officials who are caught red-handed. If during the process of seeking any information from any public authority, any discrepancies are found, then the same must be taken attention and the concerned must be penalized.

CONCLUSION

The RTI, indeed a powerful and effective tool to combat corruption, needs to be made more and more strong to strengthen the true democracy. According to the RTI, the final arbiter is the chief vigilance officer, when all the information has been obtained, so genuinely the question arises whether it has actually given the final right into the hands of the people or not? The loophole here is that the chief secretary would find it impossible to take action against a sitting politician or minister⁷.

RTI has a long way to go... Many loopholes need to be looked upon; proper rights to be given finally in the 'hands of the People'; along with 'protection' and also the proper structure for adaptation of the concepts in the ongoing system. On top of all, the 'awareness' issue is the most significant one because when some people don't even 'know' that RTI exists; it will take some time to make it a powerful weapon against corruption all over the nation.

The poor and the illiterate do not have the means to tackle a corrupt and arrogant bureaucracy, while tax paying middle class simply pays up or gives up in disgust; and the elite, with their deep pockets, continue to feed the system of corruption⁸. The information revolution is a major step but to make the RTI really "revolutionary"; there needs more to be done. It is a "Revolution in Progress" which has the potential of eradicating evil issues of corruption which is the root cause of slow development of India.

REFERENCES

- [1] Sathe S. P.,(2006), "Right to Information" Lexis Nexis Butterworths Wadhwa, Nagpur.
- [2] Nigam S. (2006). "Right to Information Law & Practice", JBA Publishers, Noida.
- [3] http://rti.gov.in/rticorner/studybypwc/key_issues.pdf
- [4] http://en.wikipedia.org/wiki/Right_to_Information_Act,_2005
- [5] <http://www.rtiindia.org/forum/forum.php>
- [6] Basu D.D., (2008) "The Constitutional Law of India," 8th Edn. Vol. 3, Lexis Nexis Butterworths Wadhwa, Nagpur.

Resurging India—The Real Picture

Seema Batra

Assistant Professor, Communication Skills & Personality Development, Shri Venkateshwara University, Gajraula

Abstract—India made a good start upon its independence. It opted for democracy as its system of governance. Much about India is transparent enough. One does not require detailed criteria, cunning calibration or probing analysis to pinpoint India's problems and recognize its antecedents. The intention of this paper is to put forth the realities which are ugly enough and hardly a thinking person of this country would disagree with me about the fact that the system is in a crying need of swift reform and radical change. India is a developing country with the second largest population in the world. But somewhere along the way India lost its eminence and glory. And, a deeper understanding and detailed presentation of its greatness remained to be attempted. The need is to re-discover and highlight the true and authentic picture of India's great achievements in every field of human activity, including science and technology, astronomy, mathematics, medicine, surgery, architecture, sculpture, art, music, dance, agriculture, polity and administration and Yoga and spirituality. The British ruled the country for 200 years during which time a lot of wealth was misused and even now there is a disproportionate distribution of funds. The fact, however, remains that an average Indian has a tough time making ends meet. In the recent past, several old myths about India have been shattered. But there are still lots of dark areas where reality sometimes presents a bleaker picture than the myths. Change and optimism is in the air as India has emerged as one of the fastest growing global economies. However, questions and concerns still remain. Poverty, inequality, child labor, illiteracy, educational system, female feticide, etc. are the areas of major concern. The evils of the caste system and discrimination against women and female infanticide still plague India.

Keywords: cunning calibration, probing analysis, antecedents, authentic, myths.

INTRODUCTION

India, today, is at the cross-roads. On the one hand, there is a feeling of anxiety and helplessness at the prevailing levels of corruption, violence, falsehood and deteriorating value systems. And yet, on the other, there is hope, even certitude, that India will regain its position as a significant contributor to mankind. India needs improvement in all spheres so that it could also be counted as the developed country. The intention of this paper is to gain an insight into the causes of India still being a developing country and finally, to draw inspiration from these insights, to work for a New, Vibrant and Resurgent India, that will go beyond its ancient achievements and play its true role in the world. The qualities that for centuries gave India its unparalleled eminence will not only have to be rediscovered and re-established but also to be taken to greater heights. For this a beginning has to be made by creating a greater awareness about these truths.

Why is India still a developing country and what is stopping it from being a developed country?

Poverty: "Indians are poor; but India is not poor"

It is commonly said that India is a place of poverty and desperation. It is ironic that India, once considered a land of milk and honey and fought over by various invaders over hundreds of years, is now perceived as a land gripped by poverty. India continues to be the home of the largest number of poor people in the world. It has the highest population of malnourished children. Its farmers are committing suicides at an alarming rate. The question arises— Why is India poor? These are probably often thought questions. Some people might answer "India is poor because it lacks infrastructure western countries have", or "India is poor because of lack of education among people", or "India is poor because it is corrupt and it has politicians who manipulate people etc. About 108 lakh crores Indian black money is deposited in Swiss Bank. This money is blocked by corrupt politicians and the so called rich people. It can be used for tax less budget for 25-30 years. It can give jobs to all Indians and can give free education to all Indians. How can India develop under such circumstances?

GENDER INEQUALITY

As soon as a child is born families and society begin the process of gendering. The birth of the son is celebrated, the birth of a daughter filled with pain; sons are showered with love, respect, better food and proper health care. Boys are encouraged to be tough and outgoing; girls are encouraged to be homebound and shy. All these differences are gender differences and they are created by society. Gender inequality is therefore a form of inequality which is distinct from other forms of economic and social inequalities. It dwells not only outside the household but also centrally within it. It stems not only from pre-existing differences in economic endowments between women and men but also from pre-existing gendered social norms and social perceptions. Gender inequality has adverse impact on development goals as it reduces economic growth. There are vast differences in education level of two sexes. India has witnessed gender inequality from its early history due to its socio-economic and religious practices that resulted in a wide gap between the position of men and women in the society.

The Constitution of India ensures gender equality in its preamble as a fundamental right. In spite of numerous policies and legislations, the reality of gender inequality in India is very complex and diversified. Men are always

preferred over women in the fields like education, employment opportunities, etc. It is surprising that in spite of so many laws, women still continue to live under stress and strain. To ensure equality of status for our women we still have miles to go.

CHILD LABOR IN INDIA

The problem of child labour is a major challenge to the progress of developing countries. Children work at the cost of their right to education which leaves them permanently trapped in the poverty cycle, sadly without the education and literacy required for better-paying jobs. This is particularly serious in India as it tops the list with the highest number of child labourers in the world. India has the highest number of laborers in the world less than 14 years of age. Although the Constitution of India guarantees free and compulsory education to children between the age of 6 to 14 and prohibits employment of children younger than 14 in any hazardous environment, child labour is prevalent in almost all informal sectors of the Indian economy.

Generally we talk about children that they are our future. We forget that they are our present too. The share of children in India's population is around 40%. How can we ignore them from the growth story of India? Our Constitution talks volumes about the right to education, right to food and right to shelter to all the children. But what about the fundamental rights of the children who go back to sleep empty stomach, who do not go to school because their parents cannot afford the cost, who are deprived of other basic necessities of life. Seventy five percent of Indian population still resides in rural areas and are very poor. Children in rural families who are ailing with poverty perceive their children as an income generating resource to supplement the family income. No doubt, government has taken several steps to protect and provide fundamental rights to children like Sarva Shiksha Abhiyan (SSA), Integrated Child Development Services (ICDS), etc. The problem is that people are still unaware of these schemes and their benefits.

EDUCATION SYSTEM OF INDIA

Education System in India currently represents a great paradox. On the one hand we have IIMs & IITs that rank among the best institutes in the world and on the other hand there are number of schools in the country that don't even have the basic infrastructure. Even after more than 60 years after independence we are far away from the goal of universal literacy. But on a positive note, Indian professionals are considered among the best in the world and are in great demand. This signifies the inherent strength of Indian education system. About 38% of doctors in America are Indians, 12 % of scientists in America are Indians, and 36% of NASA employees are Indians and 34% of Microsoft employees are Indians. Does all this data indicate in any way that Indians are less intelligent than others or for that matter lacking in educational qualifications than others? Of course not. Then have a look at the following data:

- The literacy rate of India as of 2009 is estimated to be 79.9%
- Of the entire world's illiterate people, 35% live in India.
- It is estimated that by the year 2020 over 50% of the illiterate population will live in India.
- Approximately 40% of students, mostly girls, drop out by secondary school
- Approximately 9 million children are not yet enrolled in schools.
- 52 percent of children aged 7 to 14 in rural India could not read a simple paragraph even after attending school.
- In India 40% of the people who commit suicide belong to the adolescent age group.

We need a revolution in the education system in India? Today we claim to be the biggest human resources supplier for the world, but are we concerned what quality of human capital we are building and for whose needs? We supply bureaucrats to the government, software engineers to the IT companies around the world, highly paid managers to the multinationals; we supply engineers and science graduates as researchers to the foreign universities. What capital are we building for ourselves?

When we talk about the system of education in India, it seems to have fallen in the hands of commercialization which is depriving the mass of students of their right to quality education. Merely ensuring high number of enrollments in schools won't make the children of India educated. Learning in school must be ensured and the quality of education should be measured in terms of children's learning. Employing more funds would not ensure better outcomes rather optimum utilization of available funds must be ensured. If the government does not improve education system particularly in rural areas the rich will become richer and the poor will get poorer. Hence, it is imperative for the government to correct the blemishes in India's education system which will also be a step towards reducing income inequality. Certain policy measures need to be taken by the government. The basic thrust of government education spending today must surely be to ensure that all children have access to government schools and to raise the quality of education in those schools.

WHAT STEPS SHOULD INDIA TAKE TO BECOME A TRULY RESURGENT NATION?

- The Indian economy is making rapid progress. Continuation of the same trend in the coming years should result in substantial advancement in prosperity as compared to developed countries. I would like to suggest the

following areas of improvement for the development of India's economic prosperity and security. India's achievement in the field of information technology, particularly in software development has been very impressive and very much talked about. But it is worth noting that most of India's software and other IT services companies, including IT based business process outsourcing derive a very big chunk of their business from overseas business. This means that India is not able to make much use of IT to improve the effectiveness and efficiency of its business and other economic operations. This also reflects the low priority given by Indian business to improve quality, effectiveness and efficiency. I believe that to become a major economic power in the world, it is necessary to develop the best capabilities in much wider sphere of technology, rather than just providing services to other companies and business that use such services to achieve high level of efficiency and effectiveness.

- There is a need to cut down on corruption and inefficiency in the government. There are many myths about corruption, which have to be exploded if we really want to combat it. Some of these myths are: Corruption is a way of life and nothing can be done about it. Only people from underdeveloped or developing countries are prone to corruption. We will have to guard against all these crude fallacies while planning measures to fight corruption. If we do not take step forward to remove corruption from root, the word developing country will always be attached with our country.
- People should adopt family planning programmes to reduce the population of the country.
- Better education and medical facilities should be provided. Literacy can remove all the social evils from the country and making it a secular, safe, and prosperous country. Even today, the people living in rural areas do not have access to education. These people should be given education free of cost by the government. They should have better job opportunities. In this way only, by knowing the root cause of a problem and then removing it is the way to prosperity and betterment of our nation.
- India's 70% population lives in rural areas and engaged in agriculture. So development of the rural areas along with agriculture is the key factor for India's prosperity. Further, villages are in a state of neglect and underdevelopment. Every village in the country should be provided with basic amenities, like drinking water, electricity, health care, educational transport, communication and other facilities. India should adopt those means towards the progress that are beneficial to the general public.

CONCLUSION

The way Indian economy is making progress for the last few years, is fairly rapid and impressive. However, certain things are still lacking. India is still amongst the developing countries of the world in spite of its man power. Although, today the government of India may claim to be an emerging super power but the reality is quite different from what the government of India or the media of India portray to the world. India's vision for a brighter path will come true not only by mere words or speech, but extra effort needed at all levels to overcome the pitfalls. Practical session is a requisite rather than fruitless theoretical dialogues. Making India, a developed country in is not an easy task. India has to keep in check the population, corruption and pollution and will have to improve the infrastructure in order to transform the nation into a developed country.

REFERENCES

- [1] www.rtiindia.org
- [2] theviewspaper.net/gender-inequality-in-india/
- [3] india.blurtit.com/q294378.html
- [4] The Great Indian Dream, A B&E Monthly Supplement, August-2011
- [5] theviewspaper.net/education-system-of-india
- [6] www.civilserviceindia.com

SESSION IV



services can be wholly trusted by the users who wish to invoke them (and is the current state of the art), it is clearly not scalable into general-purpose Computational Grids. For all delegations that occur in a Grid, the crucial issue is the determination of those rights that should be granted by the user to the service and the circumstances under which those rights are valid. Clearly, delegating too many rights could lead to abuse, while delegating too few rights could prevent the task from being completed. To date, restricted delegation is not used in emerging Grids because it is difficult to design, implement and validate except in very limited, ad hoc cases.

SECURITY CHALLENGES

1. Knowing the minimum set of rights that the execution of a job requires. One of the problems is in how rights are named by various servers.
2. Knowing how many levels of delegation are required. If the user is using code that he did not write he will not know how many servers may be called in accomplishing the task. Even in well known code each job may require access to different sets of servers.
3. When a resource gateway receives a chain of delegated certificates, it must decide whether to trust all the intermediaries that the delegation has gone through. This may require rather large, open-ended trust relationship policies on the part of the gateways. The exact delegation of the users rights may not be under the direct control of the user, and the user may be unaware of the trust relationships of all the hosts in the system. Thus a legitimate request from an authorized and trusted user might arrive at a destination and be rejected because it had passed through an untrusted domain. Recent work has begun to more carefully establish the dimensions along which we would like to restrict delegations. These include:
 - a) Specify the rights that may be delegated.
 - b) Specify a limited time period during which the delegated credential is valid. The problem with this is knowing how long a job will take.
 - c) Specify to what principals (servers or users) the rights may be delegated. Again, knowing the complete set of servers that may be invoked in job execution is problematic. The GSI subgroup of the Security working group of the Grid Forum [8] is also investigating restricted delegation.

IDENTITY MAPPING

Mapping Grid identities to local user IDs is a way to enable a user have a single Grid sign-on and yet support legacy access control mechanisms on those sites that require it. This implies that a user must have local ID at the sites that require one, and that the site administrator and the Grid administrator agree on the mapping to be used by the Grid gateway server. There are several security implications raised by this model: it requires users to have local accounts on any machine they want to use; it may give the user more access to the host than he needs, for example he may be able to run many applications rather than those explicitly specified by the gatekeeper; it requires the Grid administrators to trust the host's access control and accounting procedures, and the local site to trust Grid CA's to correctly identify users, and the Grid software to authenticate them. On the other hand, many existing compute centers require that a user has an account with them and then rely on the underlying OS to do authorization based on the user id. Both the Globus and Legion middleware support such mapping files. A mechanism for allowing the local administrator to specify trust relations with various CA's and other sites could be used rather than a direct mapping of ID's. For example, an administrator might be willing to allow a user signed for by a given CA to run as a trusted user.

GRID INFORMATION SERVICES

Most Grid environments will support an information service to allow potential users to locate resources and to query them about access and availability. In general, sites are unwilling to allow unrestricted access to such detailed information about their sites. Thus, access to this information will be controlled. Current directory services are implemented using the LDAP protocol which has its own user/password based access control. A mechanism is needed to either use Grid credentials as the basis for directory service access control or to map the user's Grid ID to a directory service user name.

GRIDS AND OGSA

Grids pose profound problems like management of virtual organization, delivery of multiple quality of services, autonomic management of infrastructure software and system evolution. OGSA provides foundation for tackling these problems in a rigorous fashion. It provides structured establishment/ maintenance of global properties and reasoning about total system properties.

The recent definition of the Open Grid Services Infrastructure specification and other elements of the Open Grid Services Architecture (OGSA) within the Global Grid Forum introduces new challenges and opportunities for Grid security. In particular integration with Web services and hosting environment technologies introduces opportunities to leverage emerging security standards and technologies such as the Security Assertion Markup Language (SAML) and Web services security. Integration of GSI with OGSA enables the use of Web services techniques to express and publish policy, allowing applications to determine automatically what security policies and mechanisms are required of them. Implementing security in the form of OGSA services allows those services to be used as needed by applications to meet these requirements.

Myths & Realities on Warehousing Management System (WMS)

Suruchi Panday

Abstract— This paper briefly discusses how dynamic computer can be applied within the field of supply chain management (WMS) to diagnose problems and evaluate possible solutions, optimize operations, and mitigate risk factors.

Keywords: WMS, Inventory management, Supply chain management

OBJECTIVE/AIM

Many supply chains strive to shorten the time between a customer's order and the actual delivery of the ordered goods, i.e. the response time. However, a shorter response time may induce a higher volatility in goods flows. We present practical methods to determine layouts for the material handling facilities (warehouses, cross-docking centers and container terminals) which take these inherent variations into account. Advantages and disadvantages of the methods are treated in WMS.

Warehouse Management is a popular keyword appearing in both management science and practice regularly. Globalization and other economical developments lead to a significant increase of large and complex supply chains spanning production sites and distribution networks all over the world. Managing supply chains (WMS) becomes a more and more important but also a highly challenging task. In order to improve operational or tactical decisions in this context discrete-event simulation and (mixed-integer) linear programming are popular. Both of them have advantages but also crucial drawbacks.

INTRODUCTION

Companies face an increasingly challenging marketplace with a growing field of competitors, higher customer expectations, and complex

MANAGING SPACE AND MAINTAINING INVENTORY & THE MYTHS

The era of manual warehouse operations is drawing to a close—with good reason. No matter how efficient your employees are, managing space and maintaining inventory with ad-hoc spreadsheets, paper-based operations, or legacy systems doesn't provide the accuracy, or visibility, into the

supply chain that your managers need to succeed. Today, as businesses of all sizes grow in sophistication, they are turning to best-of-breed warehouse management systems (WMS) in an effort to reduce costs and boost productivity in the face of increased globalization, regulation and competition.

For too long, leading warehouse management systems have seemingly been within the reach of only large third-party distributors, or national and international manufacturers and retailers. No more. To stay competitive, mid-sized and small businesses increasingly are turning to best-of-breed warehouse management systems that effectively reduce costs and streamline daily operations, enabling even the smallest companies to adapt quickly to changing market demands.

The worldwide market for WMS is expected to grow at a 4.8% annual rate, while their projection for adoption of these systems among Tier 3 companies is anticipated to grow at a much brisker rate of 8.2%. Yet, the reality is that many small businesses still believe warehouse management systems are too expensive for their budgets or won't provide the benefits they need to thrive. This may have been true as recently as a few years ago, but as this report will show, WMS for small distributors are now not only within reach and affordable, but they are also a competitive necessity.

The Top Myths Surrounding Small-Business Warehouse Management Systems

Myth 1

A warehouse management system will take months, even up to a year, to install, and cost hundreds of thousands of dollars in consulting and services fees.

Reality

Not so. While some larger WMS implementations can take up to a year and require hefty customization with corresponding consulting fees, there are WMS applications specifically designed for smaller businesses. In fact, with the right best practice-based implementation, deployment can be achieved within 45 business days, including quickly mapping your physical warehouse to your logical warehouse. You just need a software vendor with the right solution, technology, and supply chain experience. Software vendors lacking a demonstrated implementation methodology often see delivery timeframes slip, thus raising the implementation cost.

Myth 2

Any WMS that fits our business now will be too small for us in a couple of years.

Reality

Not always. The trick is to choose the software vendor that can provide you all of the functionality you need today, along with an underlying technology platform that enables future growth. In this way, your WMS should not require extensive new installations or customization. The vendor you choose should be able to provide a straightforward upgrade path to add new functionality or additional modules, such as slotting, labor, yard and transportation management systems—without an entirely new deployment.

Myth 3

WMS software is too expensive for small businesses.

Reality

For less than the annual salary of a skilled programmer, WMS solutions are available that provide everything you need to improve the management of inbound orders, receiving, put-away, picking, packing/shipping, replenishment, inventory control and comprehensive reporting. Some software vendors also provide flexible, even subscription-based, pricing plans. This means nearly any company can afford a WMS that will help it remain flexible, competitive and profitable.

Myth 4

Any vendor that can give me a decently priced WMS will be out of business in a few years.

Reality

There's no doubt that you have to be selective when choosing your software partners. That's why it's vital that you pick a vendor with not only the right solution set and supply chain experience, but one that also has the financial viability to be there for the long haul.

Myth 5

A low, up-front cost for a WMS will automatically provide a lower total cost of ownership over the long term.

Reality

An unusually low price tag on a WMS should set off a warning signal for prospective buyers. Some WMS vendors may choose to drop their asking price to an attractively low number in order to win your business because they anticipate a much higher cost of implementation services once the project is underway. If the product actually is as inexpensive as the price tag indicates, it is reasonable to wonder how much money the vendor can invest in R&D to continually improve your product over time. Make sure you are not buying a legacy product that has limited future viability.

Myth 6

Too small to reap any benefits from a WMS

Reality

Virtually any company, no matter how small, will save on labor, improve inventory management, attain more accurate shipments, improve space allocation, and notice increased customer satisfaction. Because a WMS will give you a highly accurate picture of your inventory—and increase overall visibility—a WMS should significantly reduce the amount of time employees will have to spend figuring out what tasks and actions they need to perform next. And your WMS will reduce paper-driven processes, so your employees will spend less time moving paper, and more time shipping orders.

While there is no set timeframe in which you can expect an ROI without a detailed cost/benefit analysis, the typical time for return on investment will be 6 to 18 months, depending of the effectiveness of the WMS you purchase and the current details of your operations.

Myth 7

I don't need a best-of-breed WMS; my homegrown system already works and gets the job done.

Reality

Could be But how much is the ongoing maintenance and customization of this application really costing your company? Over time, as developers leave (along with their knowledge of the system) custom-developed applications become

increasingly difficult to budget for and support. The systems get more costly to maintain as they become less adaptable to changing business requirements, and each adaptation grows more expensive as documentation ages and troubleshooting becomes more challenging. The reality is that the right WMS should be flexible, adaptable to changing business and market conditions and cost less to support.

Myth 8

Training costs will be too high.

Reality

The right WMS should be designed to simplify your warehouse operations, not complicate them. An intuitive and well-built application should make receiving, picking, shipping and other basic warehouse operations flow smoothly without requiring extensive training. And over the long term—because all of the intelligence of your warehouse operations will rest within the system—your business will flow more effectively even in the event of employee turnover. Another aspect to consider is seasonal employment. If you increase head count during certain periods of the year, a strong WMS will direct and control the operations and enable these temporary workers to get up and running more quickly than before.

Warehouse Management Systems Clearly Benefit Small Businesses Now you have it. It's clear that a WMS designed for small businesses is affordable and rapidly deployable. Your WMS should provide continuous tracking and visibility into your operation; as well as improve productivity, increase accuracy up to 99+%, reduce inventory shrinkage, and improve customer loyalty with more on-time shipments.

Since WMS and vendors vary greatly, it's crucial that you examine them carefully, invest wisely and pick a software vendor with long-term viability, as well as an application that won't require you to purchase more functionality than you need today, yet provide a straightforward and flexible upgrade path in the future.

What questions should I ask potential WMS vendors?

Some WMS buyers make the mistake of focusing too much on the software, and don't look closely enough at the vendor backing it. So be sure that the vendor brings strong financial health, ongoing product support, and long-term viability. Also, check to see if the vendor has a solid base of reference customers, training and user conferences. If the vendor has an active user community, it's a great sign that you'll have a healthy partnership.

When evaluating WMS vendors, be sure to look at:

- Their long-term financial and business stability.
- The upgrade path for their WMS as your business grows or needs change. Does the vendor provide a straightforward upgrade path, or will you require an entirely new installation, product or platform?
- Is it possible to add specific supply chain modules, such as Stores / yard, transportation or labor management?
- Does the vendor bring domain expertise and experience helping companies that are similarly sized and in the same industry as your business?

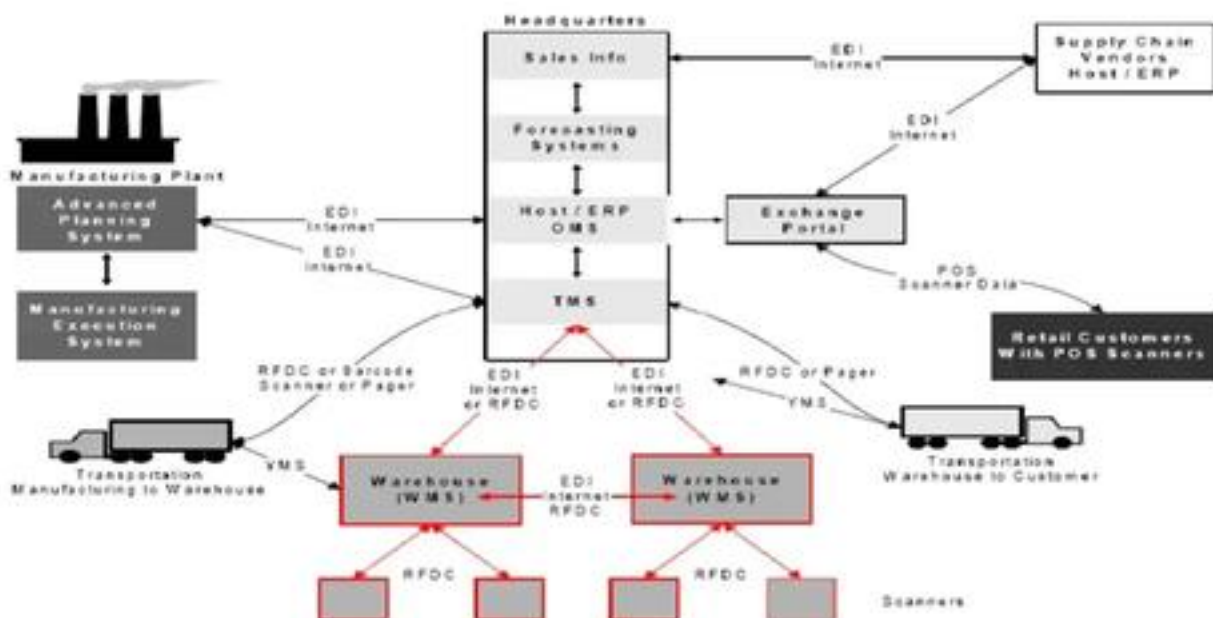


Fig. 1: Yard Management Systems (YMS)

CONCLUSION

The days when leading warehouse management systems were available only to large, top-tier retailers and distributors are over. Many small distributors are now turning to best-of-breed warehouse management systems to attain the cost reduction and streamlined operations required to respond to dynamic market demands and maintain competitive advantage, about ERP Software of WMS:

Forward-thinking companies entrust ERP Software to power their supply chains. ERP Software simplifies the art and business of creating, selling and moving products across global networks. ERP Software helps the clients worldwide drive growth and manage change. Competition, customer demands and sophisticated tools like RFID are bringing new efficiencies to distribution operations that will benefit WMS at all levels.

Despite the challenges and trends identified above, warehousing still revolves around the same core activities: receive, pick, pack and ship. But there are many agents of change working to shape the way supply chains do business. Though the ways in which enterprises adapt to these changes will vary, inertia will not be a viable response. The real challenge facing WMS operations will be to break out of old habits (Myths) and thought processes.

REFERENCES

- [1] Bassan, Y., Roll, Y., and Rosenblatt, M.J., (1980), "Internal layout design of a warehouse,"
- [2] *AIIE Transactions*, vol. 12, no. 4, pp. 317–322.
- [3] Caron, F., Marchet, G., and Perego, A., (2000), "Optimal layout in low-level picker-to-part
- [4] *Systems*," *International Journal of Production Research*, vol. 38, no. 1, pp. 101–117.
- [5] Dekker, R., De Koster, M.B.M., Roodbergen, K.J. and Van Kalleveen, H., (2004), "Improving order-picking response time at Ankor's warehouse," *Interfaces*, vol. 34, no. 4, pp. 303–10 313.
- [6] De Koster, R., Roodbergen, K.J., and Van Voorden, R., (1999), "Reduction of walking time in the distribution center of De Bijenkorf," M.G. Speranza and P. Stähly (Eds.), *New Trends in Distribution Logistics*, Springer, Berlin, pp. 215–234.
- [7] De Treville, S., Shapiro, R.D. and Hameri, A.P., (2004), "From supply chain to demand chain: the role of lead time reduction in improving demand chain performance," *Journal of Operations Management*, vol. 21, no. 6, pp. 613–627.
- [8] Hall, R.W., (1993), "Distance approximations for routing manual pickers in a warehouse," *IIE Transactions*, vol. 25, no. 4, pp. 76–87.
- [9] Law, A.M., and Kelton, W.D., (2000), "Simulation Modeling & Analysis," third edition, McGraw-Hill International Editions, New York.
- [10] Meller, R.D., and Gau, K.Y., (1996), "The facility layout problem: recent and emerging trends and perspectives," *Journal of Manufacturing Systems*, vol. 15, no. 5, pp. 351–366.
- [11] Meller, R.D., Kleiner, B.M., Nussbaum, M.A., (2004), "The facility layout problem: a new model to support a bottom-up approach to facility design," R.D. Meller et al. (Eds.), *Progress in Material Handling Research: (2004)*, Material Handling Institute, Charlotte, NC, to appear.
- [12] Moore, T., Roy, C., (1998), "Manage inventory in a real-time environment," *Transportation & Distribution*, July, pp. 68–73.
- [13] Petersen, C.G., (1997), "An evaluation of order picking routing policies," *International Journal of Operations & Production Management*, vol. 17, no. 11, pp. 1098–1111.
- [14] Petersen, C.G., and Schmenner, R.W., (1999), "An evaluation of routing and volume-based storage policies in an order picking operation," *Decision Sciences*, vol. 30, no. 3, pp. 481–501.
- [15] Ratliff, H.D. and Rosenthal, A.S., (1983), "Orderpicking in a rectangular warehouse: a solvable case of the Traveling Salesman Problem," *Operations Research*, vol. 31, no. 3, pp. 507–521.
- [16] Richardson, H.L., (1999), "Cross docking: information flow saves space," *Transportation & Distribution*, vol. 40, no. 11, pp. 51–54.
- [17] Roodbergen, K.J. and De Koster, R., (2001a), "Routing order pickers in a warehouse with a middle aisle," *European Journal of Operational Research*, vol. 133, no. 1, pp. 32–43.
- [18] Roodbergen, K.J. and De Koster, R., (2001b), "Routing methods for warehouses with multiple cross aisles," *International Journal of Production Research*, vol. 39, no. 9, pp. 1865–1883.
- [19] Schaffer, B., (1997), "Implementing a successful crossdocking operation," *IIE Solutions*, vol. 29, no. 10, pp. 34–36.
- [20] Schaffer, B., (1998), "Cross docking can increase efficiency," *Automatic I.D. News*, vol. 14, no. 8, pp. 34–37.
- [21] Vaughan, T.S., and Petersen, C.G., (1999), "The effect of warehouse cross aisles on order picking efficiency," *International Journal of Production Research*, vol. 37, no. 4, pp. 881–897.
- [22] Vis, I.F.A., (2004), "Cross docking in houseplant distribution," in R.D. Meller et al. (Eds.), *Progress in Material Handling Research: (2004)*, Material Handling Institute, Charlotte, NC, to appear.
- [23] Philip Kotler, "Marketing Management".
- [24] C.R. Kothari, "Research Methodology".

A High Precision Low Power Dynamic Comparator for High Resolution Pipeline ADCs

Deepchand Jaiswal

M.Tech Student, VLSI Design, EC-Department, LNCT Bhopal

Abstract—This paper presents a design of high precision low power dynamic comparator for high-resolution pipeline Analog to Digital Converter (ADC). In today's world, where demands for portable battery operated devices are increasing, a major thrust is given towards low power methodologies for high resolution and high-speed applications. Earlier designers were used pre-amplifier based comparators. The main drawbacks of pre-amplifier based comparators are constant high power consumption. To overcome this problem, authors have designed a high precision dynamic comparator for comparison of every clock period with low power consumption. In present design authors have specially concentrated on low power consumption and high speed. Performance verification of this design is done through simulation using 0.18 μ m CMOS Technology with Cadence environment. Simulation results are reported in this paper and the results are: power dissipation 522 μ W, speed 203.25MHz and offset voltage of around 20mV.

Keywords: Dynamic comparator, ADC, Pipeline, Powerconsumption, Spee.

INTRODUCTION

The main benefits of the pipeline A/D converter architecture are its capability to a high resolution and very large bandwidth with low power consumption in a small area. This is achieved by cascading stages of 1 to 3 bits resolution working concurrently [1]. The comparator forms the core of the sub-ADCs, which are usually flash A/D converters, of such pipeline ADC stages. The design of the comparator has an essential effect on the ADC accuracy and power consumption. Comparison of the new architecture with respect to typical differential pair structure is made as both structures share the same base structure [2]. This implies that also the comparator should be fully differential – even with differential reference voltages. Very low power dissipation can be obtained with dynamic comparators, which are turned off when they are inactive. Such comparator topologies have inevitably fairly large offset voltages; because no static pre-amplification exists in the front of a latch part which makes them less favorable in flash based ADC architectures [3] [4]. Few authors talk about how non-idealities due to process variation affect these structures along with experimental results to compare offset values of different structures based on sensitivity analysis with respect to different non-idealities has been carried out to validate the advantages of the new structure over typical differential pair comparator [5]. Offset, power consumption and immunity to noise and mismatches are the most important specification of comparator. In a mixed mode circuit, which an ADC always is, fully differential analog signals are preferred to get a better power supply rejection and immunity to common mode noise. In pipeline ADCs, digital correction techniques along with adequate over-range protection can tolerate such large offsets. However, the literature is devoid of any information on how other non-idealities such as imbalance in parasitic capacitors, common mode (CM) voltage errors or clock-timing errors affect these structures. The operation and the effects of non-idealities of such dynamic comparators have been investigated and new dynamic comparator structure, which achieves a low offset, has been developed [6]-[7]

MATHEMATICAL ANALYSIS

Formulas for calculation of threshold voltage based on transistors widths is presented in [2] and by using this relation between widths of input transistors pairs M1-M4 to get the required switching voltage at $V_{ref}/4$. The transistors connected to the input and reference (M1 – M4) are in the triode region and act like voltage controlled resistors. If no mismatch is present the comparator changes its output when the conductance of the left and right input branches are equal $g_L = g_R$. By denoting $W_A = W_2 = W_4$ and $W_B = W_1 = W_3$ the input voltage where the comparator changes the state is:

$$(V_{in+}) - (V_{in-}) = W_B/W_A [(V_{ref+}) - (V_{ref-})]$$

By dimensioning of the transistor widths W_A and W_B the threshold of the comparator can be adjusted to the desired level.

SAMPLING FREQUENCY

The sampling frequency –*fsampling*– is defined as the reciprocal of the time interval T , as [8]:

$$f_{sampling} = 1/T$$

The sampling frequency has to be equal or greater than twice of the frequency bandwidth of analog signals.

POWER DISSIPATION

Dynamic comparator power dissipation resembles that of digital gates, which have a power dissipation given approximately by:

$$P = f \cdot C \cdot VDD^2 \quad (3)$$

Where, f is the output frequency, VDD is the supply voltage, and C is the output capacitance.

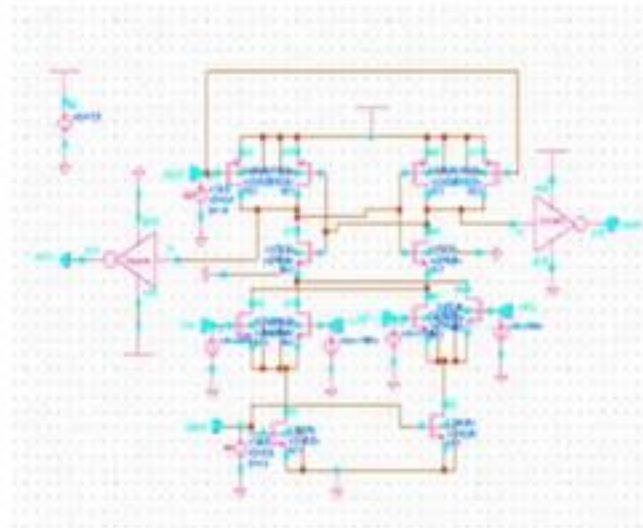


Fig. 1: Schematic View of Dynamic Comparator

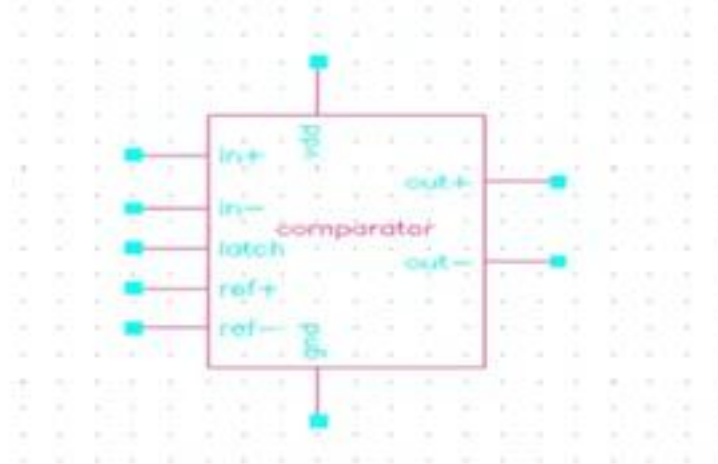


Fig. 2: Symbolic View of Comparator

PROPOSED COMPARATOR DESIGN

In order to make a dynamic comparator more robust against mismatch and process variations all transistors should be in saturation after the latching signal. Schematic view of a fully differential typical dynamic comparator is given in Fig. 1 and its Symbol is shown in Fig. 2. In this proposed design authors have used the current sources as switches and the latch circuit is connected directly between the source coupled pairs and the supply voltage. It is based on two cross-coupled differential pairs with switched current sources loaded by a CMOS latch. The trip point of the comparator can be set by introducing imbalance between the source coupled pairs. Because of the dynamic current sources together with the latch, connected directly between the differential pairs and the supply voltage, the comparator does not dissipate DC power.

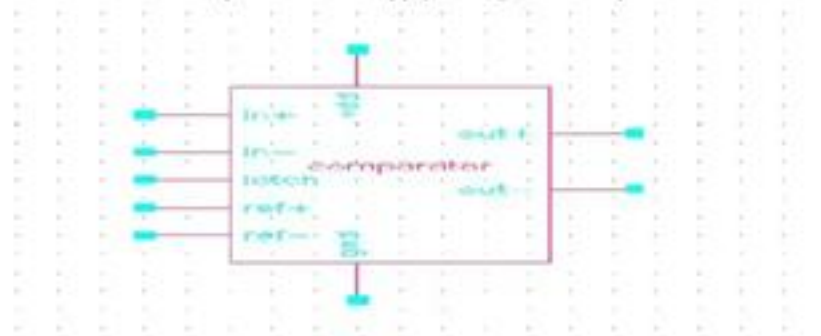


Fig. 2: Symbolic View of Comparator

Here authors have set the transistors sizes that are large enough to minimize offset voltage then set length of all transistors to $1\mu\text{m}$ and determine W/L to reduce over drive voltage. This work is done in the cadence environment. Design has used two inverters at the output of the comparator to achieve required fan-out. The threshold voltage of the comparator is determined by the current division in the differential pairs and cross coupled branches.

SIMULATION RESULTS AND DISCUSSION

The proposed designed is completed in $0.18\mu\text{m}$ CMOS technology. In this design supply voltage was 1.8V and clock period 4.92ns . Transistors are dimensioned so that the area of both comparators are in the same size range and the input and current source transistors have a channel length $L = 1\mu\text{m}$. The comparator threshold levels are set with the input transistor dimensioning to $V_{in} = \frac{1}{2}V_{ref}$. During the process, speed of the comparator was $203.25\text{Mega samples/sec}$. This design can be used where low power, high speed and low propagation delay are the main requirements. Simulation results of the comparator are presented in Fig. 3. In addition we have also presented the results of output current and power dissipation of this design as shown in Fig. 4 and Fig. 5 respectively

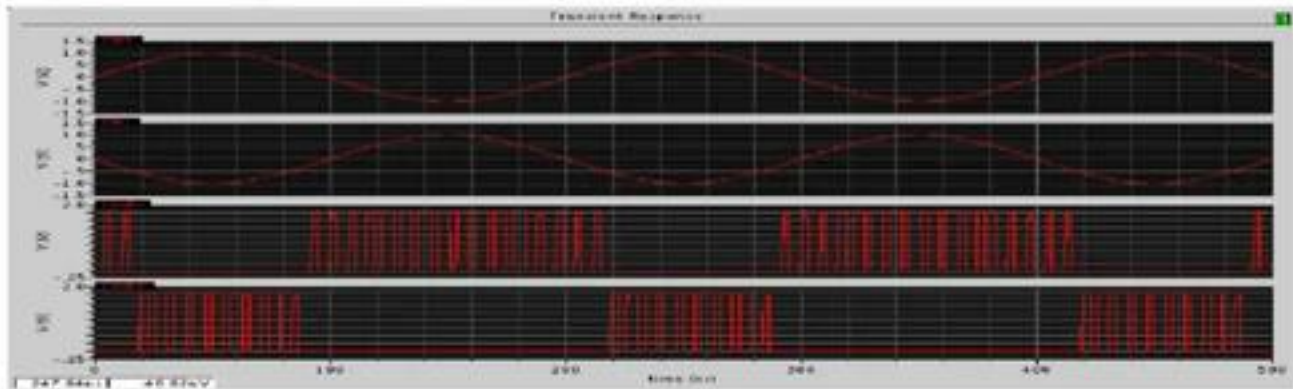


Fig. 3: Simulation Results of Comparator

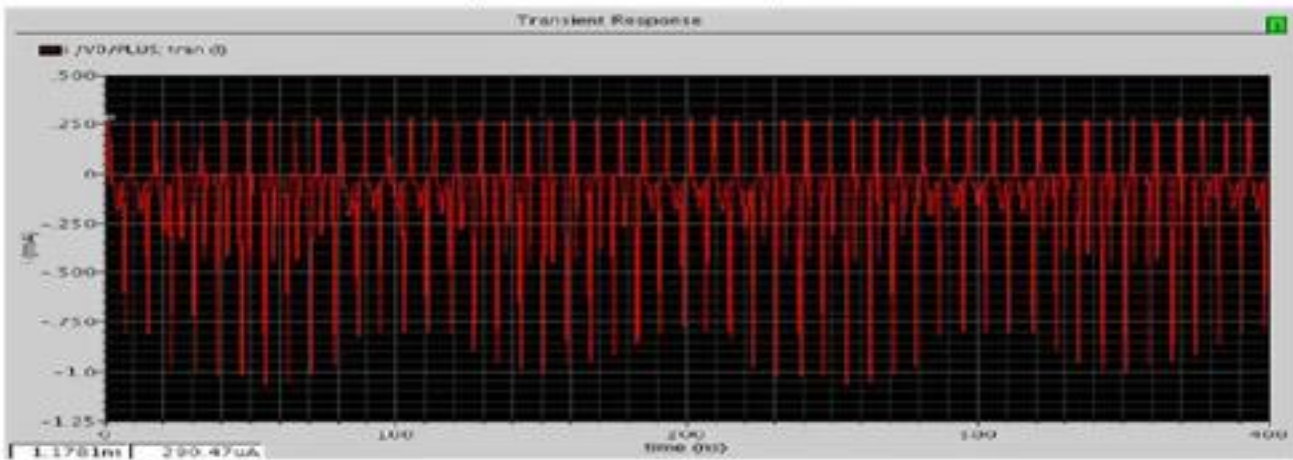


Fig. 4: Simulated Output Current of Comparator

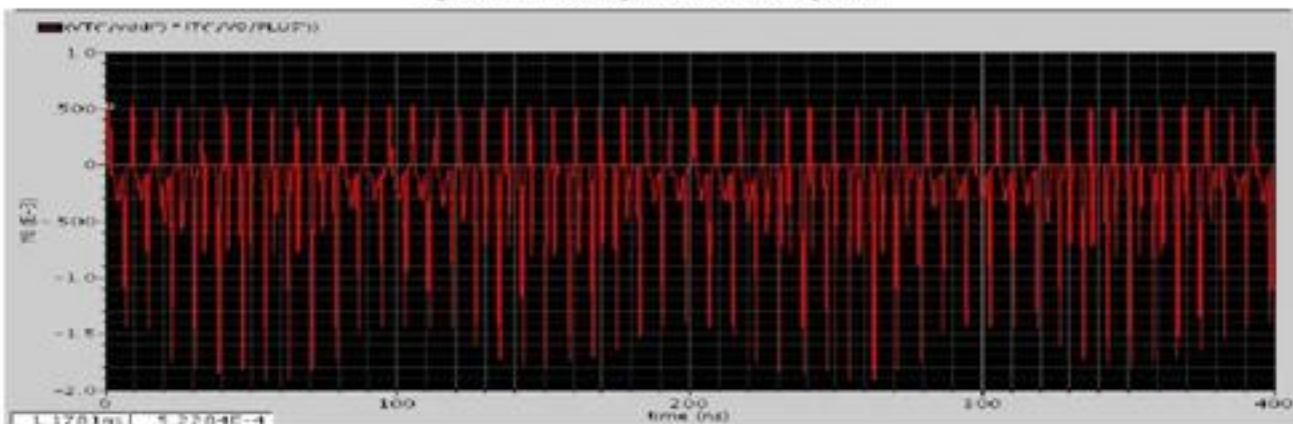


Fig. 5: Simulation Results of Power Dissipation

Table 1: Comparison of Present Results with Earlier Reported Work

Reference	Technology (CMOS)	Sampling Rate	Power Dispation	Voltage Supply
[1]	0.5 μ m	200 MHz	804 μ W	2V
[2]	0.5 μ m	200 MHz	837 μ W	1.8V
Present results	0.18 μ m	203.25MHz	522 μ W	1.8V

CONCLUSION

This paper is presented the fully differential dynamic comparator design and its simulation results for high speed, low power consumption. Design is based on two cross-coupled differential pairs and switchable current sources, has a small area and low power dissipation. Present design is suitable for high resolution Pipeline A/D Converters. Simulation results are obtained and compared to earlier reported work as given in Table 1 and some improvements are observed in present results.

REFERENCES

- [1] Cho, T. B. and Gray, P. R. (1995),—A 10 b, 20 Msample/s, 35mW Pipeline A/D Converter,|| IEEE JSSC, vol. SC-30, pp. 166-172, Mar.
- [2] Sumanen, L., Waltari, M. and Halonen, K. (2000)—A Mismatch Insensitive CMOS Dynamic Comparator for Pipeline A/D Converters,|| IEEE ICECS, vol.1, pp. 32-35, Dec.
- [3] Waltari, M. and Halonen, K. (2001)—1-V 9-Bit Pipelined Switched-Opamp ADC,|| IEEE JSSC, vol. 36, pp. 129-134, Jan.
- [4] Chiu, Y., Gray, P. R. and Nikolić, B., (2004)—A 14-b 12-MS/s CMOS Pipeline ADC With Over 100-dB SFDR, IEEE JSSC, vol. 39, pp. 2139-2151, Dec.
- [5] Sumanen, L., Waltari, M., Hakkarainen, V. and Halonen, K.,(2002),—CMOS Dynamic Comparators for Pipeline A/D Converters,|| IEEE ISCAS, vol. 5, pp. 157-160, May.
- [6] Savengsveksa, V., Heedley, P. L., Matthews, T., Ahmad, K. and Negrete, J., (2005),—An 8-b 20-Msample/s Pipelined A/D Converter in 0.5- μ m CMOS with 7.8 ENOB,|| IEEE MWSCAS, pp. 409-412, Aug.
- [7] Matthews, T. W. and Heedley, P. L. ,(2005),—A Simulation Method for Accurately Determining DC and Dynamic Offset in Comparators,|| IEEE MWSCAS, pp. 1815-1818, Aug.
- [8] Panchore, M. and Gamad, R. S.,(2010),—Low Power and High Speed CMOS Comparator Design Using 0.18 μ m Technology, International Journal of Electronic Engineering Research, Research India Publications Vol. 2,No.1,pp71-77.

An Algorithm for Task Assignment in Distributed Network using Static Approach

Kapil Govil
CMCA, TMU, Moradabad

Abstract—The distributed processing environments [dpe] in which services provided for the network reside at multiple sites. Instead of single large machine being responsible for all aspects of process, each separate processor handles subset. In the distributed environments the program or tasks are also often developed with the subsets of independent units under various environments. The allocation problems in any computer system play the key role for deciding the performance of the system. The allocation put the direct impact of software resources as well as hardware resources. In distributed computer systems, partitioning of the application software in to module and the proper allocation of these modules dissimilar processors are important factors, which determine the efficient utilization of resources. The static model discussed in this paper provide an optimal solution using algorithm of assignment problem for assigning a set of "m" modules of a task to a set of "n" processors where $m > n$ in a computer system for evaluation for optimal time of the system.

Keywords: Distributed Processing Environment, Processor, Task, Allocation, and Assignment Problem.

INTRODUCTION

A system in which a large number of separate but interconnected computers do the jobs is called distributed network. In distributed network, services reside at multiple sites. Instead of single large processor being responsible for all aspects of process, there are several separate processor handles these aspects. A distributed network is looks like a virtual uniprocessor. In the distributed networking the program or tasks are also often developed with the subsets of independent units under distributed environments. It has seen that this concept is cost-effective and reliable to meet the optimal solution.

One of the major research problems for distributed networks is the allocation problem, in which tasks are assigned to various processors of the network, in such a way that processing time is to be minimized as per the requirement. These problems may be categorized as static [2, 10, 11, 13] and dynamic [1, 6, 12, 13, 16] types of task allocation. Some of the other related methods have been reported in the literature, such as, Integer Programming [3, 5, 14, 15], Load Balancing [4, 6, 18] and Modeling [7, 9, 17]. Tasks are allocated to various processors of the distributed network in such a way that overall processing time of the network should be minimized. As it is well known that the tasks are more than the number of processors of the network.

OBJECTIVE

The objective of the present research paper is to enhance the performance of the distributed networks by using the proper utilization of its processors and as well as proper allocation of tasks. The type of allocation of task to the processor is static. As in this paper the performance is measured in terms of time, so we have to minimize the time to obtain the best performance of the processors.

TECHNIQUE

In order to evaluate the overall optimal processing time of a distributed network, we have chosen the problem where a set $P = \{p_1, p_2, p_3, \dots, p_n\}$ of 'n' processors and a set $T = \{t_1, t_2, t_3, \dots, t_m\}$ of 'm' tasks, where $m > n$. The processing time of each task to each and every processor is known and it is mentioned in the Processing Time Matrix of order $m \times n$. After making a matrix of same order taking in ascending order of its sum of row and sum of column, we apply the algorithm of assignment problem on it. For each processor we evaluate the overall assignment of each task; and assignment of the task on the processor which has the minimum processing time. Finally we compute total processing by adding total processing time of task, which are assigned at specified processor.

ALGORITHM

```
Start algo
Read the number of task in m
Read the number of processor in n
For i = 1 to m
  For j = 1 to n
    Read the value of processing time (t) in Processor Time Matrix namely PTM (.)
  j = j + 1
Endfor
```

```

i = i + 1
Endfor
Arrange the PTM(.) in ascending order of its row_sum and column_sum
i = 1
While all tasks != SELECTED
Select the biggest possible square matrix from left upper corner and store it into SM(.)
Apply algorithm of Assignment Problem [8] on SM(.)
i = i + 1
Endwhile
Club processorwise overall optimal processing time
State the results
End algo

```

IMPLEMENTATION

In the present research paper, the distributed network consist a set P of 4 processors $\{p_1, p_2, p_3, p_4\}$ and a set T of 10 tasks $\{t_1, t_2, t_3, t_4, t_5, t_6, t_7, t_8, t_9, t_{10}\}$. It is shown in the figure1. The processing time (t) of each task to each and every processor is known and it is mentioned in the Processor Time Matrix PTM (,) of order 10 x 4.

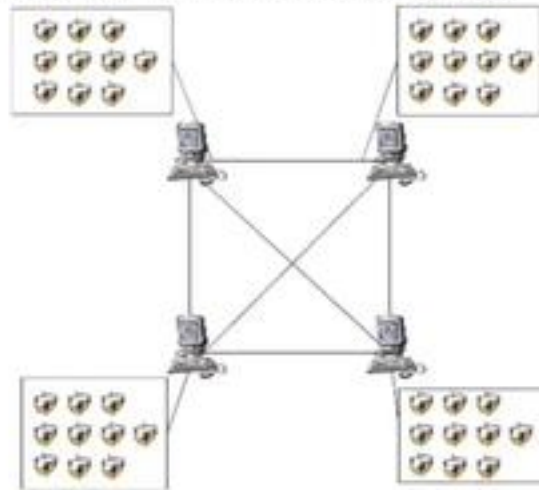


Fig. 1: Processor Task Combination

	p_1	p_2	p_3	p_4
t_1	6	2	9	3
t_2	5	3	2	1
t_3	8	7	3	4
t_4	1	4	6	3
t_5	4	5	6	2
t_6	2	1	8	9
t_7	2	8	6	7
t_8	6	7	8	9
t_9	4	5	6	2
t_{10}	3	7	4	2

Now, calculate the sum of each row and column and store the results in Modified Processor Task Matrix MPTM(.) of order 10 x 4.

	p_1	p_2	p_3	p_4	Row_Sum
--	-------	-------	-------	-------	---------

MOTIVATION FOR OGSA

OGSA has three main predecessors:

- Globus Toolkit
- Autonomic computing initiative
- Emerging Web Services standards

There are several needs for building a robust grid environment. The following list describe some of them and how OGSA is addressing those needs.

DYNAMIC SERVICE CREATION

Virtual organization participants want more than persistent static services, where each interaction can be considered completely separate. They want to be able to create service instances to handle the management and interactions associated with the state of particular activities. To allow a dynamic service creation, OGSA uses the concept of a service factory (Factory port Type), something we can use to create an instance of the service we desire. Transience is not a problem; since the factory is a persistent service, we can always create another instance at any point in the future.

DYNAMIC SERVICE MANAGEMENT

We need a mechanism to identify a service instance once created. We may wish to return to that same instance to examine its state or it may be building up results from many other asynchronous services. OGSA addresses this need with the Handle Resolver port Type, Grid Service References (GSR), and Grid Service Handles (GSH). Once the service instance has been created, how can we allow anyone to connect to it and read/update its state? GSH provides a unique way of naming all OGSA services, but it does not enable us to use the service instance; we need the GSR to do this. We must have a way to convert a GSH into a GSR before we can actually use the service instance. For this task, OGSA uses a Handle Resolver port Type that takes a GSH and returns a GSR, which contains protocol and instance specific data to allow anyone to connect to the service instance.

UPGRADE ABILITY AND COMPATIBILITY

A mechanism is required to upgrade services over time, and we might like to know if the new upgraded service is still compatible with the older version. We cannot guarantee that this service upgrade will take place at a convenient time. A client may be interacting with a service while the upgrade takes place; ideally, the client is never aware the upgrade has happened. However, if the service as a result of the upgrade now supports different protocols or additional functions, the client may wish to know. A infrastructure should be provided to allow clients to become aware of these changes. OGSA addresses this need by providing the Grid Service port Type. GSR does not solve the upgrade ability problem, since changes effectively invalidates the GSR. We do not know who has the old GSR, so we cannot tell them what has changed.

GSH is effectively the GSR without protocol or instance specific information; this is unique for our service instance and will not change, even after upgrading our service instance. So if we use the GSH to tell everyone about our service instance, then this will still remain valid after an upgrade.

GSR will have a lifetime associated with it. This is an indication of how long the GSR is expected to be valid, which saves us the need to convert the GSH into a GSR. Of course, we may discover the GSR is invalid after all and still have to convert a GSH into a GSR, but until this point, we do not have the overhead of this conversion before connecting to the service instance.

NOTIFICATION

A collection of distributed services must be able to notify each other of asynchronously changing states. There should be a basic standard mechanism to allow the subscription for notification from a service and delivery of these notifications. OGSA addresses this notification issue by using the Notification-Source port Type, Notification-Sink port Type and Notification-Subscription port Type. OGSA defines a source and access to support notification. You can give your notification to a service instance's notification source or use the subscription mechanism to give some indication of the notifications you are interested in. You could even give the access for another service and not receive the notifications directly, and you may wish to ensure the source has a lifetime as long as you are interested in the notifications.

PROBLEM FORMULATION

Network security related issues of Grid computing:

Network security is becoming one of the most important areas of research, especially in the context of the internet. In the last few years, several internet level security attacks and vulnerabilities has resulted in a surge in the activities in the field. Grid computing being a distributed system naturally requires networking infrastructure for its functioning. In addition grid adds complexities in terms of heterogeneity and high speed interconnects which had complexities in terms of

$$\text{MPTM}(,) = \begin{matrix} t_1 \\ t_2 \\ t_3 \\ t_4 \\ t_5 \\ t_6 \\ t_7 \\ t_8 \\ t_9 \\ t_{10} \end{matrix} \begin{bmatrix} 6 & 2 & 9 & 3 \\ 5 & 3 & 2 & 1 \\ 8 & 7 & 3 & 4 \\ 1 & 4 & 6 & 3 \\ 4 & 5 & 6 & 2 \\ 2 & 1 & 8 & 9 \\ 2 & 8 & 6 & 7 \\ 6 & 7 & 8 & 9 \\ 4 & 5 & 6 & 2 \\ 3 & 7 & 4 & 2 \end{bmatrix} \begin{matrix} 20 \\ 11 \\ 22 \\ 14 \\ 17 \\ 20 \\ 23 \\ 30 \\ 17 \\ 16 \end{matrix}$$

Column_Sum 41 49 58 42

By arranging the MPTM (,) in ascending order of their row_sum and column_sum, we get Arranged Processor Task Matrix APTM (,) of order 10 x 4.

$$\begin{matrix} p_1 & p_4 & p_2 & p_3 & \text{Row_Sum} \\ t_2 \\ t_4 \\ t_{10} \\ t_5 \\ t_9 \\ t_1 \\ t_6 \\ t_3 \\ t_7 \\ t_8 \end{matrix} \begin{bmatrix} 5 & 1 & 3 & 2 \\ 1 & 3 & 4 & 6 \\ 3 & 2 & 7 & 4 \\ 4 & 2 & 5 & 6 \\ 4 & 2 & 5 & 6 \\ 6 & 3 & 2 & 9 \\ 2 & 9 & 1 & 8 \\ 8 & 4 & 7 & 3 \\ 2 & 7 & 8 & 6 \\ 6 & 9 & 7 & 8 \end{bmatrix} \begin{matrix} 11 \\ 14 \\ 16 \\ 17 \\ 17 \\ 20 \\ 20 \\ 22 \\ 23 \\ 30 \end{matrix}$$

Column_Sum 41 42 49 58

Now, selecting the biggest possible square matrix from left upper corner, we get Selected Matrix SM₁(,) of order 4 x 4.

$$\begin{matrix} p_1 & p_4 & p_2 & p_3 \\ t_2 \\ t_4 \\ t_{10} \\ t_5 \end{matrix} \begin{bmatrix} 5 & 1 & 3 & 2 \\ 1 & 3 & 4 & 6 \\ 3 & 2 & 7 & 4 \\ 4 & 2 & 5 & 6 \end{bmatrix}$$

Now, by using algorithm of Assignment Problem [8] on SM₁(,), we get task allocation as –

Processor	Task
p ₁	t ₄
p ₂	t ₂
p ₃	t ₁₀
p ₄	t ₅

Now, we eliminate allocated tasks (i.e. t₂, t₄, t₅, t₁₀) from APTM (,); and again selecting the biggest possible square matrix from left upper corner, we get selected matrix SM₂(,) of order 4 x 4.

$$SM_2(.) = \begin{matrix} & P_1 & P_4 & P_2 & P_3 \\ \begin{matrix} t_9 \\ t_1 \\ t_6 \\ t_3 \end{matrix} & \begin{bmatrix} 4 & 2 & 5 & 6 \\ 6 & 3 & 2 & 9 \\ 2 & 9 & 1 & 8 \\ 8 & 4 & 7 & 3 \end{bmatrix} \end{matrix}$$

Now, on applying the algorithm of Assignment Problem [8] on matrix $SM_2(.)$, we get task allocation as –

Processor	Task
p_1	t_6
p_2	t_1
p_3	t_3
p_4	t_9

Again, we eliminate allocate tasks (i.e. t_1, t_3, t_6, t_9) from APTM $(.)$ and again selecting the biggest possible square matrix from left upper corner, we get Selected Matrix $SM_3(.)$ of order 2×2 .

$$SM_3(.) = \begin{matrix} & P_1 & P_2 \\ \begin{matrix} t_7 \\ t_8 \end{matrix} & \begin{bmatrix} 2 & 7 \\ 6 & 9 \end{bmatrix} \end{matrix}$$

Now, on applying the algorithm of Assignment Problem [8] on matrix $SM_3(.)$, we get task allocation as –

Processor	Task
p_1	t_7
p_2	-
p_3	-
p_4	t_8

The overall processorwise task allocation along with optimal processing time is mentioned in table1.

Table 1: Processorwise Task Allocation

Processor	Assigned Task	Processing Time
p_1	$t_6 * t_7 * t_9$	5
p_2	$t_1 * t_2$	5
p_3	$t_3 * t_{10}$	7
p_4	$t_5 * t_8 * t_4$	13
Overall Optimal Processing Time		30

The graphical representation of the optimal assignment is shown in figure 2.

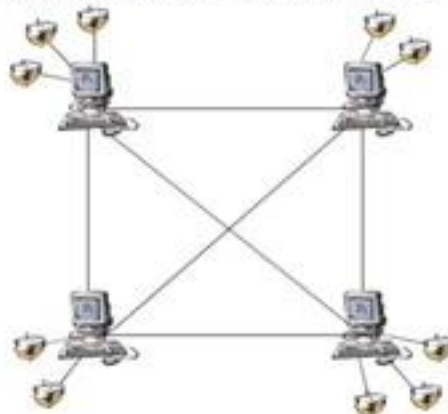


Fig. 2: Optimal Assignment

The processorwise processing time graph is shown in the figure 3.

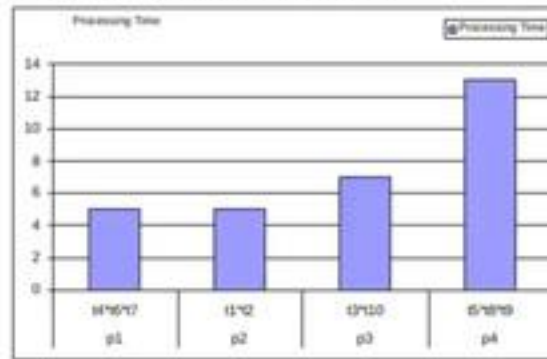


Fig. 3: Processorwise Processing Time Graph

CONCLUSION

In this research paper we have chosen the problem, in which the number of the tasks is more than the number of processors of the distributed network. The model mentioned in this paper is based on the consideration of processing time of the tasks to various processors. The method is presented in pseudo code and implemented on the several sets of input data to test the performance and effectiveness of the pseudo code. It is the common requirement for any assignment problem that the tasks have to be processed with minimum time. Here, performance is measured in terms of processing time of the task that has been processed by the processors of the network and also these tasks have been processed optimally. As we know that, the analysis of an algorithm is mainly focuses on time complexity. Time complexity is a function of input size 'n'. It is referred to as the amount of time required by an algorithm to run to completion. The time complexity of the above mentioned algorithm is $O(mn)$. By taking several input examples, the above algorithm returns following results as in table 2.

Table 2: Optimal Results

No. of Processors (n)	No. of Tasks (m)	Optimal Results
3	4	12
3	5	15
3	6	18
3	7	21
3	8	24
4	5	20
4	6	24
4	7	28
4	8	32
4	9	36
5	6	30
5	7	35
5	8	40
5	9	45
5	10	50

The graphical representation of results of table 2 are shown by figure 4, 5 and 6 as mentioned below,

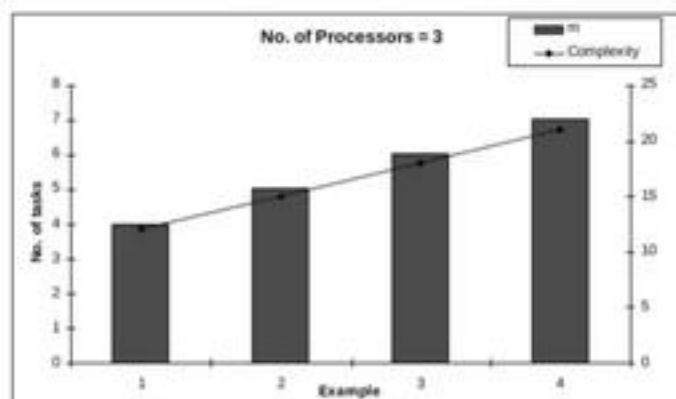


Fig. 4: Complexity Graph

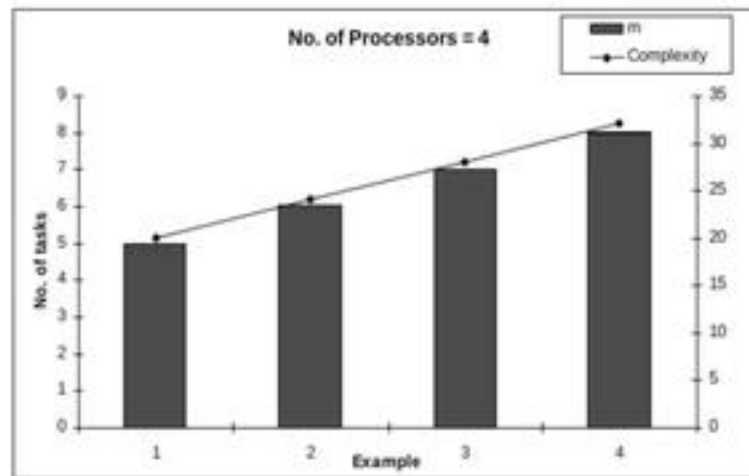


Fig. 5: Complexity Graph

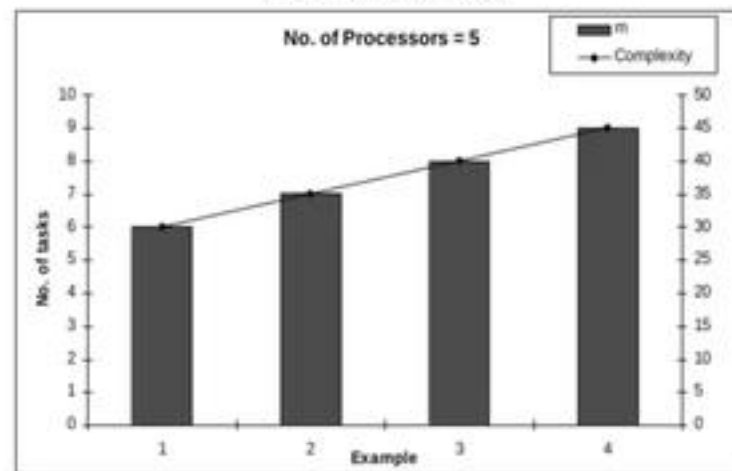


Fig. 6: Complexity Graph

The performance of the algorithm is compared with the algorithm suggested by Sagar et. al. [19]. Table 3, shows the time complexity comparison between algorithm [19] and present algorithm.

From the table 3, it is clear that present algorithm is much better for optimal allocation of tasks that upgrade the performance of distributed network. Figures 7, 8 and 9 shows the pictorial representation between algorithm [19] and present algorithm

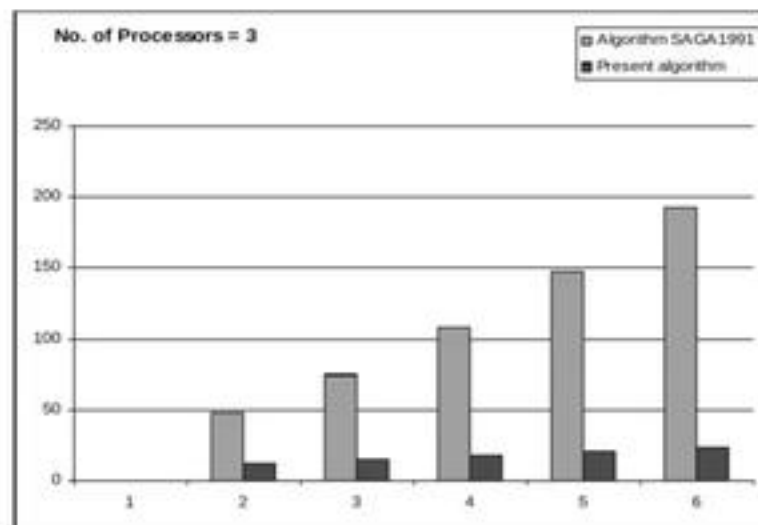


Fig. 7: Comparison Graph

Table 3: Comparison Table

Processors n	Tasks m	Time Complexity of Algorithm [19] $O(m^n)$	Time Complexity of Present Algorithm $O(mn)$
3	4	48	12
3	5	75	15
3	6	108	18
3	7	147	21
3	8	192	24
4	5	100	20
4	6	144	24
4	7	196	28
4	8	256	32
4	9	324	36
5	6	180	30
5	7	245	35
5	8	320	40
5	9	405	45
5	10	500	50

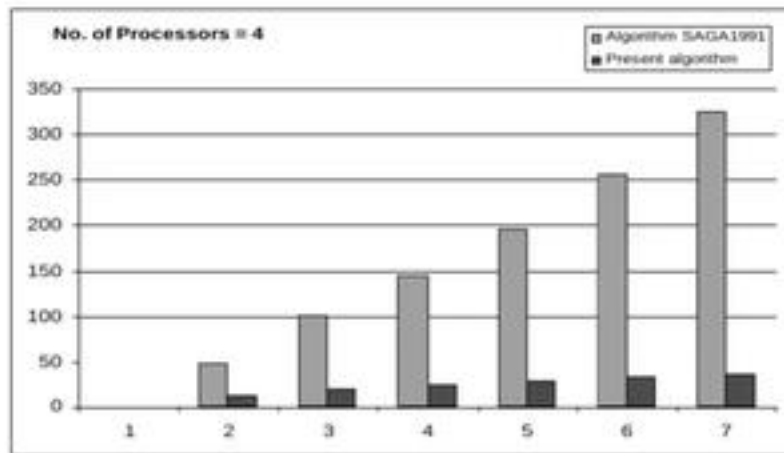


Fig. 8: Comparison Graph

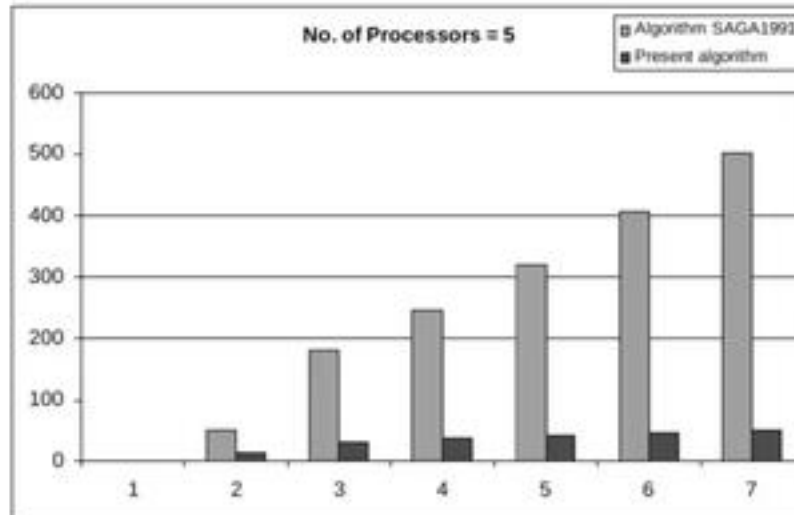


Fig. 9: Comparison Graph

REFERENCES

- [1] Kumar, Avanish, (1999), "Optimizing for the Dynamic Task Allocation," Proceedings of the 'III Conference of the International Academy of Physical Sciences, Allahabad, pp281-294.
- [2] Kumar, Avanish, (2001), "An Algorithm for Optimal Index to Tasks Allocation Based on Reliability and cost," Proceedings of 'International Conference on Mathematical Modeling, Roorkee, pp150-155.
- [3] Ensink, Brian, Stanley, Joel and Adve, Vikram, (2003), "Program Control Language: a programming language for adaptive distributed applications," Elsevier Inc., Vol. 63, No. 12, pp1082-1104.

- [4] Grosu, Daniel and Chronopoulos, Anthony T., (2005), "Noncooperative load balancing in distributed systems," Elsevier Inc., Vol. 65, No. 9, pp1022-1034.
- [5] Dessouki-O.I. and Hana, W. H., (1980), "Distributed Enumeration on Network Computers," IEEE Transactions on Computer, Vol. 29, pp818-825.
- [6] Bahi, Jacques, Couturier, Raphael and Vernier, Flavien, (2005), "Synchronous distributed load balancing on dynamic networks," Elsevier Inc., Vol. 65, No. 11, pp1397-1405.
- [7] Contreras, Javier, Losi, Arturo, Russo, Mario and Wu, Felix F., (2000), "DistOpt: A Software Framework for Modeling and Evaluating Optimization Problem Solutions in Distributed Environments," Elsevier Inc., Vol. 60, No. 6, pp741-763.
- [8] Swaroop, Kant, Gupta, P. K. and Mohan, Man, (2002), Operations Research, Sultan Chand & Sons, ISBN No.: 8180540200.
- [9] Fitzgerald, Kent, Latifi, Shahram and Srimani, Pradip K., (2002), "Reliability Modeling and Assessment of the Star-Graph Networks," IEEE Transactions on Reliability, Vol. 51, pp49-57.
- [10] Kumar, A., Singh, M. P. and Yadav, P. K., (1995), "An Efficient Algorithm for Allocating Tasks to Processors in a Distributed System," Proceedings of the 19th National System Conference, SSI, Coimbatore, pp82-87.
- [11] Kumar, A., Singh, M. P. and Yadav, P. K., (1995), "A Fast Algorithm for Allocating Tasks in Distributed Processing System," Proceedings of the 30th Annual Convention of CSI, Hyderabad, pp347-358.
- [12] Kumar, A., Singh, M. P. and Yadav, P. K., (1996), "An Efficient Algorithm for Multi-processor Scheduling with Dynamic Reassignment," Proceedings of the 6th National seminar on theoretical Computer Science, Banasthally Vidyapeeth, pp105-118.
- [13] Kwok, Yu-Kwong, Maciejewski, Anthony A., Siegel, Howard Jay, Ahmad, Ishfaq and Ghaloor, Arif, (2006), "A semi-static approach to mapping dynamic iterative tasks onto heterogeneous computing systems," Elsevier Inc., Vol. 66, No. 1, pp77-98.
- [14] Misra, K. B. and Sharma, U., (1991), "An Efficient Algorithm to solve Integer Programming Problem arising in System Reliability Design," IEEE Transactions on Reliability, Vol. 40, pp81-91.
- [15] Dbodhi, Muhammad K., Ahmad, Imtiaz, Yatama, Anwar and Ahmad, Ishfaq, (2002), "An Integrated Technique for Task Matching and Scheduling onto Distributed Heterogeneous Computing Systems," Elsevier Inc., Vol. 62, No. 9, pp1338-1361.
- [16] Palmer, J. and Mitrani, I., (2005), "Optimal and heuristic policies for dynamic server allocation," Elsevier Inc., Vol. 65, No. 10, pp. 1204-1211.
- [17] Bierbaum, Rene L., Brown, Thomas D. and Kerschen, Thomas J., (2002), "Model-Based Reliability Analysis," IEEE Transactions on Reliability, Vol. 51, pp133-140.
- [18] Iqbal, Saeed and Carey, Graham F., (2005), "Performance analysis of dynamic load balancing algorithms with variable number of processors," Elsevier Inc., Vol. 65, No. 8, pp934-948.
- [19] Sagar, G. and Sarje, A. K., (1991), "Task Allocation Model for Distributed System," International Journal of System Science, Vol. 22, pp1671-1678.

Modified Cellular Message Encryption Algorithm

Ravindra Kumar Gupta¹ and Subhash Chandra Gupta²

¹Asst. Prof., Dept. of Computer Science & Engineering

²Student, M. Tech. (Software Engineering),

SSSIST, Bhopal, M.P.

Abstract—This paper analyzes the Modified Cellular Message Encryption Algorithm (M-CMEA) which is an enhanced version of the Telecommunication Industry Association's Cellular Message Encryption Algorithm. We analyzed more properties to, "Why is CMEA weak?" and modification required to secure the CMEA.

Keywords: Cryptanalysis, CMEA, Wireless Security, Algorithm.

INTRODUCTION

The cellular Message Encryption Algorithm (CMEA) has been designed by the TIA (Telecommunication Industry Association) to protect the control data of cellular phone communication. As cellular telephony industry has boomed, the need for security has increased: both for privacy and fraud prevention. Because all cellular communications are sent over a radio link, anyone with the appropriate receiver can passively eavesdrop on all cell phone transmissions in the area without fear of detection. The cellular telephony industry players in particular are especially concerned with fraud prevention.

The aim of the paper is to improve the security of the CMEA algorithm. This paper performs a thorough analysis of the weaknesses identified in the CMEA [1,2] and proposes a modified version of the algorithm which we shall call the "Modified-CMEA" or "M-CMEA". Thus the paper focuses on the following:

- Identifying the properties of the CMEA leading to its inherent insecurity. Modify the algorithm so as to remove the causes of the easy cryptanalysis of the CMEA [3].
- Carrying out the cryptanalysis of the M-CMEA against specialized attacks [2,3] as well as standard cryptanalytic attacks.

We discussed the original CMEA and attacks against it in section 2. In section 3, we describe the properties of CMEA and analyze these properties. In section 5, we discussed detail modification required to CMEA to become more secure.

CELLULAR MESSAGE ENCRYPTION ALGORITHM (CMEA)

Description of CMEA

We describe the CMEA specification in brief for reference. CMEA is a byte oriented variable-width block cipher with a 64 bit key. Block sizes may be any number of bytes. In practice, US cellular telephony systems typically apply CMEA to 2-6 byte blocks, with the block size potentially varying without any key changes. CMEA is quite simple, and appears to be optimized for 8-bit microprocessors with severe resource limitations.

CMEA consists of three layers. The first layer performs one non-linear pass on the block, this effects left-to-right diffusion. The second layer is a purely linear, unkeyed operation intended to make changes propagate in the opposite direction. One can think of the second step as (roughly speaking) XORing the right half of the block onto the left half. The third layer performs a final nonlinear pass on the block from left to right; in fact, it is the inverse of the first layer.

CMEA obtains the non-linearity in the first and third layer from an 8-bit keyed lookup table known as the T-box. The T-box calculates its 8-bit output as

$$T(X) = C(((C(((C(((C(X \oplus K_0) + K_1) + X) \oplus K_2) + K_3) + X) \oplus K_4) + K_5) + X) \oplus K_6) + K_7) + X,$$

Given input byte x and 8-byte key $K_{0..7}$. In this equation C is an unkeyed 8-bit lookup table known as the Cave-Table, all operations are performed using 8-bit arithmetic.

Table 1: Cave

$x \setminus T(x)$	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
0	49	23	5f	e6	ca	68	97	30	7b	22	0c	34	11	a5	84	4e
1	0a	46	77	8d	10	9f	5e	42	f1	34	ec	a5	c9	b3	88	2b
2	59	47	a3	d2	ef	ae	64	ca	55	0b	7d	38	21	bc	96	00
3	49	56	25	15	97	e4	cb	6f	f2	70	3c	88	ba	d1	04	ae
4	e2	38	ba	44	9f	63	5d	1c	4a	ab	c7	65	f1	76	09	20
5	86	bd	0a	f1	3c	a7	29	93	cb	45	5f	48	10	74	62	8a
6	b8	77	80	d1	12	26	ac	64	e9	cf	f3	54	3a	0b	95	4a
7	b1	30	a4	96	16	57	49	8a	05	1f	62	7c	c3	2b	da	ed
8	b6	86	04	7a	97	13	6c	4a	51	30	e5	f2	2f	88	c4	a9
9	91	76	f0	17	43	38	29	84	a2	0b	4f	65	5a	ca	04	bc
a	e7	fa	88	81	6f	00	14	42	25	7c	5d	c9	9a	36	33	ab
b	5a	6f	9b	d9	fa	71	44	c5	37	a2	88	2d	00	b6	13	ec
c	4e	96	a8	5a	b5	47	c3	8d	3f	f2	ec	04	60	71	1b	29
d	04	79	a3	c7	1b	66	91	4a	25	9d	6c	5f	3a	30	f8	a2
e	91	34	f6	5c	67	69	79	05	22	aa	cb	ee	bf	18	80	4d
f	f5	36	ae	01	2f	94	c3	48	8b	bd	58	12	e0	77	6c	da

We now provide a specification of CMEA. The algorithm encrypts an n -byte message $P_{0\dots n-1}$ to a cipher text $C_{0\dots n-1}$ under the key $K_{0\dots}$ as follows:

```

 $y_0 \leftarrow 0$ 
for  $i \leftarrow 0, \dots, n-1$ 
   $P'_i \leftarrow P_i + T(y_i \otimes i)$ 
   $y_{i+1} \leftarrow y_i + P'_i$ 
for  $i \leftarrow 0, \dots, \lfloor n/2 \rfloor - 1$ 
   $P''_i \leftarrow P'_i \otimes (P'_{n-1-i} \vee 1)$ 
 $z_0 \leftarrow 0$ 
for  $i \leftarrow 0, \dots, n-1$ 
   $z_{i+1} \leftarrow z_i + P''_i$ 
   $C_i \leftarrow P''_i - T(z_i \otimes i)$ 

```

Here all operations are byte-wide arithmetic: $+$ and $-$ are addition and subtraction modulo 256, \otimes represents a logical bitwise exclusive or, \vee represents a logical bitwise or, and the keyed T function is as described previously.

Attacks on CMEA

- A chosen-plaintext attack
- A known-plaintext attack

Why is CMEA weak?

We have already made some observations in Section-2 regarding CMEA. There we pointed out some of the weaknesses in the algorithm. It should be noted that some of the properties lead to the successful breaking of the cipher, whereas others, though they give away some information do not contribute to the success of the two types of attacks given in Section 2. First let us consider the properties that lead to the successful cryptanalysis of the cipher.

Property

If the plaintext is of the form:

$$P = \{1-x, 1-x, \dots, 1-x\}$$

and the cipher-text is of the form :

$$C = \{-x, \dots\}$$

Then there is a very high probability that $T(0)=x$, where $T(i)$ is the output of the T-Box corresponding to input 'i'.

Analysis

$$P'_0 = P_0 + T(0) = 1 - x + T(0).$$

If $T(0) = x$, we have $P'_0 = 1$

$$\text{Thus, } y_1 = y_0 + P'_0 = 0 + 1 = 1$$

Likewise,

$$P'_1 = P_1 + T(1 \oplus 1) = 1 - x + T(0),$$

If $T(0) = x$, we have $P'_1 = 1$

$$\text{Thus, } y_2 = y_1 + P'_1 = 1 + 1 = 2.$$

Thus continuing we have

$$P'_{n-1} = 1$$

$$P'' = P'_0 \oplus (P'_{n-1} \vee 1) = 1 \oplus 1 = 0$$

Hence,

$$C_0 = P''_0 - T(0) = -T(0) = -x$$

The probability when using the Cave-Table is dependent on the fact that the initial guess for $T(0)$ is correct and the possible number of trails is thus only $(256-92)/2 = 82$ on the average.

Property

If the plaintext is of the form:

$$P = \{1-T(0), 1-T(0), \dots, 1-T(0), k-T(0), 0\}$$

and the ciphertext is

$$C = \{t-T(0), \dots\},$$

where $k = ((n-1) \oplus j) - (n-2)$, then there is a very high probability that $t = T(j)$.

Analysis:

It has been shown that $P'_i = 1$ and $y_{i+1} = (i+1)$,

where $0 \leq i \leq (n-3)$.

$$\begin{aligned} \text{Now } P'_{n-2} &= P_{n-2} + T(y_{n-2} \oplus n-2) \\ &= P_{n-2} + T(0), \text{ since } y_{n-2} = n-2 \\ &= k - T(0) + T(0) = k \end{aligned}$$

Using this fact,

$$\begin{aligned} y_{n-1} &= y_{n-2} + P'_{n-2} \\ &= (n-2) + k \\ &= (n-1) \oplus j. \end{aligned}$$

Therefore,

$$\begin{aligned} P'_{n-1} &= P_{n-1} + T(y_{n-1} \oplus (n-1)) \\ &= 0 + T(j). \end{aligned}$$

Thus, $C_0 = t - T(0) = P'_{n-1} - T(0)$

$$= P'_{n-1} \oplus (P'_{n-1} \vee 1) - T(0)$$

$$\text{Thus, } t = 1 \oplus (T(j) \vee 1)$$

$= T(j)$, with very high probability, with some confusion in the LSB.

Property

The CMEA algorithm uses a very skewed Cave-Table [2]. The Cave-Table is not a permutation and 92 of the 256 values never occur. The Cave-Table was shown in Section 1. The frequency distribution of the Cave-Table entries is given in figure1.

Figure 1: frequency distribution of Cave-Table

We see that some of the values occur as many as 3 and 4 times. For every repeated value some value has to be missing. This property of the Cave-Table considerably reduces the number of plain texts needed in both the attacks given in Section 2.

Property

The CMEA algorithm uses a four round T-Box which can be subjected to a meet in the middle attack [3].

Property

The Least Significant Bit of the cipher-text is always the complement of the Least Significant Bit of the plaintext. i.e. one bit always leaks.

Analysis

Using original CMEA algorithm we get:

$$C_0 = ((P_0 + T(0)) \oplus (P'_2 \text{ OR } 1)) - T(0)$$

Truth table is given in Table-1

Consider LSB's: As far as $(P(0)+T(0))$'s LSB is concerned it is an equivalent exclusive or operation on $P(0)$ and $T(0)$'s LSB's (neglecting carry). The LSB output can be obtained as shown in Table-1. We see that the LSB of cipher-text is always the complement of the LSB of plaintext,

Property

The T-Box has some Key-Equivalence classes. As mentioned in Section 2.2, simultaneously complementing the Most Significant Bits of K_{2i} and K_{2i+1} for $i = 0, 1, 2$ leaves the action of the T-Box unchanged. This reduces the key length of the CMEA to 60 bits instead of 64 bits since we can assume the Most Significant Bits of K_0, K_2, K_4 and K_6 to all be 0 or 1.

Analysis

In the T-Box Function:

$$T(X) = C(\dots(C(\dots(C((X \oplus K_0) + K_1) + X) \oplus K_2) + K_3) + X) \oplus K_4) + K_5) + X,$$

consider the function : $f(X) = ((X \oplus K_0) + K_1)$. Let us consider the Most Significant Bits of all the three terms. In order to consider the effect of the other Least Significant Bits., we include a carry term which can be zero or one. The invariance after simultaneous complementing the Most Significant Bits of the pairs of keys is because the carry is not being accounted for. In $f(x)$, the MSB is being neglected. This can be seen from the Table 2. In case of both $a1$ and $a2$ after complementing the Most Significant Bits of K_0 and K_1 the difference is in the New Carry which is being neglected irrespective of the Carry (which is due the other less significant bit operations).

ANALYSIS OF THE PROPERTIES

Using the above properties one can explain why the CMEA algorithm is weak against the chosen plaintext and the known plain text attacks. The causes of the attacks are enlisted below:

- *Chosen Plain Text Attack*: The CMEA is weak against this attack because of properties 1 and 2 (and to an extent property 3).
- *Known Plain Text Attack*: The CMEA is weak against this attack because of properties 3 and 4.

Properties 5 and 6 give away some information to the attacker which though not used in the cryptanalysis of the algorithm as described in Section 3.1-3.6, can be possible weak points of the algorithm. The next section deals with ways of overcoming some of these weaknesses in the CMEA.

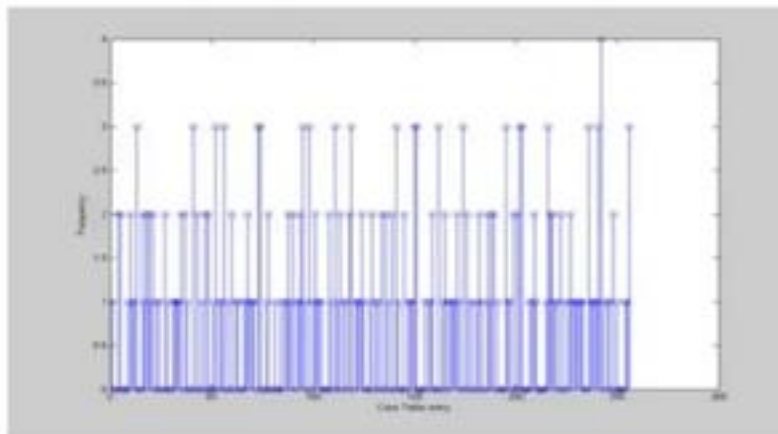


Fig. 1

MODIFIED CELLULAR MESSAGE ENCRYPTION ALGORITHM

Introduction

In this section the weaknesses that are given in Section 3 will be removed by elimination their causes as identified in Section 3.1-3.6. Each property that causes a dent in the CMEA's weakness will be dealt with so that none of the attacks that have been described in Section 3 work against the algorithm. In addition, ways to deal with some of the properties that could be weak points in the CMEA but are not used explicitly in the two attacks are also covered in this section.

Modifications in the CMEA

In this section the modifications needed in the CMEA corresponding to each of the Properties identified in above Section are presented.

Modification

The update equation of P' needs to be changed so that Properties 1 and 2 do not work. Thus the modified equation is of the form:

$$P'_i = P_i + T(y_i \oplus f(i,n))$$

such that as we vary i from 0 to $n-1$ (where n is the number of byte blocks in the plaintext) the T-Box is not predictably accessed. In the original CMEA property 1 exists because for a particular nature of the input plaintext and the key the T-Box was always referred at the point 0. So, the function $f(i,n)$ should be such that the T-Box is accessed at

Resurging India—Myths & Realities

Organised by



College of Management & Computer Applications

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, NH-24 Moradabad-244001, U.P., India

Excel
INDIA PUBLISHERS

EXCEL INDIA PUBLISHERS
NEW DELHI

management and integration with grid system. There are some of the issues like secure multicasting and secure sensor grids may not be applicable immediately. The network security assumes importance in Grid computing context mainly because of two reasons.

Firstly, due to typical requirements of grid system viz., the heterogeneity and high speed networks. Secondly, there are issues which are challenging security issues in the area of generic network.

The issues involved are:

- Routing
- Multicasting
- Sensor grids

EXPERIMENTAL STUDY

Firewalls or VPN's between the user's host and the server host, or between different server hosts present a serious challenge to Grid security measures. Grids that span administrative sites and encourage the dynamic addition of resources are not likely to benefit from the security that static, centrally administered commercial firewalls or VPN's provide. On the contrary, Grids need to enforce their own security and a firewall is likely to prevent Grid-authorized accesses. Typically firewalls only allow access from or to specific hosts and to specific ports. The Grid infrastructure servers can be configured to run on known ports which can be allowed by the firewalls. User provided servers and code tend to be more unpredictable in their port usage and it may not be possible to run them on hosts that are behind firewalls. Also jobs that are scheduled to run on the "best" set of hosts may break if the request does not arrive from an allowed host.

VPN's usually require some specific authentication and authorization in order to make a connection. Some VPN's support x509 identity certificates for authorization and might be able to use Grid IDs. Such a VPN might present a way to get through firewalls and allow the standard Grid access control to work.

Purpose of Firewalls

Security

The most important why most companies have firewalls installed is to ensure security in the network. Many companies do port level or packet level filtering to prevent the network from security attacks.

Enforce policies

Firewalls are one of the easiest means to ensure policies. For example a company may not allow employees from accessing FTP servers. Most of the modern firewall allows more complex policies to be employees where evaluation of network packets not only happens at the network or transport level but also at the application layer.

Auditing

Another important reason why firewalls have become ubiquitous as they can monitor traffic and provide audit trails. These become very good source of information in case of security breach. General setup of firewall in wide area networks.

Firewalls and Web Services

To integrate firewalls with web service we have to consider the following issues.

Flexibility

Firewalls place some constraints and reduce the ease for the home users especially in case of asynchronous message processing. This makes an assumption that SOAP server server/listener need to be installed in home machine over the internet would be able to send message through the home user's firewall. This reduces flexibility of design lead to concept of WS-polling.

Effectiveness

With the growth of web services and XML technologies the effectiveness of most of the third generation firewalls is under question. XML firewalls have the capability of examining an incoming SOAP request, and taking an application action based on the message content. Such content inspection is vital to prevent malicious as well as DOS attacks. Further XML firewalls can offer non reputation mechanisms by providing audit trails of all service accesses.

Coordination

Peer to peer interactions between web services which are behind firewalls introduces problems as the endpoints are inaccessible. Several solutions have been proposed to address this issue. It can be solved by implementing a solution

different points. After considering several forms of the function $f(i,n)$ the proposed function is $f(i,n) = 2i\%n$, hence the update equation becomes:

$$P'_i = P_i + T(y_i \oplus 2i \% n)$$

Thus the algorithm is transferred to:

```

y0 = 0
for(i = 0; i < n; i++)
{
    P'_i = P_i + T(y_i \oplus 2i\%n)
    y_{i+1} = y_i + P'_i
}

for(i = 0; i < \lfloor n/2 \rfloor; i++)
    P''_i = P'_i \oplus (P'_{n-i-1} \vee 1)

z0 = 0
for(i = 0; i < n; i++)
{
    z_{i+1} = z_i + P''_i
    C_i = P''_i - T(z_i \oplus 2i\%n)
}

```

Modification

The Cave-Table is replaced with the Advanced Encryption Standard's (AES) S-Box which can be efficiently implemented. Thus the distribution is no more skewed and all the possible 256 values appear as a possibility.

After modifications 1 and 2 the Chosen Plain text attack is nullified and the Known Plain text attack is also evaded easily.

The number of plaintexts grows exponentially with the number of blocks. For an n byte block the number of chosen plaintexts is of the order of 256^n . Thus the number of plaintexts to be investigated is equal to that in a brute force search on the entire plaintext space. Such a large number of plaintext requirements make the attack ineffective against the modified CMEA.

As the Cave-Table has been replaced by the AES S-Box the skewness of the Cave-Table no longer exists. All of the 256 values may appear.

Modification

The T-Box previously had only four rounds. The number of rounds in the T-Box has been increased to eight rounds to prevent meet-in-the-middle attack. For this purpose, the output of the four round T-Box is recycled again through the T-Box.

Modification

The or with 1 in the second stage of the CMEA is removed. This removes the property that the LSB of the cipher-text is always the complement of the LSB of the plaintext. This can be explained by using the modified version and resorting to its truth table.

Using the modified version: $C_0 = ((P_0 + T(0)) \oplus P'_0) - T(0)$

From the truth table (TABLE 3) we see that the Least Significant Bits of the plaintext and the cipher text are no longer related.

Table 2: Truth Table for LSB of P0

P_0	T_0	$(P_0 + T_0) \oplus 1$	C_0
0	0	1	1
0	1	0	1
1	0	0	0
1	1	1	0

Modification

From Table 2 we saw that by complementing the Most Significant Bits of K_0 and K_1 or a similar pair of odd and even keys, the output does not change. However the Carry out in the 2 cases is different. In order to incorporate the effect of the carry from the MSB, it was exclusive or-ed with the Least Significant Bit of the resultant $f(X)$. The Truth Table showing the carry over is given in Table 4.

Table 3: Truth Table for MSB

	X	K0	K1	CARRY = 0		CARRY = 1	
				f(X)	f(X)		
a1	0	0	0	0	1		
	0	0	1	1	0		
	0	1	0	1	0		
a2	0	1	1	0	1		
	1	0	0	1	0		
	1	0	1	0	1		
	1	1	0	0	1		
	1	1	1	1	0		

Table 4: Truth Table for LSB of Plaintext and Cipher Text

P[0]	T[0]	P'[2]	(P[0] OR T[0]) XOR P'[2]	C[0]
0	0	0	0	0
0	0	1	1	1
0	1	0	1	0
0	1	1	0	1
1	0	0	1	1
1	0	1	0	0
1	1	0	0	1
1	1	1	1	0

Table 4: Truth Table with Carry Over

	X	K0	K1	CARRY = 0		CARRY = 1	
				f(X)	New Carry	f(X)	New Carry
a1	0	0	0	0	0	1	0
	0	0	1	1	0	0	1
	0	1	0	1	0	0	1
a2	0	1	1	0	1	1	1
	1	0	0	1	0	0	1
	1	0	1	0	1	1	1
	1	1	0	0	0	1	0
	1	1	1	1	0	0	1

For 50,000 random combination of data and keys, we get the average number of changes in cipher texts (byte wise) by simultaneously changing the Most Significant Bits of all four pairs of Equivalence Class Keys as approximately 99.5 % as opposed to 0% of the times earlier.

MODIFICATIONS TO BE KEPT

It was mentioned that the fourth and fifth modifications in the CMEA did not contribute towards preventing the Chosen plain text and the Known Plain text attacks. So it was decided to not include these changes while performing dedicated cryptanalysis of the new algorithm so as to not change the algorithm more than absolutely necessary.

In a nutshell, the first three modifications are absolutely necessary in order that the CMEA's use in CDMA2000 systems is continued without compromising with the customer's privacy, while the other modifications might be used in case an attack exploiting these properties is devised in the future. Also, since we have carried out dedicated cryptanalysis of the modified algorithm, we ourselves have checked that the properties do not make the cipher insecure. A reduction in the Key set from 2^{64} to 2^{60} does not make much difference practically and by knowing the Least Significant Bit of the cipher text and hence the plaintext the attacker will not be able to break the algorithm.

CONCLUSION

In the present paper the original CMEA algorithm has been modified into M-CMEA. Research work is going to find out causes of weakness in CMEA, and their customization through some newly defined properties. It will describe several possible properties that lead to the successful cryptanalysis of the cipher. Although there could be other possible weakness in CMEA, at a minimum, those properties will illuminate fundamental certification weaknesses in CMEA. Then the modification of CMEA will give us new refined version. It can be made strong and hence can be suitable for wireless security.

REFERENCES

- [1] Chardin, Thomas and Marinier, Raphael, (sep. 2009), "Improved Cellular Message Encryption Algorithm," *International Journal of Network Security*, vol.9, no.2, pp.173-179.
- [2] Mukhopadhyay, D. and Roychowdhury, D., Sep.,(2008), "Customizing cellular message encryption algorithm," *International journal of Network Security*, vol. 7, no.2, pp. 194-202.
- [3] Wagner, D., Schneier, B., and Kelsey, J., (1997), "Cryptanalysis of the cellular message encryption algorithm," *Proceedings of the Annual International Cryptology Conference*, pp. 526537.
- [4] TTA telecommunication Industry Association, Common Cryptographic Algorithms, Revision D.1, Publication Version, Sept., (2003).

Binary Matrix based Similarity and Dissimilarity of Classes

Bharti Chhabra¹ and Sunil Kumar²

^{1,2}Research Scholar, Haryana Engineering College, Research Scholar, Jagadhri Thapar University, Patiala

Abstract – Clustering provides a way to easily retrieve the software components. There are many clustering techniques available but choosing the right kind of clustering depends upon the type of data. We have developed a class clustering technique which focuses on the clustering of the classes on the basis of similarity and dissimilarity measures. This measure can be further analyzed from class attributes and methods. The classes are taken from the logical view of the software Rational ROSE which is an IBM modeling tool. Further a binary matrix has been developed which emphasizes on the presence and absence of class attributes and methods. Our approach resulted in the clustering of the classes on the basis of similarity and dissimilarity measures.

Keywords: Clustering, UML, Binary Matrix.

INTRODUCTION

Software Design is one of the crucial parts in software development. It needs in depth analysis so that further delays can be avoided. Software development can be enhanced if it is integrated with the concept of reusability [5]. Reusability enhances the development in terms of time cost and effort. There are some factors on which reusability depends one such factor is the availability of the component to be reused. This availability can be further enhanced if the components are grouped or clustered on the basis of some parameters like similarity or dissimilarity measures. In our approach we are clustering the classes on the basis of attributes, methods and relationships. The class diagram we are using is taken from the logical view in the Rational ROSE. Rational ROSE is a modeling tool of IBM. There are other views like use-case view, component view and deployment view [10] in Rational ROSE [9]. The logical view or static view has been mapped from the use-case view. After analyzing the logical view in terms of class name, attributes, methods and relationship between classes, a binary matrix has been formed. This matrix indicates the absence and presence of attribute, methods and relationship amongst the various classes. Further a dissimilarity measure has been calculated justifying the degree of dissimilarity among classes.

LITERATURE SURVEY

R. Ibbá et al [8] has emphasized on the design based reuse of software components. The approach has used a set of metrics to create clusters of existing components on the basis of their similar internal structure and also performed functional similarity checks. **Yves Chiricota** et al [14] has described a method for determining clusters of software systems. The author has applied a straight forward metric which is used to find out the weak edges. The deletion of weak edges resulted into several components. The quality metric MQ has also been used. **Xie Binhong** et al [13] has used Grade strategy to assign a grade weight to each facet and has proposed a component clustering algorithm. The comparison of Vector space model and latent semantic analysis for component clustering is shown. The technique defines that the quality of component classification can be

improved using Grade strategy. **Chung-Hong Lung** et al [2] has defined a technique based on cohesion and coupling information of a software system and has applied it to real time software system in telecom and computer networks. **Shi Zhong** et al [12] has described a technique for unifying bipartite graph view of probabilistic model based clustering and has also analyzed the model based partition clustering mathematically from a deterministic annealing perspective. The approach has also discussed two new variations balanced model clustering and hybrid model based clustering. **Istvan Gergely Czibula** et al [6] has defined an approach for clustering using refactoring which helps in improving the internal structure without affecting the external structure. A new k-means based clustering approach (CARD) is also proposed.

METHODOLOGY

Our approach follows the process view given below:



Fig. 1: Process View

Modeling software requires various views to be modeled into a modeling tool. We have Rational ROSE [9] as a modeling tool and logical view as the origin from which the data is to be clustered. Logical view consists of a class diagram which further includes class name, its attributes, methods and relationship amongst the various classes. On the basis of presence and absence of attributes, methods and relationship a binary matrix has been formed. We have tried to justify our



Fig. 2: Class Diagram

After analyzing the above diagram the binary matrix is shown below:
 Technique with the help of an example as below:

Table 1: Binary Matrix

	AT1	AT2	AT3	AT4	AT5	M1	M2	M3	M4	M5	M6	M7	M8	M9
C1	1	1	0	0	0	1	1	0	0	0	0	0	0	0
C2	0	0	0	0	0	0	0	1	0	0	0	0	0	1
C3	0	0	1	1	0	0	0	0	1	1	0	0	0	1
C4	0	0	0	0	0	0	0	0	0	0	1	0	0	1
C5	0	0	0	0	1	0	0	0	0	0	0	1	1	1

In the fig:
 AT1...AT5 denote the attributes of classes C1...C5
 M1...M9 denote the methods of classes C1...C5
 Now apply the similarity measure [7]

$$S_{min} = \frac{J_{ij(i=j)}}{J_{ij(i=0,j=1)} + J_{ij(i=1,j=0)} + J_{ij(i=j)}}$$

Where S_{min} is the similarity measure
 J_{ij} is a binary variable.

After calculation and analysis we get the following similarity matrix

SIMILARITY MATRIX

Table 2: Similarity Matrix

	(C1)	(C2)	(C3)	(C4)	(C5)
(C1)	1	0	0	0	0
(C2)	0	1	18	33	2
(C3)	0	18	1	88	12
(C4)	0	33	18	1	2
(C5)	0	2	12	2	1

Analysis from the above matrix result into

- The similarity between the same classes comes out to be 1; it means if two classes are equally similar in terms of attributes and methods then their value comes out to be 1.
- The dissimilarity can be calculated by subtracting the similarity from 1.
- The relationship between the classes like association, aggregation and generalization do not play any significant role.

DISSIMILARITY MATRIX

Table 3: Dissimilarity Matrix

	(C ₁)	(C ₂)	(C ₃)	(C ₄)	(C ₅)
(C ₁)	1	1	1	1	1
(C ₂)	1	0	.34	.67	.3
(C ₃)	1	.34	0	.34	.38
(C ₄)	1	.67	.34	0	.3
(C ₅)	1	.3	.38	.3	0

Results

Cluster 1

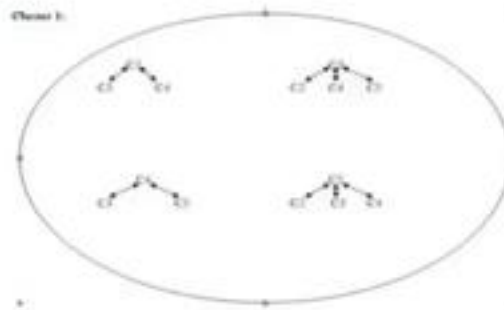


Fig. 3: Cluster 1(Dmm = 0.8)

Cluster 2

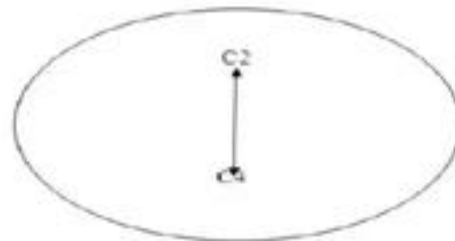


Fig. 4: Cluster 2(Dmm=0.67)

Cluster 3

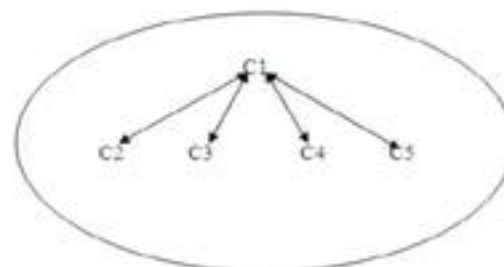


Fig. 5: Cluster 3(Dmm=1)

CONCLUSION

From the above analysis of similarity and dissimilarity matrix it has been concluded that clustering of classes depends upon the similarity and dissimilarity of attributes and methods. The relationship between the classes contributes very less towards similarity and dissimilarity evaluation. Our approach describes a way to cluster the components having attributes or characteristics.

FUTURE SCOPE

Our approach has provided a way to cluster the class components. However there are other components also which have attributes. Hence this approach can be used for other UML components. Also if we look after the type of classes like interface, entity and control class then they can also play a significant role in identifying the similarity and dissimilarity between class components.

REFERENCES

- [1] Egyed, Alexander, (2007), "UML Analyzer: A tool for Consistency Checking of UML models," Proceedings of the 29th International Conference on Software Engineering (ICSE- 2007), Minneapolis, USA, May.
- [2] Lung, Chung-Hong, Nandi, Amit and Zaman, Marzia, (2002) "Applications of Clustering to Early Software Life Cycle phases," Proc. of Int'l Conf. on Software Eng. Research and Practice.
- [3] Yang, Chuangxin, Peng, Hong and Wang, Jiabing, (2008) "A clustering Algorithm for Weighted Graph Based on minimum Cut," First International Conference on Intelligent Networks and Intelligent Systems IEEE.
- [4] Booch, Grady, Jacobson, Ivar and Rumbaugh, Jim, (2000), OMG Unified Modeling Language Specification, Version 1.3 First Edition: March.
- [5] Haikuan, Li, Katwijk, Jan van and Levy, A.M., (1992), "The Reuse of Software Design and Software Architecture," IEEE.
- [6] Czibula, Istvan, Gergely, Serban, Gabriela, (2006), "Improving Systems Design Using a Clustering Approach," IJCSNS International Journal of Computer Science and Network Security, VOL.6 No.12, December.
- [7] Schulz, Jan, "Jaccard similarity," <http://code10.net/index.php?option=com_content&view=article&id=60:articlejaccard-similarity&catid=38:cat_coding_algorithms_data-similarity&Itemid=57>.
- [8] Ibba, R., Natale, D., Benedusi, P. and Naddei, R., (1993), "Structure-based Clustering of Components for Software Reuse" IEEE.
- [9] Rational Rose, (2008), <www.rational.com>.
- [10] Ibrahim, Rosziati and Ibrahim, Noraini, "A tool for checking the conformance of UML specification," <www.waset.org/journals/waset/v51/v51-45.pdf>.
- [11] Mili, Hamed, Mili, Ali, Yacoub, Sherif and Eddy, Edward, (2002), Reuse based Software Engineering, Book: John Wiley & Sons, Inc.
- [12] Zhong, Shi, Ghosh, Joydeep, (2003), "A Unified Framework for Model-based Clustering," Journal of Machine Learning Research4, 1001-1037.
- [13] Binhong, Xie, Yaopeng, Ren, Yingjun, Zhang and Lichao, Chen, (2010), "Research on the Clustering Algorithm of Component Based on the Grade Strategy," International Conference on Computer Application and System Modeling, (ICCSM).
- [14] Chiricota, Yves, Jourdan, Fabien and Melancon, Guy, (2003), "Software components capture using graph clustering," Proceedings of the 11th IEEE International Workshop on Program Comprehension (IWPC).

Effect of Association Rule in Data Mining

Sushma Rana¹, Wajid Ali² and Gulista Khan³

¹HITM, Ambala

^{2,3}TMU, Moradabad

Abstract—Business information received from advanced data analysis and data mining is a critical success factor for companies wishing to maximize competitive advantage. Data mining is a part of a process called KDD-knowledge discovery in databases. This process consists basically of steps that are performed before carrying out data mining, such as data selection, data cleaning, pre-processing, and data transformation. Association rule techniques are used for data mining if the goal is to detect relationships or associations between specific values of categorical variables in large data sets. There may be thousands or millions of records that have to be read and to extract the rules for, but the question is what will happen if there is new data, or there is a need to modify or delete some or all the existing set of data during the process of data mining. In the past user would repeat the whole procedure, which is time-consuming in addition to its lack of efficiency. From this, the importance of dynamic data mining process appears and for this reason this problem is going to be the main topic of this paper. Therefore the purpose of this study is to find solution for dynamic data mining process that is able to take into considerations all updates (insert, update, and delete problems) into account.

Keywords: Datamining, kDD, Associationrule, support, confidence, frequentitem sets, FP growth, Apriori algorithm, Zero-attribute rule

INTRODUCTION

Data mining is the task of discovering interesting and hidden patterns from large amounts of data where the data can be stored in databases, data warehouses, OLAP (on line analytical process) or other repository information [1]. It is also defined as knowledge discovery in databases (KDD) [2]. Data mining involves an integration of techniques from multiple disciplines such as database technology, statistics, machine learning, neural networks, information retrieval, etc [3]. According [4]: "Data mining is the process of discovering meaningful patterns and relationships that lie hidden within very large databases". Also [5] defines Data mining as "the analysis of observational data sets to find unsuspected relationships and to summarize the data in novel ways that are both understandable and useful to the data owner". Data mining is a part of a process called KDD-knowledge discovery in databases [3].

The basic Data Mining Tasks consists of a number of processes:

- Time series analysis: [5, 7, 8].
- Association analysis: [9].
- Classification: [3, 5, 8].
- Regression: [3, 5].
- Cluster analysis: [6, 8].
- Summarization: [5].

By the association algorithm we analyze the association rules and solve the problem of prediction of new pattern in Data Mining. We will see in which limit it is effective in Data Mining. The definition of association rule depend on three point views (1) support,(2) confidence, (3) interest. But association rule depends upon the frequent item sets. And frequent item sets depend upon the market basket analysis.

PROBLEM OF ASSOCIATION RULE MINING

Association mining that discovers dependencies among values of an attribute was introduced by Aggrawal et al.[1] and has emerged as an important research area. The problem of association mining, also referred to as the market basket problem, is formally defined as follows. Let $I = \{i_1, i_2, \dots, i_m\}$ be a set of items and $S = \{s_1, s_2, \dots, s_n\}$ be a set of transactions, where each transaction $s_i \in S$ is a set of items that is $s_i \subseteq I$. An association rule denoted by $X \Rightarrow Y$, $X, Y \subset I$, and $X \cap Y = \Phi$, describes the existence of a relationship between the two item sets X and Y .

Several measures have been introduced to define the strength of the relationship between item sets X and Y such as SUPPORT, CONFIDENCE, and INTEREST [1,2,5,7]. The definitions of these measures, from a probabilistic view point, are given below.

1. $SUPPORT(X \Rightarrow Y) = P(X, Y)$, or the percentage of transactions in the database that contain both X and Y .
2. $CONFIDENCE (X \Rightarrow Y) = P(X, Y) / P(X)$, or the percentage of transactions containing Y in those transactions containing X .
3. $INTEREST(X \Rightarrow Y) = P(X, Y) / P(X)P(Y)$ represents a test of statistical independence.

SUPPORT for an item set S is calculated as $SUPPORT (S) = \frac{F(S)}{F}$.

Where $F(S)$ is the number of transactions having S , and F is the total number of transactions.

For a minimum SUPPORT value MINSUP, S is a large (or frequent) item set if $SUPPORT(S) \geq MINSUP$, or $F(S) \geq F * MINSUP$.

Suppose we have divided the transaction set T into two subsets T_1 and T_2 , corresponding to two consecutive time intervals, where F_1 is the number of transactions in T_1 and F_2 is the number of transactions in T_2 , ($F = F_1 + F_2$), and $F_1(S)$ is the number of transactions having S in T_1 and $F_2(S)$ is the number of transactions having S in T_2 , ($F(S) = F_1(S) + F_2(S)$). By calculating the SUPPORT of S, in each of the two subsets, we get

$$SUPPORT_1(S) = \frac{F_1(S)}{F_1} \text{ and } SUPPORT_2(S) = \frac{F_2(S)}{F_2}$$

S is a large itemset if

$$\frac{F_1(S) + F_2(S)}{F_1 + F_2} \geq MINSUP, \text{ or}$$

$$F_1(S) + F_2(S) \geq (F_1 + F_2) * MINSUP$$

In order to find out if S is a large itemset or not, we consider four cases,

- S is a large itemset in T_1 and also a large itemset in T_2 , i.e., $F_1(S) \geq F_1 * MINSUP$ and $F_2(S) \geq F_2 * MINSUP$.
- S is a large itemset in T_1 but a small itemset in T_2 , i.e., $F_1(S) \geq F_1 * MINSUP$ and $F_2(S) < F_2 * MINSUP$.
- S is a small itemset in T_1 but a large itemset in T_2 , i.e., $F_1(S) < F_1 * MINSUP$ and $F_2(S) \geq F_2 * MINSUP$.
- S is a small itemset in T_1 and also a small itemset in T_2 , i.e., $F_1(S) < F_1 * MINSUP$ and $F_2(S) < F_2 * MINSUP$.

In the first and fourth cases, S is a large itemset and a small itemset in transaction set T, respectively, while in the second and third cases, it is not clear to determine if S is a small itemset or a large itemset. Formally speaking, let $SUPPORT(S) = MINSUP + \delta$, where $\delta \geq 0$ if S is a large itemset, and $\delta < 0$ if S is a small itemset. The above four cases have the following characteristics,

- $\delta_1 \geq 0$ and $\delta_2 \geq 0$
- $\delta_1 \geq 0$ and $\delta_2 < 0$
- $\delta_1 < 0$ and $\delta_2 \geq 0$
- $\delta_1 < 0$ and $\delta_2 < 0$

S is a large itemset if

$$\frac{F_1 * (MINSUP + \delta_1) + F_2 * (MINSUP + \delta_2)}{F_1 + F_2} \geq MINSUP, \text{ or}$$

$$F_1 * (MINSUP + \delta_1) + F_2 * (MINSUP + \delta_2) \geq MINSUP * (F_1 + F_2)$$

which can be written as $F_1 * \delta_1 + F_2 * \delta_2 \geq 0$

Generally, let the transaction set T be divided into n transaction subsets T_i 's, $1 \leq i \leq n$. S is a large itemset if $\sum_{i=1}^n F_i * \delta_i \geq 0$, where F_i is the number of transactions in T_i and $\delta_i = SUPPORT_i(S) - MINSUP$, $1 \leq i \leq n$. $-MINSUP \leq \delta_i \leq 1 - MINSUP$, $1 \leq i \leq n$.

For those cases where $\sum_{i=1}^n F_i * \delta_i < 0$, there are two options, either

- Discard S as a large itemset (a small itemset with no history record maintained), or
- Keep it for future calculations (a small itemset with history record maintained). In this case, we are not going to report it as a large itemset, but its $\sum_{i=1}^n F_i * \delta_i$ formula will be maintained and checked through the future intervals.

With example we are defining this problem

Table 1: Example Data Base with 4 Items and 5 Transactions

Transaction ID	Milk	Bread	Butter	Beer
1	1	1	0	0
2	0	0	1	0
3	0	0	0	1
4	1	1	1	0
5	0	1	0	0

Following the original definition by Agrawal et al. [11] the problem of association rule mining is defined as: Let $I = \{i_1, i_2, \dots, i_m\}$ be a set of n binary attributes called items. Let $D = \{t_1, t_2, \dots, t_m\}$ be a set of transactions called the database. Each transaction in D has a unique transaction ID and contains a subset of the items in I . A rule is defined as an implication of the form $X \Rightarrow Y$ where $X, Y \subseteq I$ and $X \cap Y = \emptyset$. The sets of items (for short item sets) X and Y are called antecedent (left-hand-side or LHS) and consequent (right-hand-side or RHS) of the rule respectively.

To illustrate the concepts, we use a small example from the supermarket domain. The set of items is $I = \{\text{milk, bread, butter, beer}\}$ and a small database containing the items (1 codes presence and 0 absence of an item in a transaction) is shown in the table to the right. An example rule for the supermarket could be $\{\text{butter, bread}\} \Rightarrow \{\text{milk}\}$ meaning that if butter and bread is bought, customers also buy milk.

USEFUL CONCEPTS

To select interesting rules from the set of all possible rules, constraints on various measures of significance and interest can be used. The best-known constraints are minimum thresholds on support and confidence.

- The support $\text{supp}(X)$ of an itemset X is defined as the proportion of transactions in the data set which contain the itemset. In the example database, the itemset $\{\text{milk, bread, butter}\}$ has a support of $1 / 5 = 0.2$ since it occurs in 20% of all transactions (1 out of 5 transactions).
- The *confidence* of a rule is defined $\text{conf}(X \Rightarrow Y) = \frac{\text{supp}(X \cup Y)}{\text{supp}(X)}$. For example, the rule $\{\text{milk, bread}\} \Rightarrow \{\text{butter}\}$ has a confidence of $0.2 / 0.4 = 0.5$ in the database, which means that for 50% of the transactions containing milk and bread the rule is correct.
- Confidence can be interpreted as an estimate of the probability $P(Y | X)$, the probability of finding the RHS of the rule in transactions under the condition that these transactions also contain the LHS.[12]
- The *lift* of a rule is defined as $\text{lift}(X \Rightarrow Y) = \frac{\text{supp}(X \cup Y)}{\text{supp}(Y) \times \text{supp}(X)}$ or the ratio of the observed support to that

expected if X and Y were independent. The rule $\{\text{milk, bread}\} \Rightarrow \{\text{butter}\}$ has a lift of $\frac{0.2}{0.4 \times 0.4} = 1.25$.

- The *conviction* of a rule is defined as $\text{conv}(X \Rightarrow Y) = \frac{1 - \text{supp}(Y)}{1 - \text{conf}(X \Rightarrow Y)}$. The

rule $\{\text{milk, bread}\} \Rightarrow \{\text{butter}\}$ has a conviction of $\frac{1 - 0.4}{1 - 0.5} = 1.2$, and can be interpreted as the ratio of the

expected frequency that X occurs without Y (that is to say, the frequency that the rule makes an incorrect prediction) if X and Y were independent divided by the observed frequency of incorrect predictions. In this example, the conviction value of 1.2 shows that the rule $\{\text{milk, bread}\} \Rightarrow \{\text{butter}\}$ would be incorrect 20% more often (1.2 times as often) if the association between X and Y was purely random chance.

- The property of *succinctness* (Characterized by clear, precise expression in few words) of a constraint. A constraint is succinct if we are able to explicitly write down all Item-sets, that satisfy the constraint. Example: Constraint $C = \text{S.Type} = \{\text{NonFood}\}$ Products that would satisfy this constraint are for ex. $\{\text{Headphones, Shoes, Toilet paper}\}$ Usage Example: Instead of using Apriori algorithm to obtain the Frequent-Item-sets we can instead create all the Item-sets and run support counting only once.

PROCESS

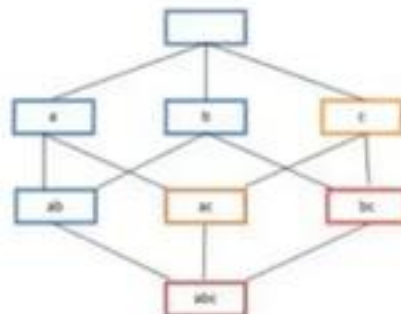


Fig. 1: Frequent Itemset Lattice

Frequent itemset lattice, where the color of the box indicates how many transactions contain the combination of items. Note that lower levels of the lattice can contain at most the minimum number of their parents' items; e.g. {ac} can have only at most $\min(a, c)$ items. This is called the *downward-closure property*.^[11]

Association rules are usually required to satisfy a user-specified minimum support and a user-specified minimum confidence at the same time. Association rule generation is usually split up into two separate steps:

1. First, minimum support is applied to find all frequent itemsets in a database.
2. Second, these frequent itemsets and the minimum confidence constraint are used to form rules.

While the second step is straight forward, the first step needs more attention.

Finding all frequent itemsets in a database is difficult since it involves searching all possible itemsets (item combinations). The set of possible itemsets is the power set over I and has size $2^n - 1$ (excluding the empty set which is not a valid itemset). Although the size of the powerset grows exponentially in the number of items n in I , efficient search is possible using the downward-closure property of support [11][13] (also called anti-monotonicity [14]) which guarantees that for a frequent itemset, all its subsets are also frequent and thus for an infrequent itemset, all its supersets must also be infrequent. Exploiting this property, efficient algorithms (e.g., Apriori [15] and Eclat [16]) can find all frequent item sets.

Next to confidence also other measures of interestingness for rules were proposed. Some popular measures are:

- All-confidence [19]
- Collective strength [20]
- Conviction [21]
- Leverage [22]
- Lift (originally called interest) [23]

A definition of these measures can be found here. Several more measures are presented and compared by Tan et al. [23] Looking for techniques that can model what the user has known (and using this models as interestingness measures) is currently an active research trend under the name of "Subjective Interestingness".

ALGORITHMS

Many algorithms for generating association rules were presented over time. Some well known algorithms are Apriori, Eclat and FP-Growth, but they only do half the job, since they are algorithms for mining frequent itemsets. Another step needs to be done after to generate rules from frequent itemsets found in a database.

Apriori Algorithm

Apriori [15] is the best-known algorithm to mine association rules. It uses a breadth-first search strategy to counting the support of itemsets and uses a candidate generation function which exploits the downward closure property of support. The Apriori Algorithm: Pseudo code

- Join Step: C_k is generated by joining L_{k-1} with itself
- Prune Step: Any $(k-1)$ -itemset that is not frequent cannot be a subset of a frequent k -itemset
- Pseudo-code:

```

Ck: Candidate itemset of size k
Lk: frequent itemset of size k
L1 = {frequent items};
for(k = 1; Lk != ∅; k++) do begin
  Ck+1 = candidates generated from Lk;
  for each transaction t in database do
    increment the count of all candidates in Ck+1 that are contained in t
  Lk+1 = candidates in Ck+1 with min_support
end return ∪k Lk;

```

Brief explanation of Apriori Algorithm

- Step 1: Generating 1-itemset Frequent
 - Step 2: Generating 2-itemset Frequent Pattern
 - Step 3: Generating 3-itemset Frequent Pattern
 - Step 4: Generating 4-itemset Frequent Pattern
 - Step 5: Generating Association Rules from Frequent Item sets
- Methods to improve

Apriori's Efficiency

- Hash-based itemset counting: A k -itemset whose corresponding hashing bucket count is below the threshold cannot be frequent.
- Transaction reduction: A transaction that does not contain any frequent k -itemset is useless in subsequent scans.
- Partitioning: Any item set that is potentially frequent in DB must be frequent in at least one of the partitions of DB.
- Sampling: mining on a subset of given data, lower support threshold + a method to determine the completeness.
- Dynamic itemset counting: add new candidate itemsets only when all of their subsets are estimated to be frequent.

similar to post office mailbox. A web service client with no endpoint creates a mailbox and then uses this mailbox address when it needs to receive messages. When the client is ready it can check the mailbox service for new messages and download them for processing.

CONCLUSION

Grid computing presents a number of security challenges that are met by the Globus Toolkit's Grid Security Infrastructure (GSI). Version 3 of the Globus Toolkit (GT3) implements the emerging Open Grid Services Architecture; its GSI implementation (GSI3) takes advantage of this evolution to improve on the security model used in earlier versions of the toolkit. GSI3 remains compatible (in terms of credential formats) with those used in GT2, while eliminating privileged network services and making other improvements. Its development provides a basis for a variety of future work. In particular, we are interested in exploiting network security by improving firewall compatibility; in defining and implementing standard services for authorization, credential conversation, identity mapping.

REFERENCES

- [1] Luis Ferreira, Viktors Berstis, Jonathan Armstrong, Mike Introduction to Grid Computing with Globus.
- [2] Foster, I., Kesselman, C., Nick, J. and Tuecke, S., *The Physiology of the Grid: An Open Grid Services Architecture for Distributed Systems Integration Project*, 2002.
- [3] <<http://www.globus.org/research/papers/ogsa>> pdf.
- [4] Foster, I., Kesselman, C., Tsudik, G. and Tuecke, S. *A Security Architecture for Computational Grids*. ACM Conference on Computers and Security, 1998, 83-91.
- [5] Grid computing security by Anirban chakrabarti
- [6] The Globus Toolkit 3.0 Alpha Release, 2003 <<http://www.globus.org/ogsa/releases/alpha/index.html>.

Eclat Algorithm

Eclat[16] is a depth-first search algorithm using set intersection. Let the node at which we are starting be called the initial node. Let the distance of node Y be the distance from the initial node to Y. Dijkstra's algorithm will assign some initial distance values and will try to improve them step by step.

1. Assign to every node a tentative distance value: set it to zero for our initial node and to infinity for all other nodes.
2. Mark all nodes except the initial node as unvisited. Set the initial node as current. Create a set of the unvisited nodes called the *unvisited set* consisting of all the nodes except the initial node.
3. For the current node, consider all of its unvisited neighbors and calculate their *tentative* distances. For example, if the current node A is marked with a distance of 6, and the edge connecting it with a neighbor B has length 2, then the distance to B (through A) will be $6+2=8$. If this distance is less than the previously recorded distance, then overwrite that distance. Even though a neighbor has been examined, it is not marked as *visited* at this time, and it remains in the *unvisited set*.
4. When we are done considering all of the neighbors of the current node, mark it as visited and remove it from the *unvisited set*. A visited node will never be checked again; its distance recorded now is final and minimal.
5. The next *current node* will be the node marked with the lowest (tentative) distance in the *unvisited set*.
6. If the *unvisited set* is empty, then stop. The algorithm has finished. Otherwise, set the unvisited node marked with the smallest tentative distance as the next "current node" and go back to step 3.

4. FP-growth Algorithm

FP-growth (frequent pattern growth)^[26] uses an extended prefix-tree (FP-tree) structure to store the database in a compressed form. FP-growth adopts a divide-and-conquer approach to decompose both the mining tasks and the databases. It uses a pattern fragment growth method to avoid the costly process of candidate generation and testing used by Apriori.

The algorithm is as follows:

For each attribute A:

For each value V of that attribute, create a rule:

1. count how often each class appears
2. find the most frequent class, c
3. make a rule "if A=V then C=c"

Calculate the error rate of this rule

Pick the attribute whose rules produce the lowest error rate.

Mining the FP-Tree by Creating Conditional (sub) pattern bases

Steps:

Step1: Start from each frequent length-1 pattern (as an initial suffix pattern).

Step2: Construct its conditional pattern base which consists of the set of prefix paths in the FP-Tree co-occurring with suffix pattern.

Step3: Then, Construct its conditional FP-Tree& perform mining on such a tree.

Step4: The pattern grows this achieved by concatenation of the suffix pattern with the frequent patterns generated from a conditional FP-Tree.

Step5: The union of all frequent patterns (generated by step 4).

Zero-Attribute Rule

The **zero-attribute rule**, or Zero R, does not involve any attribute in the condition part, and always returns the most frequent class in the training set. This algorithm is frequently used to measure the classification success of other algorithms.

A famous story about association rule mining is the "beer and diaper" story. A purported survey of behaviour of supermarket shoppers discovered that customers (presumably young men) who buy diapers tend also to buy beer. This anecdote became popular as an example of how unexpected association rules might be found from everyday data. There are varying opinions as to how much of the story is true.

Other Types of Association Mining

1. **Contrast set learning** is a form of associative learning. Contrast set learners use rules that differ meaningfully in their distribution across subsets.
2. **Weighted class learning** is another form of associative learning in which weight may be assigned to classes to give focus to a particular issue of concern for the consumer of the data mining results.

3. **K-optimal pattern discovery** provides an alternative to the standard approach to association rule learning that requires that each pattern appear frequently in the data. Mining frequent sequences uses support to find sequences in temporal data.
4. **Generalized Association Rules** hierarchical taxonomy (concept hierarchy) Quantitative Association Rules categorical and quantitative data. Interval Data Association Rules e.g. partition the age into 5-year-increment ranged Maximal Association Rules. Sequential Association Rules temporal data e.g. first buy computer, then CD Roms, then a webcam.

CONCLUSION

Data mining is a part of a process called KDD-knowledge discovery in databases. This process consists basically of steps that are performed before carrying out data mining, such as data selection, data cleaning, pre-processing, and data transformation. In the Data Mining Association rule techniques are used to detect relationships or associations between specific values of categorical variables in large data sets. Association rules depend upon the frequent item sets. So firstly we have to detect the frequent item set by the different methods as explained above in form of algorithms.

REFERENCES

- [1] Halkidi, Maria, "Quality assessment and Uncertainty Handling in Data Mining Process," <<http://www.edbt2000.unikonstanz.de/phd-workshop/papers/Halkidi.pdf>>.
- [2] Fayyad, U. M., Shapiro, G. P. and Smyth, P., "From Data Mining to Knowledge Discovery in Databases," 0738-4602-1996, AI Magazine (Fall 1996): 37-53.
- [3] Han, Jiawei, Kamber, Micheline, (2001), "Data Mining: Concepts and Techniques," Morgan Kaufmann Publishers, Champaign: CS497/JH.fall, <www.cs.sfu.ca/~han/DM_Book.html>.
- [4] Seidman, Claude, "Data Mining with Microsoft SQL Server 2000 Technical Reference," ISBN: 0-7356-1271-4, <amazon.com/Mining-Microsoft-Server-Technical-Reference/dp/0735612714>.
- [5] Hand, David, Mannila, Heikki and Smyth, Padhraic, (2001), "Principles of Data Mining", ISBN: 026208290 MIT Press, Cambridge, MA.
- [6] Crespo, Fernando, Weber, Richard. "A methodology for dynamic data mining based on fuzzy clustering," Fuzzy Sets and Systems 150 (2005) 267-284.
- [7] Papadimitriou, Sun, J. and Faloutsos, C., (2005), "Streaming Pattern Discovery in Multiple Time-Series," Proceedings of the 31st VLDB Conference, Trondheim, Norway, p697-708.
- [8] Gaber, Mohamed Medhat, Zaslavsky, Arkady and Krishnaswamy, Shonali, (2005), "Mining Data Streams: A Review," VIC3145, Australia, ACM SIGMOD Record Vol. 34, No. 2; June.
- [9] Two Crows Corporation, "Introduction to Data Mining and knowledge Discovery," ISBN: 1-892095-02-5.
- [10] Piatetsky-Shapiro, G., (1991), Discovery, analysis, and presentation of strong rules, in Piatetsky-Shapiro, G. and Frawley, W. J., eds, "Knowledge Discovery in Databases," AAAI/MIT, Press, Cambridge, MA.
- [11] Agrawal, R., Imielinski, T., Swami, A., "Mining Association Rules Between Sets of Items in Large Databases," SIGMOD Conference 1993: 207-216.
- [12] Hipp, Jochen, Güntzer, Ulrich and Nakhaeizadeh, Gholamreza, (2000), Algorithms for association rule mining - A general survey and comparison. SIGKDD Explorations, 2(2):1-58.
- [13] Tan, Pang-Ning, Michael, Steinbach, Kumar, Vipin, (2005), "Chapter 6. Association Analysis: Basic Concepts and Algorithms," Introduction to Data Mining, Addison-Wesley, ISBN 0321321367.
- [14] Pei, Jian, Han, Jiawei and Lakshmanan, Laks V. S., (2001), Mining frequent itemsets with convertible constraints. In Proceedings of the 17th International Conference on Data Engineering, April 2-6, Heidelberg, Germany, pages 433-442.
- [15] Agrawal, Rakesh and Srikant, Ramakrishnan, Fast algorithms for mining association rules in large databases. In Jorge B. Bocca, Matthias Jarke, and Carlo Zaniolo, editors, (1994), Proceedings of the 20th International Conference on Very Large Data Bases, VLDB, pages 487-499, Santiago, Chile, September.
- [16] Mohammed, J., Zaki, (2000), Scalable algorithms for association mining. IEEE Transactions on Knowledge and Data Engineering, 12(3):372-390, May/June.
- [17] Hajek P., Havel I., Chytil M.: The GUHA method of automatic hypotheses determination, Computing 1(1966) 293-308.
- [18] Hajek, Petr, Feglar, Tomas, Rauch, Jan, Coufal, David, (2004), The GUHA method, data preprocessing and mining. Database Support for Data Mining Applications, ISBN 978-3-540-22479-2, Springer.
- [19] Edward, R. Omiecinski, (2003), Alternative interest measures for mining associations in databases. IEEE Transactions on Knowledge and Data Engineering, 15(1):57-69, Jan/Feb.
- [20] Aggarwal, C. C. and Yu, P. S., (1998), A new framework for itemset generation. In PODS 98, Symposium on Principles of Database Systems, pages 18-24, Seattle, WA, USA.
- [21] Brin, Sergey, Motwani, Rajeev, Ullman, Jeffrey D. and Tsur, Shalom, Dynamic itemset counting and implication rules for market basket data. In SIGMOD (1997), Proceedings ACM SIGMOD International Conference on Management of Data, pages 255-264, Tucson, Arizona, USA, May 19.
- [22] Piatetsky-Shapiro, G., (1991), Discovery, analysis, and presentation of strong rules. Knowledge Discovery in Databases, p. 229-248.
- [23] Tan, Pang-Ning, Kumar, Vipin and Srivastava, Jaideep, (2004), Selecting the right objective measure for association analysis. Information Systems, 29(4):293-313.
- [24] Webb, G. L. (2007), Discovering Significant Patterns, Machine Learning 68(1), Netherlands: Springer, pages 1-33.
- [25] Gionis, A., Mannila, H., Mielikainen, T. and Tsaparas, P., (2007), Assessing Data Mining Results via Swap Randomization, ACM Transactions on Knowledge Discovery from Data (TKDD), Volume 1, Issue 3, December, Article No. 14.
- [26] Han, Jiawei, Pei, Jian, Yin, Yrwen, and Mao, Runying, (2004), Mining frequent patterns without candidate generation, Data Mining and Knowledge Discovery 8:53-87.

Energy Efficient Routing Strategy for Dynamically Arranged Homogeneous WSN

Gulista Khan¹, Hari Om Sharan² and Kamal Kumar Gola³

^{1,2}COE, TMU, Moradabad

³HOD, CS, COE, TMU, Moradabad

Abstract – A Wireless Sensor Network (WSN) is composed of sensor nodes spread over the field to sense the data. The sensed data must be gathered & transmitted to Base Station (BS) for end user queries. The used sensor nodes being in- expensive having low computation power & limited energy so are not as much reliable as their expensive macro sensor counter parts but their size and cost enable hundred to thousand of micro sensors to achieve high quality fault tolerant system. In an environment where in each round all sensor nodes have to send data to base station; it is required to effectively utilize energy of sensor nodes so as to increase the life- time of the system. The use of data aggregation & fusion as proposed in LEACH increases system lifetime by a factor of 8 as compared to conventional routing protocols. In this paper we are proposing routing strategy for dynamically moving sensor nodes. Along with data aggregation & fusion, we are trying to minimize reduction in system energy by first applying Distance Vector Routing algorithm, between all sensor nodes so as to minimize their transmission energy with in network and after that a node of highest energy among the top tier will transmit the aggregated data of whole network to base station. Keeping network topology same till any node of network dies another highest energy node from top most rank tier is chosen to communicate with BS. This technique achieves much improvement in system life time in dynamic environment.

Keywords: WSN, energy efficient, data aggregation, routing algorithm, Base station, Distance vector routing algorithm.

INTRODUCTION

A wide variety of inexpensive sensors are available those are capable of computational task and wireless communication [5, 6]. A sensor network consists of sensors that will collect useful information from environment depending on the application which can be of like measuring temperature, humidity etc.

The main constraint of sensor nodes is very low finite battery energy which limits the lifetime and quality of network, because of this fact the protocols must be designed in a way to efficiently utilize the energy of nodes to prolong the lifetime of the network. Since wireless communication consume significant amount of battery power, sensor nodes should spend as little energy as possible when receiving and transmitting data [7, 8, 9]. Network lifetime can be increased by reducing bandwidth consumption by using local collaboration among nodes & tolerate node failures.

The data generated by nodes in sensor network is too much for end user to process so methods are required to combine them into a small set of meaningful information. A simple way is data aggregation (sum, average, min, max, count) from different nodes and a more elegant approach is data fusion which can be defined as combination of several unreliable data measurements to produce a more accurate signal by enhancing the common signal & reducing uncorrelated noise [1]. The classification performed on the aggregated data might be performed by human operator or manually.

The Minimum Spanning Multi Tier Protocol (MSMTP) is based on multi hop data transmission nodes to those neighbor nodes which are connected to it in minimum spanning tree (MST) structure for all the nodes of the network and then a node of highest energy among highest rank tier will transmit the whole network aggregated data to base station, we keep on repeating this procedure.

The proposed approach (dynamically arranged Wireless Sensors) Multi Tier Routing Protocol (DAMTRP) is based on data transmission of their neighbor nodes which are connected to it in minimum distance structure by using Distance Vector Routing. A node of highest energy among highest rank Tier will transmit the whole network aggregated data to base station; we keep on repeating this procedure.

BACKGROUND

The earliest and simple approach was direct transmission in which each sensor node will sense & transmit its data to BS individually. Since base station is located far away from sensor nodes resulting higher transmission cost. Because of this high cost transmission the energy of nodes drain off faster and thus having short system lifetime. In order to solve the problem, clustering based protocols were proposed where a cluster is a group of sensor nodes, with a head node managing all other member nodes. The heads are responsible for coordinating member nodes, gathering data within the clusters, aggregating data and forwarding the aggregated data to the base station.

LEACH [1] is a cluster-based, distributed, autonomous protocol. The algorithm randomly chooses a portion of the sensor nodes as cluster heads, and lets the remaining sensor nodes choose their nearest heads to join. The cluster member's data is transmitted to the head, where the data is aggregated and further forwarded to the base station. The

LEACH algorithm reduces the number of nodes that directly communicate with the base station. It also reduces the size of data being transmitted to the base station. Thus, LEACH greatly saves communication energy.

Since the protocol randomly chooses cluster heads in each round, the energy consumption is theoretically evenly distributed among all sensor nodes.

TEEN [10] adopts a similar clustering mechanism as LEACH does. It sets two thresholds, a soft threshold and a hard threshold, during the data collecting stage to further reduce communication traffic.

In the PEGASIS protocol [2], a cluster is a chain based on geographical location. The PEGASIS protocol constructs all sensor nodes into a chain with the shortest length. Sensor nodes only communicate with their adjacent nodes so that they can send data at the lowest power level. In each round, the system randomly chooses a sensor node as the cluster head to communicate with the base station. Therefore, communication traffic is reduced.

The PEDAP protocol [3] further extended the PEGASIS protocol. In the PEDAP protocol, all sensor nodes are constructed into a minimum spanning tree. PEDAP assumes that the base station knows the location information of all sensor nodes, and the base station can predict the remaining energy of any node based on some energy dissipation model. After certain rounds, the base station removes dead sensor nodes and re-computes routing information for the network. In the setup stage, all sensor nodes only need to receive the routing information broadcasted by the base station. Thus, the PEDAP consumes less energy than the LEACH and PEGASIS protocols in the setup stage.

The Multi-tier Trace-back Protocol (MTP) [4] is an extension to the PEGASIS and PEDAP protocols. Under the MTP protocol, each sensor node calculates its distance to the base station by evaluating the signal strength from the base station. Then, the sensor nodes are partitioned into several tiers based on their distances to the base station. Data is forwarded to adjacent tier nodes that are closer to the base station, which is similar to the PEDAP protocol. Eventually, the MTP protocol chooses a node that is closest to the base station to communicate with the base station, using a mechanism similar to the PEGASIS.

In MSMTTP [12] protocol all nodes of the network will transmit the sensed information or aggregated data to their neighbor which are connected in MST structure by multi hop communication. Whole network is divided into three tiers as described in section IV-A. A node of tier1 having highest energy will transmit network's fused data to base station, and similarly a node of highest energy from lowest possible tier id is selected to transmit data to base station & in this way load is evenly distributed to all nodes of the sensor network. This will improve the overall system lifetime.

The proposed approach (dynamically arranged Wireless Sensors) Multi Tier Routing Protocol (DAMTRP) is based on data transmission of their neighbor nodes which are connected to it in minimum distance structure by using Distance Vector Routing. A node of highest energy among highest rank Tier will transmit the whole network aggregated data to base station; we keep on repeating this procedure.

THE SYSTEM MODEL

Network Model

The protocol assumes that 100 sensor nodes are distributed randomly in the network area of diameter 100m. In addition to data aggregation, each node of the network has the capability to transmit data to other sensor nodes as well as to BS. The aim is to transmit the aggregated data to base station with minimum loss of energy which in fact increase system life time in terms of rounds. In this work we consider sensor network environment where:

- Each node periodically senses its nearby environment & likes to send this data to BS.
- Base Station is placed at a fix location.
- Sensor nodes are homogeneous & energy constrained.
- Sensor nodes are dynamic & are uniquely identified time to time.
- Data fusion & aggregation is used to reduce the size of message in the network. We assume that combining n packets of size k results in one packet of size k instead of size nk .

Radio Model

We use the same radio model as discussed in [3]. In this model, a radio dissipates $E_{elec} = 50$ nJ/bit to run the transmitter or receiver circuitry and $E_{amp} = 100$ pJ/bit/m² for the transmitter amplifier. The radios have power control and can expend the minimum required energy to reach the intended recipients. The radios can be turned off to avoid receiving unintended transmissions. An r^2 energy loss is used due to channel transmission [10, 11]. The equations used to calculate transmission costs and receiving costs for a k -bit message and a distance d are shown below:

Transmitting

$$E_{tr}(k,d) = E_{elec}(k) + E_{amp}(k,d) \\ = kE_{elec} + kE_{amp}d^2$$

Receiving

$$ER_x(k) = ER_x - e_{lec}(k)$$

$$ER_x(k) = E_{elec} * k$$

Receiving is also a high cost operation, therefore, the number of receives and transmissions should be minimal. LEACH and PEGASIS use the same constants (E_{elec} , E_{amp} , and k) for calculating energy costs; therefore the proposed protocol achieves energy savings by minimizing the distance and the number of transmissions and receives for each node. In our simulations, we used a packet length k of 2000 bits. It is assumed that the radio channel is symmetric so that the energy required to transmit a message from node i to node j is the same as energy required to transmit a message from node j to node i for a given signal to noise ratio (SNR).

PROBLEM STATEMENT

In this work, our main consideration is wireless sensor networks where the sensors are randomly distributed over an area of interest. Initially the locations of sensors are fixed and the base station knows them all a priori. The sensors are in direct communication range of each other and can transmit to and receive from the base station. The nodes periodically sense the environment and have always data to send in each round of communication. The nodes fuse or aggregate the data they receive from the others with their own data, and produce only one packet regardless of how many packets they receive.

The problem is to find a routing scheme to deliver data packets collected from sensor nodes to the base station, which maximizes the lifetime of the sensor network under the system model given above. However, the definition of the lifetime is not clear unless the kind of service the sensor network provides is given. In applications where the time that all the nodes operate together is important, since the quality of the system will be dramatically decreased after first node death lifetime is defined as the number of rounds until the first sensor is drained of its energy. In another case, where the nodes are densely deployed, the quality of the system is not affected until a significant amount of nodes die, since adjacent nodes record identical or related data. In this case, the lifetime of the network is the time elapsed until half of the nodes or some specified portion of the nodes die. In general, the time in rounds where the last node depletes all of its energy defines the lifetime of the overall sensor network. All the previously defined algorithms it was assumed that sensor nodes are stationary. In this proposed approach we are taking dynamic arrangement of sensor nodes. Considering these different possible requirements under consideration we are giving possible algorithm which will give timings of all deaths for all algorithms in detail and leaves the decision which one to choose to system designers. In this approach the methods used to calculate the best path for sensor nodes is Distance Vector routing means that Routers are advertised as vector of distance and Direction. Direction is simply next sensor address and exit interface and Distance means node count. Sensors using distance vector protocol do not have knowledge of the entire path to a destination. In distance vector routing, the least cost route between any two nodes is the route with minimum distance. In this protocol, as the name implies, each node is moving dynamically, maintains a vector (table) of minimum distance to every node. As the name suggests the routing algorithm used DV protocol is based on calculating the direction and distance to any link in a network. The cost of reaching a destination is calculated using various route metrics. RIP uses the hop count of the destination take into account other information such as node delay and available bandwidth. After one transmission of data Updates are performed periodically in a distance-vector protocol where all or part of a router's routing table is sent to all its neighbors that are configured to use the same distance-vector routing protocol. Once a node has this information it is able to amend its own routing table to reflect the changes and then inform its neighbors of the changes.

SENSOR NODE INFORMATION

DAMTRP protocol initially partitions all sensor nodes into different tiers, in according to the distance towards the base station. The system assigns a tier ID to each node during the initialization stage. Those sensor nodes having the same tier ID are treated to be in the same tier. They approximately have the same distance towards the base station, and they consume approximately the same energy to communicate with the base station. Nodes closer to the base station are assigned lower tier IDs. Section IV-A describes the details how tier ID are assigned. But due to dynamically arranged wireless sensor nodes after every transaction or sending data units initialization process executes. This process will continue until all nodes dead.

For a sensor node in the proposed system, adjacent nodes with lower tier IDs are called its upper tier nodes (closer to the base station), while adjacent nodes with higher tier IDs are called down tier nodes (farther off the base station), nodes with the same tier ID are called peer nodes (approximately the same distance to the base station). Data trace-back will forward a node's data to its upper tier nodes, where the data is aggregated and further forwarded to even upper nodes. Basic information of a sensor node includes location of node, node ID, tier ID, energy contained by that node, energy threshold defined, distance of node from base station & energy required by the node to transmit data to BS, which is represented in the Table 1

Table 1: Structure of the Node

X	Y	Tier_id	Node_id	Energy	Threshold	Distance	Transmission Energy
---	---	---------	---------	--------	-----------	----------	---------------------

Where X, Y represents the location of the node in the network, node ID is globally assigned and is unique; the tier ID represents the distance towards the base station, and it is determined during the system initialization; energy of node records current remaining energy of the node; the energy threshold is used to decide whether or not the node has enough energy to communicate with the base station, distance contains distance of node from base station, and transmission energy contains amount of energy required to transmit data to BS. Some factors like location of node, node ID and the tier ID, distance, transmission energy are static, remains unchanged during the lifetime of the sensor node. The remaining energy will change during its lifetime. The energy threshold is dynamically set by the base station, which is least energy required by a node to transmit data to BS and is redefined time to time and is half of its previous value.

PROTOCOL DESCRIPTION

Tier Partitioning

The system partition the whole network into three tiers based on the distance from the base station. The least possible distance $d1$ (from middle of that side which is towards base station) & largest distance $d2$ (from that corner of the network which is on other side of base station) is calculated, and after their difference is calculated as:

$$\text{Diff} = \text{largest distance} - \text{least distance}$$

Now the nodes are assigned tier id based on their distance from base station as: $X, Y, \text{Tier_id}, \text{Node_id}, \text{Energy}$
Threshold Distance Transmission energy

For **Tier 1**, distance is in range $d1$ & $d1 + \text{diff}/3$

For **Tier 2**, distance is in range $d1 + \text{diff}/3$ & $d1 + 2 * \text{diff}/3$

For **Tier 3**, distance is in range $d1 + 2 * \text{diff}/3$ & $d2$

Data Transmission to BS

In this protocol, each sensor node forwards its sensed, aggregated data to that neighbor node which is connected to according to Distance vector Routing scheme. Then a node of top most rank will transmit the aggregated data of all nodes of the network to the base station as shown in figure 1 below:

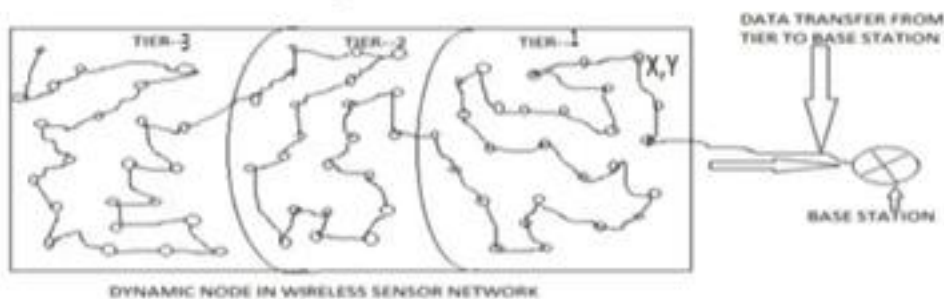


Fig. 1: Proposed Architecture when Transmission is through Tier1 Node

Nodes of tier1 continues to transmit aggregated data to base station until all nodes of tier1 have energy greater than defined threshold level, when all nodes of tier1 have energy below threshold energy then nodes of tier2 will transmit data to base station and same procedure will be shifted to nodes of tier3. This procedure is known as TOP TIER SHIFTING as depicted in figure 2.

When all nodes of tier3 have energy below threshold energy then a new threshold is defined. This procedure is continued until threshold goes below dead energy, at that moment all nodes of network are dead so the network is assumed to be dead.

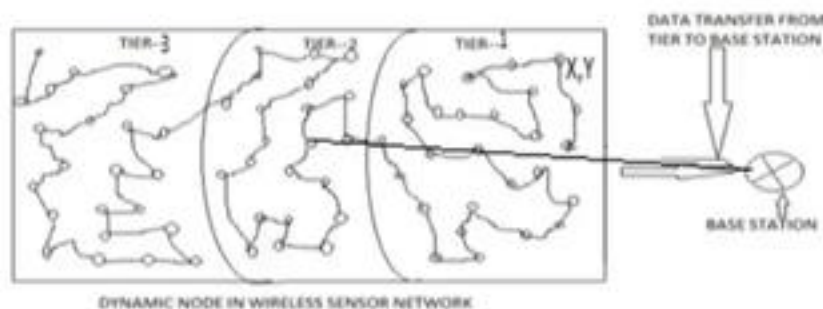


Fig. 2: Proposed Architecture in Top Tier Shifting Approach

Proposed Algorithm

Algorithm for the proposed routing model is as:

1. Distribute energy in network area keeping track of their location used to assign tier-id to them with a node closest to BS in tier1 and farthest in tier3, assign initial energy to them & calculate energy required to transmit data to BS and to nodes within network.
2. Generate Distance Vector Table of nodes arranged in form of graph to communicate data within network.
3. Select a Head node among tier1 of highest energy which will transmit network aggregated data to BS, having energy more than transmission energy.
4. Transmit data to BS and deduct energy of Head node, if energy of node is below dead energy then discard that node from network area.
5. If no node is available in tier1 having energy more than transmission energy then increment tier id by 1 and chose a node from tier2 to transmit data to BS.
6. Repeat the procedure to transmit data to BS by incrementing tier-id till and when it reaches to 4 a new threshold is defined and tier-id is set to 1.
7. This new threshold is defined to the level until it goes beyond dead energy of a node, after this value network is considered to be dead.

RESULTS

In order to evaluate the performance of DAMTRP, we will simulate it on 100 node network. The simulations will do in c++. The BS is located at (0,-100) in a field of diameter 100m. We will run the simulation to determine the round in which every node is died. Parameters using will be same as that of [3]. Once a node dies it is considered dead for the rest of simulation, and our results expected to show much better system stable lifetime (period when all nodes of network are alive) because it balances energy dissipation among sensor nodes by using all nodes as cluster head with equal priority (highest energy node will serve as head node) thus maximizing stable life time & achieves better results.

CONCLUSION AND FUTURE SCOPE

In this paper a routing strategy based on Distance vector Routing protocol and tier formation of nodes is proposed. Generation of table of minimum distance in each round of communication tries to balance the load among the nodes. The distribution of load evenly to all nodes has a great impact on system stable lifetime.

In the presented work we have taken homogeneous WSN which is randomly deployed and dynamically arranged, some nodes are regularly used in communication becomes key nodes for transmission to BS as well as within the network. These nodes have short lifetime. We will implement in C++ to show the performance of our scheme.

REFERENCES

- [1] Heinzelman, W. R., Chandrakasan, A., and Balakrishnan, H., (2000), "Energyefficient communication protocol for wireless microsensor networks," in 33rd Annual Hawaii International Conference on System Sciences, pp. 3005-3014.
- [2] Lindsey, S. and Raghavendra, C. S., (2002), "Pegasis: Power-efficient gathering in sensor information systems," IEEE Aerospace Conference, 924-955, March.
- [3] Tan, HO., (2003), "Power efficient data gathering and aggregation in wireless sensor networks," SIGMOD Record, 32(4): 66-71.
- [4] Liu, Xin, Wang, Quanyu and Jin, Xuliang, (2008), "An Energy-efficient Routing Protocol for Wireless Sensor Networks," Proceedings of the 7th World Congress on Intelligent Control and Automation June 25 - 27, Chongqing, China, page 1728-1733.
- [5] Estrin, D., Govindan, R., Heidemann, J., and Kumar, Satish,(1999), Next Century Challenges: Scalable Coordination in Sensor Networks, Proceedings of Mobicom.
- [6] Kulik, J., Rabiner, W. and Balakrishnan, H., (1999), Adaptive Protocols for Information Dissemination in Wireless Sensor Networks, Proceedings of Mobicom.
- [7] Mangione-Smith, W. and Ghang, P.S., (1996) A Low Power Medium Access Control Protocol for Portable Multi- Media Systems, Proceedings 3rd Intl. Workshop on Mobile Multimedia Communications, Princeton, NJ, 25-27, Sept.
- [8] Sivalingam, K. M., Srivastava, M. B. and Agrawal, P., (1997) Low Power Link and Access Protocols for Wireless Multimedia Networks, Proceedings IEEE Vehicular Technology Conference VTC97, May.
- [9] Stemm, M., Gauthier, P., Harada, D. and Katz, R., (1996), Reducing Power Consumption of Network Interfaces in Hand-Held Devices, Proceedings 3rd Intl. Workshop on Mobile Multimedia Communications, 25-27, Sept., Princeton, NJ.
- [10] Rappaport, T. S., (1996), Wireless Communications, Prentice-Hall.
- [11] Steele, R., (1992), Mobile Radio Communications, Pentech Press, London.
- [12] Prasad, Devendra and Bathla, Gaurav, (2010), "An Energy- efficient Routing Protocol for Homogeneous Wireless Sensor Networks," M R international journal of Engineering and Technology, Vol 2 No 2, December.

Higher Order Mutation Testing (Disastrous to Kill Mutants)

Shalini Kapoor¹ and Rajat Kapoor²

¹CSE Dept., GNI, Mullana

²Assistant Manager Finance, Accenture, Noida

Abstract—Whenever we make a single change to the original program we get First Order Mutant (FOM). When we apply another single change to FOM we get Second Order Mutant (SOM). On applying another single change to SOM we get Third Order Mutant (TOM). Mutants other than FOM are called Higher Order Mutant (HOM). In this paper we prove that as we move from FOM to SOM to TOM there will not be any test data that will kill the Original Program resulting to the formation of equivalent mutants. Equivalent Mutants are never killed hence they will never detect any fault and thus they are considered useless.

Keywords: First Order Mutant (FOM), Second Order Mutant (SOM), Third Order Mutant (TOM), Higher Order Mutant (HOM).

INTRODUCTION

Mutation testing (or Mutation analysis) is a method of software testing, which involves modifying program's source code in small ways. These, so-called mutations, are based on well-defined mutation operators that either mimic typical programming errors (such as using the wrong operator or variable name) or force the creation of valuable tests (such as driving each expression to zero). The purpose is to help the tester develop effective tests or locate weaknesses in the test data used for the program or in sections of the code that are seldom or never accessed during execution.

Mutation testing is done by selecting a set of mutation operators and then applying them to the source program one at a time for each applicable piece of the source code. The result of applying one mutation operator to the program is called a mutant. If the test suite is able to detect the change (i.e. one of the tests fails), then the mutant is said to be killed.

For example, consider the following C++ code fragment:

```
if (a && b)
    c = 1;
else
    c = 0;
```

The condition mutation operator would replace '&&' with '||' and produce the following mutant:

```
if (a || b)
    c = 1;
else
    c = 0;
```

Now, for the test to kill this mutant, the following condition should be met:

- Test input data should cause different program states for the mutant and the original program. For example, a test with a=1 and b=0 would do this.
- The value of 'c' should be propagated to the program's output and checked by the test.

Generally, in the mutation testing, a fault is introduced by a small modification of a correct program code. The modified program is called mutant, and this process is

called mutation. A transformation rule that generates a mutant from the original program is known as a mutation

operator. If the mutant and the original program generate different outputs for a test case then the mutant is called **killed mutant**. The mutant is called **alive**, if no test case can distinguish between the mutant and the original program. If the mutant survives, then the test data is considered insufficient to explore the fault. In that case, the test data is extended until such a mutant is killed. Sometime, it is not possible to find a test case that distinguishes between the output of the mutant and that of the original program in which case the mutant is called **equivalent mutant** [10].

Mutation testing performs "change and check" testing strategy. Original program is slightly modified and then executed. The output of original program and that modified program with respect to the same input set are then compared. For example - we have a program P and slightly modified (mutated) program P' and Let I be the input set. With execution of same input set I, program P gives output O and program P' give output O'

$I \rightarrow P \rightarrow O$

$I \rightarrow P' \rightarrow O'$

If $(O' \neq O)$ then it means, our test case is adequate and the functionality of the program is good.

Otherwise, if $(O' = O)$, then our test case is inadequate and the functionality of the program is poor.

Consider the example for mutant generation given in [12].

Example: Consider the program P =

```
if (c==a+b)
doThis();
else doThat();
```

Some of the possible mutants of P would be

```
P1: if (c==a-b)
doThis();
else doThat();
```

```
P2: if (c==a*b)
doThis();
else doThat();
```

```
P3: if (c==a/b)
doThis();
else doThat();
```

```
P4: if (c>a+b)
```

```
doThis();
else doThat();
```

```
P5: if (c<a+b)
```

```
doThis();
else doThat();
```

If the value of $a=2$ and $b=2$ then P2 is an equivalent mutant of P because it is not possible to find a test case that can ever kill this mutant.

Mutation testing is typically computationally expensive because a program may have a large number of faults, and there may be a large number of mutants for even a small software unit. Therefore, we need to generate test case in such a way that the test data make the execution of the program to reach each mutated statement [7].

Weak mutation testing (or weak mutation coverage) requires that only the first condition is satisfied. Strong mutation testing requires that both conditions are satisfied. Strong mutation is more powerful, since it ensures that the test suite can really catch the problems. Weak mutation is closely related to code coverage methods. It requires much less computing power to ensure that the test suite satisfies weak mutation testing than strong mutation testing.

EQUIVALENT MUTANTS

Many mutation operators can produce equivalent mutants. For example, consider the following code fragment:

```
int index=0;
while (...)
{
...;
index++;
if (index==10)
break;
}
```

Boolean relation mutation operator will replace "==" with ">=" and produce the following mutant:

```
int index=0;
while (...)
{
...;
index++;
if (index>=10)
break;
}
```

However, it is not possible to find a test case which could kill this mutant. The resulting program is equivalent to the original one. Such mutants are called equivalent mutants.

Equivalent mutants detection is one of biggest obstacles for practical usage of mutation testing. The effort, needed to check if mutants are equivalent or not, can be very high even for small programs.

MUTATION OPERATORS

A variety of mutation operators were explored by researchers. Here are some examples of mutation operators for imperative languages:

- Statement deletion.
- Replace each boolean subexpression with true and false.
- Replace each arithmetic operation with another one, e.g. + with *, - and /.
- Replace each boolean relation with another one, e.g. > with >=, = and <=.
- Replace each variable with another variable declared in the same scope (variable types should be the same).

These mutation operators are also called traditional mutation operators. Beside this, there are mutation operators for object-oriented languages, for concurrent constructions, complex objects like containers etc. They are called class-level mutation operators. For example the MuJava tool offers various class-level mutation operators such as: Access Modifier Change, Type Cast Operator Insertion, and Type Cast Operator Deletion.

Typically for testing, only first order mutants are considered. If we apply a mutation operator to a mutant, we generate a mutant of a mutant. This is called a second order mutant. If we mutate a second order mutant, we obtain a third order mutant and so on. These “higher order” (i.e. higher than first order) mutants are not normally considered in Mutation Testing.

Using only first-order mutants has been justified in two ways. Firstly, it is argued that if our test finds the small differences defined by first-order mutants, then it is likely that it will find larger differences defined by higher-order mutants: this is called the coupling effect. Secondly, it is also argued that real programmers make small mistakes and thus that real programs are like first-order mutants of correct programs: this is called the competent programmer hypothesis.

The reason for only using first-order mutants is also pragmatic: if we do not restrict ourselves to first-order mutants, then the total number of mutants is likely to be extremely large. In fact, even when we only produce first-order mutants, mutation testing tools produce large numbers of mutants for even small pieces of code. This is one of the reasons why mutation testing currently does not scale up beyond unit testing.

A test case t kills the mutant p' of p if p and p' produce different output when given the input from t . A mutant p' of p is an equivalent mutant if no test input kills p' . An equivalent mutant p' of p is syntactically different from p (the code is different) but semantically equivalent (p and p' define the same input/output function). In mutation testing, system produce some set of mutants and a test set is said to be adequate if it kills all of the non-equivalent mutants. The mutation coverage measurement is the percentage of the non-equivalent mutants produced that are killed by the test set. The aim is to produce a test set that achieves 100% coverage.

PROPOSED WORK

To demonstrate that Higher Order Mutation Testing leads to equivalent mutants we take the example for swapping of two numbers in C language.

Original_Program

```
#include<stdio.h>
#include<conio.h>
void main()
{
int temp , x,y;
clrscr();
printf("Enter the numbers to be swapped");
scanf("%d%d",&x,&y);
temp=x;
x=y;
y=temp;
printf("The numbers after swapping are%d%d",x,y);
}
```

EHR and its Impact in Health Informatics

Mukesh Joshi

Asst. Professor, Amrapali Institute, Haldwani

Abstract—Through EHR and its application the objective behind the health informatics can gain success. The EHR provide the essential infrastructure required to enable the adoption and effective use of new health care terminologies and various management tools like CDSS, evidence-based medicine and many more.

Keywords: EHR, Quality of Care, Infrastructure, Privacy.

INTRODUCTION

Health Informatics is a discipline developed by intersection of Computer Science and Health Care. It is a term which associates storage, accessing and using of IT Enabled applications in Health Care Industry. As we already know that the health sector is incorporated with very less IT enabled applications. Therefore Health Informatics has the great potential to improve quality, safety and efficiency in Health Care. The critical factor in using IT in health services is the Cost and Complexity of the structure especially for Rural Areas.

EHR (Electronic Health Record) or the record of the patient in electronic form. Through EHR and its application the objective behind the health informatics can gain success. The EHR provide the essential infrastructure required to enable the adoption and effective use of new health care terminologies and various management tools like CDSS, evidence-based medicine and many more.

Using of Health Informatics through EHR can improve the individual patient care in remote areas where distance is major factor in providing better health care Facilities. Computer enabled health care services allow Public health care to be incorporated with various advantages which includes early detection of infectious disease outbreaks across remote areas as well as it also improve the tracking of chronic disease management. The Informatics enabled services for health care involve both computer hardware and software that deals with the storage, sharing and retrieval of data and knowledge related with health care.

EHR (ELECTRONIC HEALTH RECORD)

The electronic health record is a systematic collection of patients' records in digital form. This digital information about patient is being shared across different health care settings by using various health care applications. The digital format of information about the patients may include the information in Comprehensive or in summarize form, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, personal status like age, weight, vital signs and billing information. The objective of using EHR in Health Informatics is automation and streamlining of the work flow in health care which increases the safety of population through evidence-based decision support, quality management and outcomes reporting.

The Digital Format of Patient Record can be divided under following terms: HER (Electronic Health Record), EPR (Electronic Patient Record) and EMR (Electronic Medical Record) can always use interchangeably but still we can differentiate them. The EMR can be defined as the legal patient record created in recognized hospitals and ambulatory environment. The EMR can also be used as the data source for the EHR. One has to also note that EHR is generated and maintained with in an institution comprises of all the general medical facilities for e.g. hospitals, clinic, or physicians office. It can be used by health care providers, employers, and payers or insurers access to a patient's medical records.

FEATURES OF EHR

Cost

The Developing countries in world are allocating vast amount of funds towards the health care industry. This investment may lead the development of a reliable EHR which in turn affects the positive growth in health care industry.

Improve Quality of Care

EHR is very helpful in producing a good quality of health care services. EHR may help lessen patient sufferance due to medical errors and inability of analysts to assess quality. Use of Informatics in Health sector may lead to automate day-to-day processes, thus helping to reduce administration costs which then in turn can free up time and money for patient care. EHR systems can reduce medical errors by providing health workers with decision support Systems. Quality of Health care is also improve as EHR allow fast access to medical literature and current best practices available in different part of world in health care services.

In the above program if value of $x=5, y=10$ than after swapping x will be equal to 10 and y will be equal to 5. Now we introduce a single change(changed variable x to y) in the Original_Program which is shown in Bold below and call it FOM(First Order Mutant)

FOM

1. temp=y;
2. **x=y;**
3. y=temp;

Change is made at line1. If value of $x=5, y=10$ FOM will give the output as $x=10, y=10$.

Since this output is different from Original_Program we say that FOM is killed.

Now we introduce a single change to the FOM which is shown in Bold below and call it SOM (Second Order Mutant)

SOM

1. temp=y;
2. **y=x;**
3. y=temp;

Change is made at line2. If value of $x=5, y=10$ SOM will give the output as $x=5, y=10$.

Since this output is different from Original_Program we say that SOM is killed.

Now we introduce a single change to the SOM which is shown in Bold below and call it TOM (Third Order Mutant)

TOM

1. temp=y;
2. y=x;
3. **x=temp;**

Change is made at line3. If value of $x=5, y=10$ TOM will give the output as $x=10, y=5$.

Since this output is same as Original_Program we say that TOM is alive. Since there is no test case that can kill TOM we say that this produces Equivalent Mutants. Higher in the order we went, we got equivalent mutants.

We depict the results of mutants in the table below.

Mutant	Data & Result		Status
	X=5	Y=10	
Original Program	10	5	---
FOM	10	10	Killed
SOM	5	10	Killed
TOM	10	5	Alive

The result is shown in graph below:

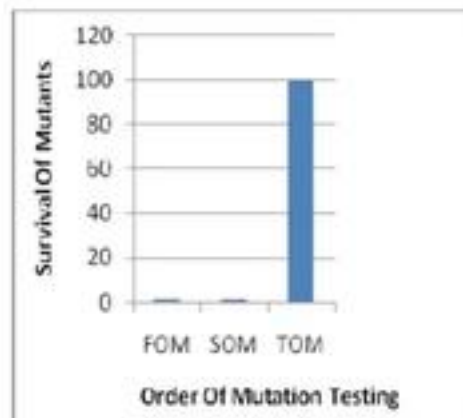


Fig. 1

CONCLUSION

The paper concludes that Lower Order Mutation Testing (LOM) is more powerful in finding faults. As we move to Higher Order Mutation Testing –Third Order Mutants and higher, Equivalent Mutants are obtained which have very high survival rate and hence turn out useless for finding faults.

REFERENCES

- [1] Acree, A.T., (1980), On Mutation, Phd thesis, Georgia Institute of Technology, Atlanta, Georgia.
- [2] Budd, T.A., (1980), Mutation Analysis of Program Test Data, Phd thesis, Yale University, New Haven, Connecticut.
- [3] Wong, W.E., (1993), On Mutation and Data Flow, Phd thesis, Purdue University, West Lafayette, Indiana.
- [4] Mathur, A.P. and Wong, W. E., (1993), An Empirical Comparison of Mutation and Data Flow Based Test Adequacy Criteria, Technique report, Purdue University, West Lafayette, Indiana.
- [5] Namin, A.S. and Andrews, J. H., (2007), On Sufficiency of Mutants, Proceedings of the 29th International Conference on Software Engineering (ICSE COMPANION'07), pages 73–74, Minneapolis, Minnesota, 20–26 May.
- [6] Mathur, A.P., (1991), Performance, Effectiveness, and Reliability Issues in Software Testing, Proceedings of the 5th International Computer Software and Applications Conference (COMPSAC'79), pages 604–605, Tokyo, Japan, 11–13 September.
- [7] Sahinoglu, M. and Spafford, E. H., (1990), A Bayes Sequential Statistical Procedure for Approving Software Products, Proceedings of the IFIP Conference on Approving Software Products (ASP'90), pages 43–56, Garmis Partenkirchen, Germany, September, Elsevier Science.
- [8] DeMillo, R.A., Guindi, D. S., King, K. N., McCracken, W. M. and Offutt, A. J., (1988), An Extended Overview of the Mothra Software Testing Environment, In Proceedings of the 2nd Workshop on Software Testing, Verification, and Analysis (TVA'88), pages 142–151, Banff Alberta, Canada, July, IEEE Computer society.
- [9] Offutt, A.J., Rothermel, G. And Zapf, C., (1993), an Experimental Evaluation of Selective Mutation. In Proceedings of the 15th International Conference on Software Engineering (ICSE'93), pages 100–107, Baltimore, Maryland, May, IEEE Computer Society Press.
- [10] Wong, W.E. and Mathur, A. P., (1995), Reducing the Cost of Mutation Testing: An Empirical Study, *Journal of Systems and Software*, 31(3):185–196, December.
- [11] King, K.N. and Offutt, A. J., (1991), A Fortran Language System for Mutation- Based Software Testing Software: Practice and Experience, 21(7):685–718, October.
- [12] Mresa, E.S. and Bottaci, L., (1999), Efficiency of Mutation Operators and Selective Mutation Strategies: An Empirical Study. *Software Testing, Verification and Reliability*, 9(4):205–232, December.
- [13] Namin, A.S. and Andrews, J. H., (2006), Finding Sufficient Mutation Operators via Variable Reduction, Proceedings of the 2nd Workshop on Mutation Analysis (MUTATION'06), page 5, Raleigh, North Carolina, November, IEEE Computer Society.
- [14] Namin, A. S. and Andrews, J. H., (2007), On Sufficiency of Mutants. In Proceedings of the 29th International Conference on Software Engineering (ICSE COMPANION'07), pages 73–74, Minneapolis, Minnesota, 20–26 May.
- [15] Offutt, A. J., Lee, A., Rothermel, G., Untch, R. H. And C. Zapf, (1996), An Experimental Determination of Sufficient Mutant Operators, *ACM Transactions on Software Engineering and Methodology*, 5(2):99–118, April.
- [16] Hierons, R. M., Harman, M., and Danicic, S., (1999), Using Program Slicing to Assist in the Detection of Equivalent Mutants. *Software Testing, Verification and Reliability*, 9(4):233–262, December.
- [17] Harman, M., Hierons, R. and Danicic, S., (2001), The Relationship Between Program Dependence and Mutation Analysis, Proceedings of the 1st Workshop on Mutation Analysis (MUTATION'00), pages 5–13, San Jose, California, 6–7 October, published in book form, as *Mutation Testing for the New Century*.

Effect of Scalability and Mobility on TCP Performance using Routing Protocols in Mobile ADHOC Network

Meenakshi Kamboj, Pooja Dhiman, Vandana Singla and Richa Gupta

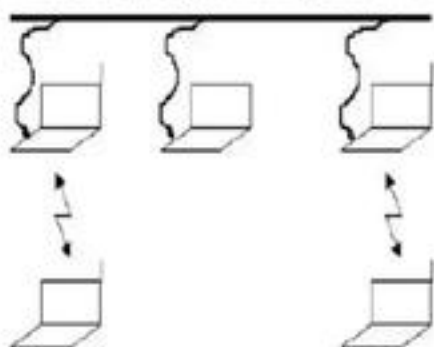
HEC, Jagadhri, Haryana

Abstract—TCP was mainly developed to be deployed within wired networks. Recently, many researchers have studied its performance within Mobile Adhoc Networks (MANETs) and it was found that TCP performance is highly influenced by the characteristics of such networks. In this dissertation, we intend to study the effect of Adhoc routing protocols on TCP performance (energy consumption and average good put) within MANETs. We considered studying different types of ad hoc routing protocols having different characteristics: reactive vs. proactive, distance vector vs. link state, and source routing. Our study results show that; AODV as a routing protocol leads to most accepted protocol and this is confirmed at different mobility levels. In this dissertation, we have analyzed the TCP performance using routing protocols by varying scalability & mobility in MANET. We have also studied the impact of changing mobility & scalability on Packet Delivery Ratio, Energy Consumption & number of Collision.

Keywords: Mobile Adhoc Networks, Routing Protocols, Routing Schemes, Glomosim.

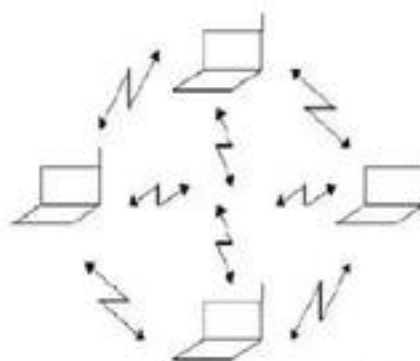
INTRODUCTION

A mobile adhoc network (MANET) is a collection of wireless nodes that can be set up dynamically anywhere and anytime without using any pre-existing network infrastructure.



Infrastructure Network

Fig. 1



Ad-Hoc Network

Fig. 2

ROUTING PROTOCOLS

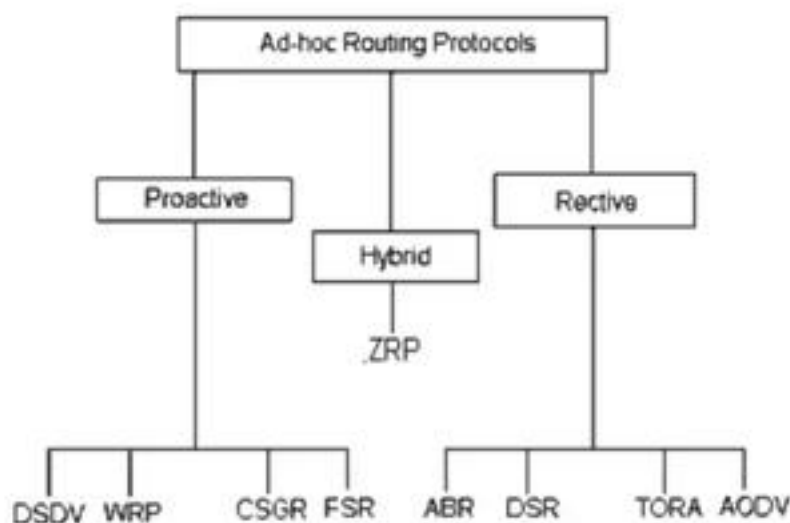


Fig. 3

RELATED WORK

- Sikdar et al.[9] described that TCP is a transport protocol that guarantees reliable ordered delivery of data packets over wired networks
- Haejung Lim Kaixin Xu, et al.[13] mentioned that in mobile adhoc networks (MANET), TCP performance is not as stable as in wired networks.
- P.Chenna Reddy et al.[15] mentioned that routing in Adhoc networks is nontrivial due to highly pre-dynamic nature of the nodes.
- Chang-Jung Kao et al.[16] mentioned that transport mechanism is proposed to improve TCP performance in heterogeneous mobile networks.
- JianXin Zhou et al.[17] mentioned that TCP reduce its performance by misinterpreting mobility losses due to node motion as congestion losses in Adhoc network.

GLOMOSIM OVERVIEW

GloMoSim stands for Global Mobile information systems Simulation library[22], [23], [24]. GloMoSim stands for Global Mobile information systems Simulation library[22], [23], [24] was designed as a set of library modules, each of which simulates a communication protocol in the protocol stack. The library uses the OSI layer approach and supports multiple protocols in each layer.

The layers are separated and each layer has its own API. The layers interact with each other using message-passing approach. A combination of different protocols at various layers into a complete protocol suite, as well as extension with alternative protocols can be done simply. The simulator is built above PARSEC[25], a C-based language that was developed for discrete-event simulations. The simulator enables various scenarios, using configuration files, and allows analysis by a trace file with statistics. The visualization tool of GloMoSim, written in Java, shows the network look, nodes mobility and packet transmissions.

LAYER	MODEL
Physical	Free-space, Two-ray
Data Link	CSMA, MACA, 802.11, TSMA
Network	Bellman-Ford, FISHEYE, WRP, AODV, DSR, LAR1, ODMPR
Transport	TCP, UDP
Application	CBR, HTTP, TELNET, FTP

GloMoSim OSI Library

Network Parameters

Simulation Time

This parameter represents the maximum simulation time.

Mobility

This parameter specifies the mobility of the nodes.

Scalability

Adhoc network can have a large number of nodes

Performance Metrics

Packet Delivery Ratio (PDR)

It is the ratio of the number of packets actually delivered without duplicates to the destinations versus the number of data packets supposed to be received.

Number of Collisions

In a network, when two or more nodes attempt to transmit a packet across the network at the same time, a packet collision occurs.

Energy Consumption

Total energy consumed in the network is energy consumption. It is measured in mWhr.

Simulation Result

To test the protocols, we performed a number of experiments to explore the performance of AODV, DSR and DSDV with respect to a number of parameters: simulation time, number of senders, node mobility, number of CBR links and area of MANET.

Mobility

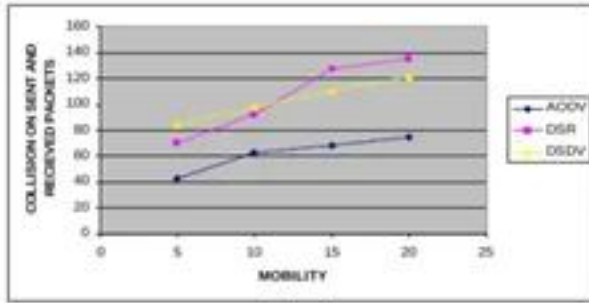


Fig. 1

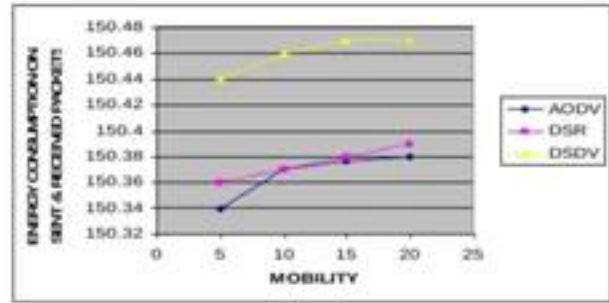


Fig. 2

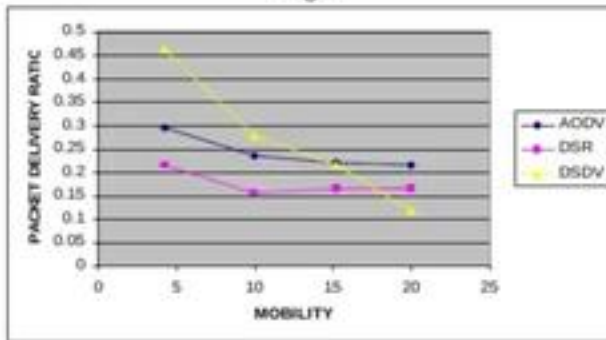


Fig. 3

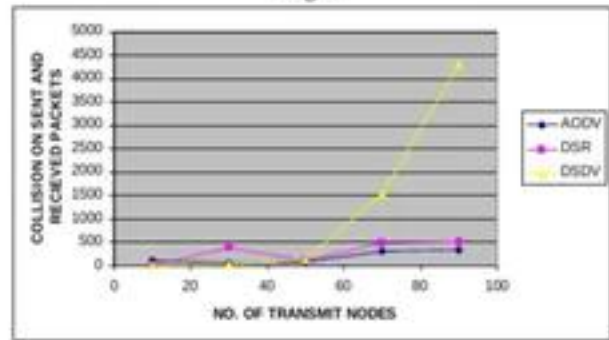


Fig. 4

Effect of Mobility on Collisions Data comparison by graph in three protocols i.e. AODV, DSR & DSDV shows that AODV protocol is good because its shows less collision.

Effect of Mobility on Energy Consumption Comparison of average Energy consumption shows that DSDV consumes more power as compare to AODV and DSR.

Effect of Mobility on Packet Delivery Ratio Packet delivery Ratio of AODV by the data comparison show much better than DSDV.

Scalability

To study the impact of Scalability, these parameters are

No. of transmit nodes

No. of CBR links

Area of Manet

Effect of No. of transmit nodes on Collisions

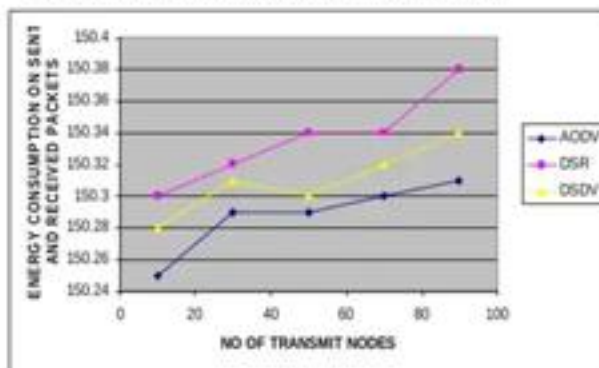


Fig. 5

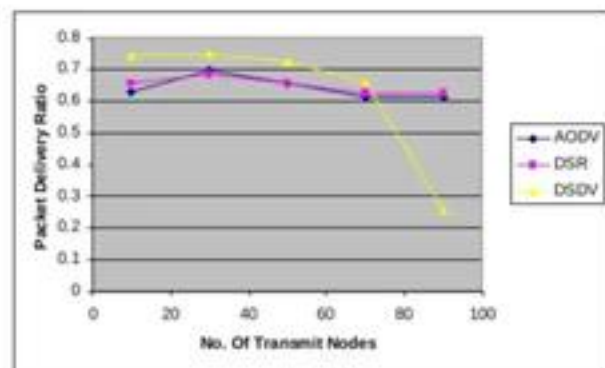


Fig. 6

Effect of no. of transmit nodes on Energy Consumption This shows that AODV energy consumption is Minimum as compared to other two protocols i.e. DSR & DSDV.

Effect of number of transmit nodes on Packet Delivery Ratio_DSDV has less packet delivery ratio as compare to AODV and DSR if no of nodes are increased further.

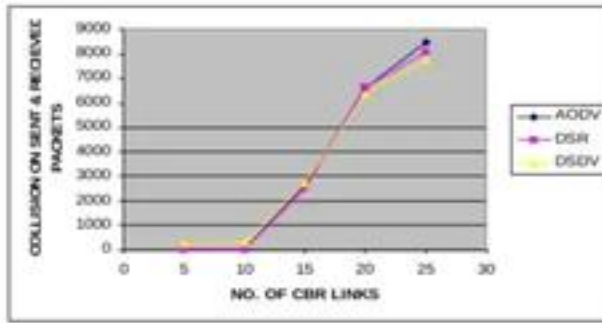


Fig. 7

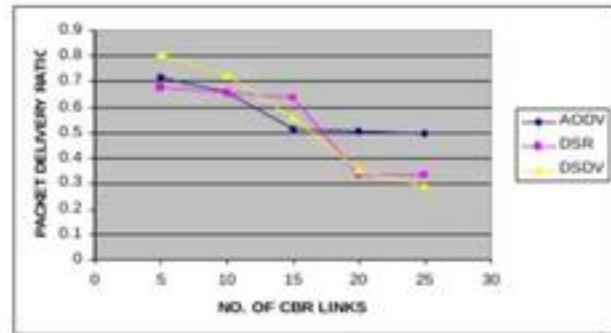


Fig. 8

Effect of no. of CBR Links on Collisions the graph shows that all three protocol having almost same value. Effect of no. of CBR Links on Packet Delivery Ratio DSR and DSDV have less packet delivery ratio than AODV.

Area of MANET

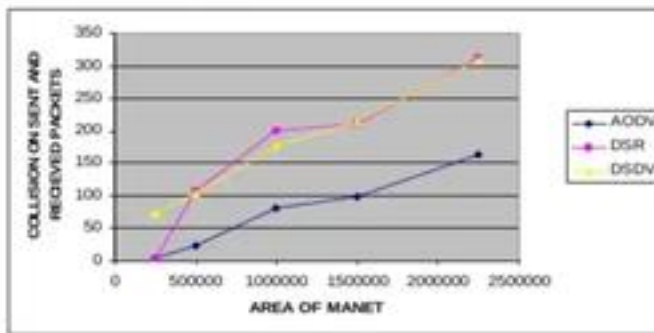


Fig. 9

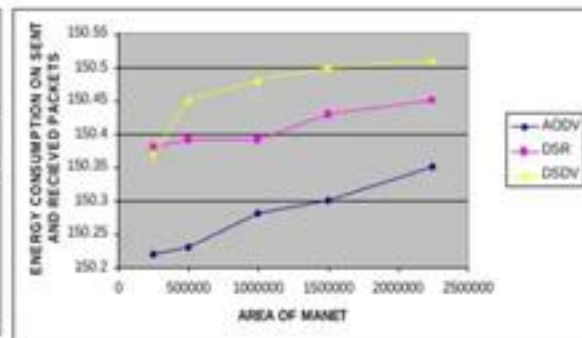


Fig. 10

Effect of Area of Manet on Collisions as we increase the area of Manet, average collision on packets increases. Effect of Area of Manet on Energy Consumption This comparative study shows AODV protocol having minimum energy consumption given area of Manet.

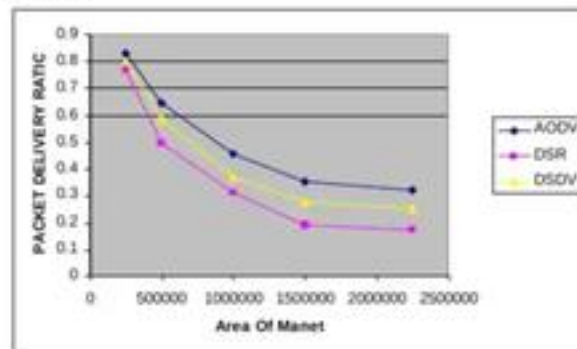


Fig. 11

Effect of Area of Manet on Packet Delivery Ratio Comparative studies of these three protocols shows that AODV protocols has maximum Packet Delivery Ratio as compare to other two protocols on same area of Manet. All these comparative studies between three protocols i.e. AODV, DSR & DSDV show that AODV protocol is best.

CONCLUSION

In this dissertation, AODV, DSR and DSDV routing protocol were studied. The performance evaluation parameters for these protocols were PDR, Collisions & Energy Consumption. We have studied the impact of mobility by changing the Collision, Energy Consumption & Packet Delivery Ratio further scalability also by changing the Collision, Energy Consumption & PDR.

The Impact of Mobility

Overall study of effect of mobility shows that no. of collisions in AODV is less as compared to other two protocols.

The Impact of Scalability

To study the impact of scalability, we varied no. of transmit nodes, no. of CBR links & area of Manet parameters.

No. of Transmit Nodes

Overall study of effect of transmitted nodes (number) show that number of collisions in AODV is less as compared to other two protocols

No. of CBR Links

Overall study of effect of CBR links shows that there is little bit difference between three protocols. As the numbers of CBR links increases, link breakage occurs more frequently and this leads to more collisions in the network.

In Area of Manet

This comparative study shows that AODV protocol consumes minimum Energy in given area of Manet. In Packet delivery ratio AODV is much better than DSDV & DSR.

All these comparative studies between three protocols i.e. AODV, DSR & DSDV show that AODV protocol is best.

Future Scope

Work implemented on simulation environment can be further extended for real time scenario. During the dissertation, three protocols have been implemented for effect of scalability and mobility. But there are more protocols which have greater impact on network performance yet not implemented and it would be planned in future. CBR links has been used till now, but this study can be extended to VBR maps VoIP for more precise and accurate results which may leads near to real life results.

REFERENCES

- [1] Wang, F. and Zhang, Y., (2002), "Improving TCP performance over mobile adhoc networks with out-of-order detection and response," Proceedings of ACM Mobihoc, pp.217-225, June.
- [2] Perkins, Charles E., (2001), "Adhoc Networking," Addison-Wesley.
- [3] IETF working group <<http://www.ietf.org/html.charters/manet-charter.html>>
- [4] Asis Nasipuri, Book Chapter "Mobile Adhoc Networking," in hand book of RF and Wireless Technologies, (2004), Edited by Farid Dowla, Newnes.
- [5] Cheng, E., (2001), "On-demand multicast routing in mobile adhoc networks", M.Eng. thesis, Carleton University, Department of Systems and Computer Engineering.
- [6] Bagrodia, R., Gerla, M., Hsu, J., Su, W., and Lee, S.-J., (2000), "A performance comparison study of adhoc wireless multicast protocols", Proc. of the 19th Annual Joint Conf. of the IEEE Computer and Communications Societies, March, pages 565-574.
- [7] Das, Samir R., Perkins, Charles E. and Royer, Elizabeth M., (2000), "Performance comparison of two on-demand routing protocols for adhoc networks," in Proceedings of INFOCOM 2000 Conference, Tel-Aviv, Israel, March.
- [8] Han L., (2004), Wireless Adhoc Network; October 8.
- [9] Sikdar, B., Kalyanaraman, S., and Vastola, K. S., (2003), Analytic models for the latency and steady-state throughput of TCP Tahoe, Reno and SACK. IEEE/ACM Transactions on Networking, 11(6):959-971, December.
- [10] Seddik-Ghaleb, A., Ghamri-Doudane, Y., Senouci, S.-M. Sensor and Adhoc Communications and Networks, (2006). SECON apos, 06, (2006) 3rd Annual IEEE Communications Society on Volume 3, Issue , 28-28 Sept. 2006 Page(s):866-873.
- [11] Santiv'anez, C., McDonald, B., Stavrakakis, I. and Ramanathan, R.,(2002), "On the scalability of adhoc routing protocols," Proceedings of IEEE Infocom'02, New York, June.
- [12] Huang, Lifei and Lai, Ten-Hwang, (2002), "On the scalability of IEEE 802.11 ad hoc networks," in Proceedings of the Third ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc 2002), Lausanne, Switzerland, June.
- [13] Kaixin Xu, Haejung Lim, Gerla, Mario, TCP Performance over Multipath Routing in Mobile Adhoc Networks 2003 IEEE<haejung93.lim@samsung.com>.
- [14] Yu, Xin, (2004), "Improving Tcp Performance Over Mobile Adhoc Networks With Out Of Order Detection And Response" MobiCom'04, September.
- [15] Reddy, P. Chenna, ChandraSekhar Reddy, Dr. P., (2006), Performance Analysis of Adhoc Network Routing Protocols, IEEE.
- [16] Kao, Chang-Jung, (2003), Wanjiun Liao, and Chin-Hei Chien-Jen-Chi Liu, Improving TCP Performance in Heterogeneous Mobile Networks, IEEE.
- [17] Zhou, JianXin, Shi, BingXin and Ling Zou, (2003), Improve TCP performance in Adhoc network by TCP-RC, IEEE.
- [18] Ramarathinam, V., Labrador, M. A., (2002), "Performance Analysis of TCP over Static Wireless adhoc networks," ISCA 15th International Conference on Parallel and Distributed Computing Systems, PDCS'02, Sep.
- [19] Aaron, Anne and Weng, Jie, (2000-2001), "Performance Comparison of Ad-hoc Routing Protocols for Networks with Node Energy Constraints," EE 360 Class Project Spring.
- [20] Hellbr'uck, Hoest and Fischer, Stefan, (2002), Towards analysis and simulation of adhoc networks, Proceedings of the 2002 International Conference on Wireless Networks (ICWN02), USA, June; pp. 69-75; Available on: <<http://citeseer.ist.psu.edu/531702.html>>
- [21] GloMoSim; Available on: <<http://pcl.cs.ucla.edu/projects/glomosim>>
- [22] Bajaj, L., Takai, M., Ahuja, R., Bagrodia, R. and Gerla, M., (1999), Glomosim: "A scalable network simulation environment" Technical Report 990027, UCLA Computer Science Department, Available on: <citeseer.ist.psu.edu/225197.html>.
- [23] Zeng, X., Bagrodia, R. and Gerla, M., Glomosim: A library for parallel simulation of large-scale wireless networks; In Workshop on Parallel and Distributed Bibliography 65 Simulation; Canada, May 1998; pp. 154-161, Available on: <citeseer.ist.psu.edu/zeng98glomosim.html>.
- [24] Naevo, J., (2003), A comprehensive glomosim tutorial; March, Available on: <<http://www.cs.virginia.edu/~jx9n/courses/cs656/glomoman.pdf>>.
- [25] PARSEC; Available on: <<http://pcl.cs.ucla.edu/projects/PARSEC>>

Throughput Performance Analysis of IEEE 802.11b Wireless LAN

Madnesh Kumar Gupta¹, Ganesh Gupta² and C.S. Rai³

¹University School of IT, GGS Indraprastha University, Delhi

²Faculty, Amity School of Engg. & Technology, Amity University, Gurgaon, Haryana

³Asso. Professor, University School of IT, GGS Indraprastha University, Delhi

Abstract—Technological progression in data communication is occurring rapidly. The future of Information Technology features users enjoying easier and probably everywhere communications. However, communication technology plays significant role, whether wired or wireless. In this paper we analysis the throughput performance of IEEE 802.11b WLAN under high traffic load conditions by simulation. A simulation model has been developed using the ns-2 simulator to analysis the throughput performance of the IEEE 802.11b DCF protocol.

Keywords: IEEE, protocol, simulation model, network

INTRODUCTION

IEEE 802.11b-based MAC protocols are gaining widespread popularity as a layer-2 protocol for WLANs. This popularity is because of the simplicity in operation, low cost, robustness, and user mobility offered by the technology. A good medium access control (MAC) protocol for WLANs should provide an efficient mechanism for sharing a limited wireless channel bandwidth, together with simplicity of operation, fairness in serving all stations, and high bandwidth utilization. Ideally high throughput under high traffic load conditions is desired, but in reality it is usually very difficult to satisfy the quality of service (QoS). Detailed discussion of IEEE 802.11-based WLANs can be found in the wireless networking literature (1999; Bianchi, 2000; Tickoo & Sikdar, 2003; Xu, Gerla, & Bae, 2002). Cali et. al (2000) proposed an enhancement to the IEEE 802.11 protocol called Dynamic IEEE 802.11, which is basically a distributed algorithm for altering the size of the backoff window. Bruno and Conti (2002) analyzed the performance of p-persistent IEEE 802.11. Instead of the binary exponential backoff used in the original IEEE 802.11 protocol, the backoff interval of the p-persistent IEEE 802.11 is sampled from a geometric distribution with a parameter p. Cesana et. al (2003) investigated a new scheme called Interference Aware MAC (IA-MAC) to improve the performance of IEEE 802.11 in environments with high interference levels. Richard Lin and Liu (2002) proposed a scheme called Distributed Cycle Stealing (DCS) to enhance the performance of IEEE 802.11 by applying power control and spatial reuse. The remainder of this paper is organized as follows. We first provide an overview of IEEE 802.11 protocol and then describe a simulation model for performance study of the IEEE 802.11b. The performance of IEEE 802.11b is examined, and a brief conclusion ends the paper.

OVERVIEW OF IEEE 802.11 WLAN

The IEEE 802.11 standard covers both physical and MAC layer of open system interconnections (OSI) model (Anonymous, 1999). The standard specifies that a network can be configured in two different ways: (1) ad hoc; and (2) infrastructure. In an ad hoc network, computers are brought together to form a network dynamically. There is no definite structure and any two computers can communicate as long as they are within the 'hearing' range from each other. In an infrastructure network, mobile stations communicate through an access point linked to the wired backbone network. IEEE 802.11 MAC layer coordinates wireless channel access among the active stations on the network. This coordination is implemented using a distributed coordination function (DCF) and a point coordination function (PCF). We consider the DCF mode in IEEE 802.11 which has been widely deployed because of its simplicity and robustness. IEEE 802.11 adopts a carrier sense multiple access with collision avoidance (CSMA/CA) protocol, which requires every station to perform carrier sensing to determine the current state of the channel (i.e., idle or busy).

Figure 1 illustrates the basic operation of IEEE 802.11 DCF protocol. A station with a packet to transmit monitors the channel activities until an idle period equal to a DCF inter-frame space (DIFS) is detected. After sensing an idle DIFS, the station waits for a random backoff interval before transmitting. The collision avoidance mechanism adopted in the IEEE 802.11 standard is based on a binary exponential backoff scheme, which is implemented by each station by means of a parameter known as the backoff counter.

The backoff time is used to initialize the backoff counter. This counter is decreased only when the medium is idle and is frozen when activity is sensed. The backoff counter is periodically decremented by one slot time each time the medium sensed is idle for a period longer than a DIFS. A station transmits a packet when its backoff counter is zero.



Fig. 1: Basic Operation of IEEE 802.11 DCF

Table 1

Parameter	Values
Bandwidth	11 Mbps
Basic Rate	2 Mbps
SIFS	10 microsec
DIFS	50 microsec
Slot time	20 microsec
Traffic type	UDP
Application	CBR
RTS/CTS	Off
PHY modulation	DSSS
CWmin	31
CWmax	1023
Simulation time	50 seconds

SIMULATION MODEL OF IEEE 802.11

A simulation model has been developed using the ns-2 simulator (Fall & Varadhan, 2003) to study the throughput performance of the IEEE 802.11b DCF protocol.

MODELING ASSUMPTIONS AND CONFIGURATION

To simplify the simulation model, we consider a perfect radio propagation environment in which there is no transmission error due to interference and noise on the system, and no hidden and exposed station problems. The following assumptions are made regarding the data traffic:

A1. Packet Generation

Streams of data packets arriving at stations are modeled as independent Poisson processes with an aggregate mean packet generating rate λ packets/s.

A2. Packet Size

Packets are of fixed length. The time axis is divided into slots of equal length, and the transmission of one packet takes one slot time.

A3. Buffer Size

Each station in the network has a large buffer, modeled as a buffer of infinite size, to store packets. This assumption means that packets cannot be lost due to a buffer overflow when the system is under manageable input loads.

A4. Destination Addresses

We assume that a packet arrives at a station are uniformal destined to $N - 1$ other stations in the network.

A5. Stations Spacing

The stations can be arbitrarily spaced on the network within the Transmission range.

A6. Analysis

We study the network performance under steady state conditions.

Table 1 lists the parameter values that we used in the simulation. Each simulation run lasts for 50 seconds simulated time, in which the first 10 seconds is the transient period. The observations collected during transient period are not included in the final simulation results.

MODEL VALIDATION

The models built using ns-2 simulator were validated using empirical measurements from wireless laptops and access points for an IEEE 802.11b wireless LAN (Sarkar, 2005). A good match between ns-2 simulation results and empirical measurements validates our simulation models. We have also compared our simulation results with the work of others (Nicolaiditis, 2003). The experimental results of the IEEE 802.11b protocol are discussed next.

Results

We consider important network performance metrics throughput for both individual stations and the overall network. The throughput (measured in Mbps) is defined as the fraction of the total channel capacity that is used for data transmission.

EFFECT OF ACTIVE STATIONS ON NETWORK THROUGHPUT PERFORMANCE

In Fig. 2, we plot network throughput versus number of active stations for both ad hoc and infrastructure networks. We observe that the network throughput decreases as we increase the number of active stations for $N = 1$ to 80 stations at 80% offered load. We also observe that the network throughput under the infrastructure network is slightly smaller than the ad hoc network, especially for $N > 30$ stations. Under both the ad hoc and infrastructure networks, the throughput is saturated at around $N = 80$ stations.

Now let us examine the maximum and minimum throughput of the IEEE 802.11b. As seen in Fig. 2, the maximum achievable throughput is 4.4 Mbps for $N = 1$ station at 80% offered load. This throughput is around 40% of the maximum theoretical bandwidth of 11 Mbps. The minimum throughput under the infrastructure network is 1.7 Mbps which is around 15.6% of the maximum bandwidth of 11 Mbps for $N = 70$ stations at 80% offered load. However, the minimum throughput under the ad hoc network is 2.9 Mbps (i.e. 26.4% of the maximum bandwidth of 11 Mbps) for $N = 80$ stations at 80% offered load.

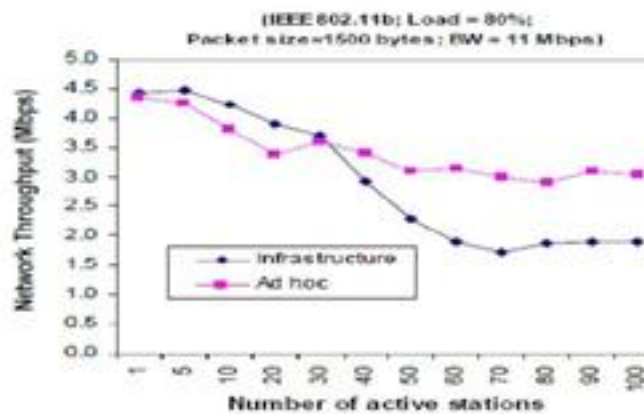


Fig. 2: Effect of Active Stations on Network Throughput Performance of IEEE802.11b

THROUGHPUT PERFORMANCE OF SELECTED STATIONS

In this experiment we consider an IEEE 802.11b infrastructure network with $N = 1, 5, 10, 20$ and 40 stations. As seen in Fig. 3 the throughput performance of the IEEE 802.11b decreases significantly as we increase the number of active stations on the network, especially for $N = 10$ to 40 stations. We observe that the throughput increases sharply with increasing offered load from 10 to 40%. For the offered load greater than 40%, the increase in throughput is not very significant.

The main conclusion we can draw from Figs. 2 and 3 is that the network throughput performance under the IEEE 802.11b WLAN deteriorates for $N > 10$ stations, especially at medium-to-high offered loads. This throughput deterioration is due to the wastage of transmission capacity in the backoff state of IEEE 802.11b protocol.

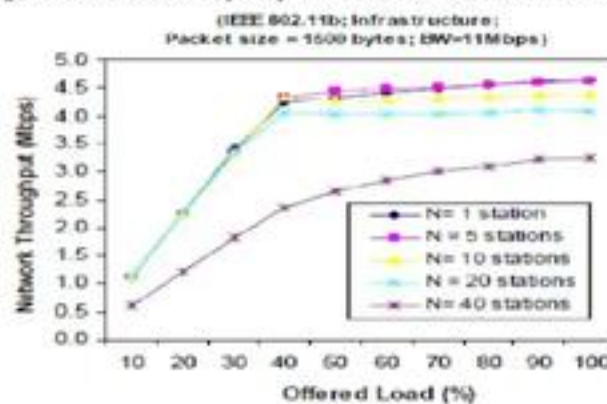


Fig. 3: Effect of Increasing Number of Active Stations on Network Throughput Performance of IEEE 802.11b Infrastructure Network

DISCUSSION AND CONCLUSION

In this paper we examined the throughput performance of IEEE 802.11b WLAN by simulation. Results show that the IEEE 802.11b does not perform well in terms high throughput at medium-to-high traffic load conditions. For example, if the number of active users increases throughput performance of the IEEE 802.11b protocol degrades significantly. In addition, the IEEE 802.11 protocol does not provide a good degree of fairness in allocating channel bandwidth among the

Evidence Based Medicine

EHR provide access to unprecedented amounts of clinical data for research which can accelerate the level of knowledge for effective medical practices. A well designed EHR supports accountable autonomy, collecting and spreading information to assist the medical professional in Decision making. EHR can also use for diagnostic tests and it can link the clinician protocols, care plans, critical paths, literature databases, pharmaceutical information and other databases which incorporate of health care knowledge.

Remote Accessing of Data

The EHR data is accessible from remote sites to many people at the same time. In EHR the record is continuously updated and is available concurrently for use everywhere. Information is immediately accessible at any unit workstation whenever it is needed. The mobility of patient's data can also be achieved through EHR. The remote accessing of information is use for CDSS (Clinical Decision Support system) and for doing research in various fields of health care.

EHR in Mobile Applications

EHR can also use to provide medical alerts and reminders about various technological trends in Health care through various mobile applications. EHR can also use with the applications use for recognizing abnormal lab results, or potential life-threatening drug interactions.

Financial Billing

EHR will provide more accurate billing information and will allow the health providers to settle their claims electronically and it results the quick receiving of payments. It also helps in reducing the repetition of same information again and again.

BARRIERS IN IMPLEMENTING EHR

Startup Cost

Investment is the main concern in implementing EHR system in Health Informatics. At a time when health care organizations need to reduce their costs, allocation of a capital in developing information system is still a great challenge. Implementation of EHR is a critical factor for small clinics even though the use of IT could generate cost savings for the health system at large that might offset the EHR's costs, many physicians might not be capable to reduce their office expenses or increase their revenue sufficiently to pay for it. Although health care providers are concerned with return on investment, but as they realize that the gains from using EHR are in terms of patient safety and efficiencies rather than in tangible measures may lead to not an effective use of EHR.

Complex Infrastructure

Selection and placement of hardware is an issue and decision regarding the portability of the equipments must also be considered while using of EHR. It requires some IT enabled devices which extent to a complex hardware infrastructure. So decision must be made to determine who enters the data and documentation forms must be revised in order to accommodate the changes.

Privacy and Security Issues

Security of the patients is prime concern while using of EHR. Law is to be designed which prevents the unauthorized use of EHR documents. The patients must also remember that the record has to be accessible to the professional who provides the medical Aids. Several security technologies which include firewalls, passwords and properly designed screens are required to ensure the security and confidentiality of the EHR data.

Using of HIPPA (Health Insurance Portability and Accountability Act) was passed in US in 1996 to establish rules and regulations for access, authentication, storage and auditing as well as transmitting the e-mail. PIPEDA (Personal Information Protection and Electronic Documents Acts) Passed by Govt. of Canada in 2000 is also responsible for EHR security. But in our country we have no such Acts which independently designed for EHR security except IT Act 2000. So privacy and security are major concerns in Implementing EHR in India.

Storage of Record

Considerations about long-term storage of electronic records are complicated by the possibility that the records are viewed by multiple independent entities. The entities include primary care physicians, hospitals, insurance companies and patients. The required length of storage of an individual electronic record will depend on national and state health policy.

active stations on the network especially at high traffic loads. Using simulation experiments we gained an insight into the performance of IEEE 802.11b WLANs under high traffic load conditions. Clearly, the existing IEEE 802.11b WLANs cannot be used for high bandwidth real time applications serving large number of users. Therefore, to achieve an optimum network performance the IEEE 802.11b WLAN requires an improvement. Although various enhancements to the original IEEE 802.11 protocol have been proposed recently, the problem of efficient channel utilization, higher throughput has not been fully solved yet. The joint MAC-physical layer design approach for performance improvement of the IEEE 802.11b is planned as an extension of the present study. The models built using ns-2 simulator were validated using empirical measurements for an IEEE 802.11b WLAN. A good match between simulation results and empirical measurements is reported from wireless laptops and access points.

REFERENCES

- [1] Bianchi, G., (2000), Performance analysis of the IEEE 802.11 distributed coordination function. *IEEE Journal on Selected Areas in Communications*, 18 (3), 535-547.
- [2] Bruno, R., Conti, M., and Gregori, E., (2002), Optimization of Efficiency and Energy Consumption in p Persistent CSMA Based Wireless LANs, *IEEE Transactions on Mobile Computing*, 1(1), 10-31.
- [3] Cali, F., Conti, M., & Gregori, E., (2000), IEEE802.11 Protocol: Design and Performance Evaluation of an Adaptive Backoff Mechanism, *IEEE Journal on Selected Areas in Communications*, 18 (9), 1774-178.
- [4] Cesana, M., Maniezzo, D., Bergamo, P., and Gerla, M., (2003), Interference aware (IA) MAC: an enhancement to IEEE802.11b DCF. Paper presented at the 58th IEEE Vehicular Technology Conference (VTC 2003-Fall).
- [5] Fall, K., & Varadhan, K., (2003), The ns Manual, from <<http://www.isi.edu/nsnam/ns>>

Analysis of Risk is a Need to Improve Software Quality: A Review

Nitin Deepak¹ and Shishir Kumar²

¹Asst. Professor, Amrapali Institute of Management & Computer Applications

²Jaypee University of Engineering & Technology, Guna

Abstract—It is truly difficult to evaluate how much any software is secure and to which extent. Assessment of Risk is a growing discipline on the context of improving quality of software projects. The density or complications to develop software and the related awareness and information require automated support for project managers in order to produce measure to reduce the risks in a project and analyze the impact of such measures. Unpredictable quality of third-party software creates a unique set of risks. Some aspects of software development, like risk management, are done throughout the whole project from beginning to maintenance. Also try to demonstrate the need for an intelligent risk assessment and management tool for both agile and traditional (or their combination) methods in software development.

Keywords: Software Risk, Software Quality, Risk Assessment.

INTRODUCTION

Some well known life cycle models are maintained yet but the problem with traditional software process models is that they do not deal sufficiently with the uncertainty. Barry Boehm recognized this and tried to incorporate the "project risk" factor into a life cycle model. The result is spiral model, which was presented in 1986 [BOEH86].

Software has become critical to evolution in almost all areas of human undertaking. The art of programming only is no longer sufficient to construct large programs. There are serious problems in the cost, suitable time, maintenance and quality of many software products.

Software Engineering has the objective of solving these problems by producing good quality, maintainable software, on time, within budget. To achieve this objective, we have to focus in a disciplined manner on both the quality of the product and on the process used to develop the product.

The focus is the identification of problems and the classification of these into different levels of risks, the aim being to eliminate high-risk problems before they threaten the software operation or cost. The unpredictable quality of third-party software creates a unique set of risks for software systems using COTS components. The CBS development process, then, should include risk management, which identifies high-risk items that can jeopardize system quality and attempts to resolve them as early as possible to ensure high quality and rapid delivery. The two major steps in risk management are

- Risk assessment: assess the probability and magnitude of loss for each risk item and prioritize risk items according to their expected loss; and
- Risk control: generate and execute plans to resolve the risk items.

Current risk assessment and management tools for software development projects are specific to the system or software development model used. There is need to develop tools which are system independent which can be used with any software development model (or combination thereof), agile or traditional.

To provide more effective ways of risk management, software models, which are intelligent and adaptive to risk management strategies, are, needed to improve the quality of the product.

Assessment of Risk is a growing obedience on the aspect to improve the software quality. The complexity to develop software and the related knowledge require automated support for project managers in order to analyze actions to reduce the project's risks and measure the impact of such actions. Here our objective is to study an approach for the assessment of risks in software projects. This research proposes to apply the technique to analyze project data and identify factors that are likely to impact team productivity and that could affect the team's ability to meet its schedule objective. In the article by Deborah Hartmann [5], according to the CHAOS 2004 report, only 29% of projects were finished successfully; 18% of the projects failed without giving any delivery, and the other part, 53% of the projects were finished with overtime or over their budget. The report goes on to say that the causes for failure of software development projects relate to rapid technology changes, in-flux business requirements, or failure to attack risks. The wasted revenue, argues Gopal Kapur [4], runs into trillions of dollars especially if one considers the lost opportunity costs which are not measurable. According to Erdognus [3], software development is rich in strategic opportunities, but it is ionsubject to multiple sources and high levels of uncertainty. Since development costs are irrecoverable, it is important to manage the uncertainty. "Risk in itself is not bad; risk is essential to progress, and failure is often a key part of learning. But we must learn to balance the possible negative consequences of risk against the potential benefits of its associated opportunity" [20]. When managed properly, uncertainty creates value. For software development projects, like in other sectors, there are risk management supportive tools, developed for risk management activities. Most of these tools generally provide electronic risk repository to record and update risks and making reports by compiling those records followed by analysis.

DEFINITION OF RISK

Risk can be defined as the possibility of suffering loss. In a software development project, the loss could be in the form of diminished quality of the software product, increased development costs, delayed completion, or failure. The risks involved vary; from managing individuals and their emotions, managing resources, and managing the changing environment. These can be strategic, financial, operational, employee, political, or economic risks. Van Scoy [27] contends that technical risk lies at the heart of many problems causing the failure of software programs. He defines technical risk as "the possibility that the application of software engineering theory, principles, and techniques will fail to yield the right software product. Technical risk is comprised of the underlying technological factors that may cause the final product to be: overly expensive, delivered late, or unacceptable to the customer." Johnson [28] distinguishes between three types of events: problem, issue, and risk. A problem, according to Johnson, is an event that has happened and is having a negative effect on the project, while an issue is an event certain to happen and will have a negative effect on the project.

RISK MANAGEMENT

Wiegiers [29] defines risk management as the application of appropriate tools and procedures to contain risk within acceptable limits by identifying, addressing, and eliminating potential problems before they damage a project. The Software Engineering Institute (SEI)'s [18] definition of risk management reads: "Continuous Risk Management is a software engineering practice with processes, methods, and tools for managing risks in a project. It provides a disciplined environment for proactive decision-making to: assess continuously what can go wrong (risk); determine what risks are important to deal with; implement strategies to deal with those risks. "The SEI definition emphasizes the continuous aspect of risk management, hence the name Continuous Risk Management (CRM). A project with risk management aims at early identification and recognition of risks and then actively changes the course of actions to mitigate and reduce the risk[13].

APPROACHES TO RISK ASSESSMENT

Several approaches to software risk management have since been proposed and used in the software engineering context. However, despite of several studies and experiences published about risk management, the software industry, in a general way, does not seem to follow a model to analyze and control the risks through the development of their products [8]. According to Johnson [10] two approaches to software project management can be identified, traditional and risk-oriented. The traditional approach is reactive in nature and deals with problems generic to all software projects systemically and project specific problems as they arise.

The later approach, however, is proactive as it seeks to Identify and manage unique aspects of a specific project before they impact the project.

Traditional Project Management (*Reactive*)

Deals with problems generic to all software projects systemically and project specific problems as they arise

SOFTWARE ENGINEERING INSTITUTE (SEI)'S SOFTWARE RISK MANAGEMENT (SRM) METHODOLOGIES

SEI's SRM methodologies risk management framework for software risk management is supported by three groups of practices:

1. Software Risk Evaluation (SRE)
2. Continuous Risk Management (CRM)
3. Team Risk Management (TRM)

The goal of this framework is to enable engineers, managers, and other decision makers to identify, sufficiently early, the risks associated with software acquisition, development, integration, and deployment so that appropriate management and mitigation strategies can be developed on a timely basis.

The developed software risk methodologies have three fundamentally different, albeit complementary, objectives:

1. Risk prevention
2. Risk mitigation and correction
3. Ensuring safe system failure

The following seven risk management principles are instrumental in the quest to achieve these three objectives:

1. *Shared Product vision*: For the common purpose sharing collective commitment.
2. *Teamwork*: Cooperation is must to achieve common goal and skills, knowledge and talent combination is needed for working together.
3. *Global Perspective*: Recognizing both the potentials i.e. potential value of opportunities and potential impact of adverse effects such as time consumption, cost overburden or failure to meet the deadlines etc.

4. *Forward-looking view*: Thinking for tomorrow and uncertainties and anticipating potential outcomes.
5. *Open Communication*: Encouragement of communication between all levels.
6. *Integrated Management*: making risk management an integral and vital part of project management and adapting risk management methods and tools to a project's infrastructure and culture.
7. *Continuous Process*: Maintaining constant inspection to find the risks routinely throughout all phases.

PROJECT MANAGEMENT BODY OF KNOWLEDGE (PMBOK)

PMBOK [26], by the Project Management Institute (PMI), is a project management guide, and an internationally recognized standard, that provides the fundamentals of project management as they apply to a wide range of projects, including construction, software, engineering, automotive, etc. According to this guide, risk management comprises a number of processes which are:

Risk Management Planning

- Deliverable is the Risk Management Plan
- Risk Identification

Risk categories:

- Technical
- Project management
- Organizational
- External

Qualitative Risk Analysis

- Define probability and consequences
- Data gathering
- Impact by objective
- Assumptions testing
- Data precision ranking

Quantitative Risk Analysis

- Individual and project risk
- Probability distributions
- Sensitivity and decision tree analysis
- Simulation methods

Risk Response Planning

Responses should be:

- Appropriate
- Cost effective
- Timely, realistic
- Agreed (funded)

Risk Monitoring and Control

- Ongoing, continuous action
- Risks monitored
- New risks identified
- Effectiveness of risk management evaluated

EXAMPLES OF RISK MANAGEMENT TOOLS

Riskit

Proposed in 1996 by Professor Jyrki Kontio, when he was a Researcher at the University of Maryland (UMD). It is a comprehensive risk management method based on theoretical principles with a comprehensive process definition that supports risk management activities.

Riskit process:

Main characteristics of a Riskit process:

- full operational definition of the process
- risk management, scope, focus, authority and procedures defined together
- a specific step for identifying and defining the goals of the project

Risk elements in Riskit:

Risk factor: a characteristic that affects the probability of a negative event occurring

- Risk event: a stochastic phenomenon that represents an occurrence of a negative incident.
- Risk outcome: represents the situation after the risk event has occurred and before any corrective action.
- Risk reaction: a possible action as a response to risk event and resulting risk outcome.
- Risk effect set: the final impact of a risk event to the project. Considering the impact of reaction, it describes characteristics which were affected.

Steps in Riskit

1. Risk management mandate definition
 - The scope and frequency of RM are defined.
 - All relevant stakeholders are recognized.
 - Output is the risk management mandate (why, what,when, who, how and for whom)
2. Goal review
 - The stated goals of the project are reviewed and refined, and implicit goals and constraints are defined explicitly.
 - Stakeholders' associations with the goals are analyzed.
 - Output is explicit goal definitions
3. Risk identification
 - Potential threats to the project are identified using multiple approaches.
 - Output is a list of "raw" risks
4. Risk analysis
 - Risks are classified and consolidated.
 - Risk scenarios for main risk events are completed.
 - Risk effects for all risk scenarios are estimated.
 - Probabilities and utility losses of risk scenarios are estimated.
 - Output is a completed risk analysis graph for all analyzed risks and ranked risk scenarios
5. Risk control planning
 - The most important risks are selected for risk control planning.
 - Risk controlling actions for those important
 - Risks are proposed.
 - Risk controlling actions are selected to be implemented.
 - Output is selected risk controlling actions
6. Risk control
 - Risk controlling actions are implemented.
 - Output is reduced risks
7. Risk monitoring
 - The risk situation is monitored.
 - Output is risk status information.

OPEN COMMUNICATION

Miler and Górski [14] recognized effective, continuous and open communication as the prerequisite for successful risk management. There is need, therefore, to provide the project stakeholders a broad and highly available communication channel through which they can communicate risk-related information. Open and unrestricted communication facilitates the key activities related to risk management. Such a channel should be able to "absorb" information generated by using diverse identification techniques such as checklists, questionnaires, brainstorming sessions and individual observations. Moreover, it should be constantly open to protect against the risk-related information being lost.

Overdependence on such a communication channel shifts focus to the identification of communicated or documented risks which might not necessarily be the risks inherent in the project activities. These 'latent' risks might actually be the ones to lead to project failure at a later stage. There is, therefore, need for intelligent tools which would capture such risks early without leaving everything to intra-team communication.

CONCEPTUALIZATION

Current approaches to risk management require the visualization and formalization of risk information. Kontio et al [9] observed that an essential element of software engineering risk management is the conceptualization of potential risks to a project. Conceptualisation, they argue, is the basis of risk analysis and, even more importantly, it strongly influences how risks are communicated and understood by participants in a project.

Their study indicated that a defined and sufficiently expressive visualization approach can help capture more of the risk information than less formal methods.

Licorish [12] also notes that social risks (risks inherent in human collaboration) are not adequately addressed by standard risk management theories and that evaluation reveals that these risks are also not considered by existing software tools.

INTELLIGENT RISK MANAGEMENT TOOLS

Intelligence (natural or artificial) requires the ability to learn, which is the ability to acquire knowledge and then use to use that knowledge to effect a change in behaviour. Two of the major weaknesses of repository-based risk management tools is their lack of deductive power and that they tend to be too generic. This greatly reduces their effectiveness in software development projects where each project is unique. Knowledge based tools, on the other hand, while exhibiting deductive capability, are tied to special technology or development methodologies. This reduces their independence from the technology and systems in their environment. In addition, in practice, software development is a hybrid of known, and often times not-so known processes.

There is need, therefore, of risk management tools which are intelligent and independent of the software development methodologies and systems technology. Such tools have the ability to learn and change behaviour depending on what exactly transpires during a project's life cycle. Further more, use of such a tool in future projects ensures continuity in the use of experience in risk management from previous projects.

Apart from the knowledge-based risk management tools which are based on artificial intelligence, there exist some tools based on mathematical modelling. Yacoub and Ammar [22] described a heuristic risk assessment methodology that uses dynamic metrics obtained from Unified Modeling Language (UML) specifications to determine the most risky components of the software architecture. It is mathematical analysis models derived from the UML diagram, and enables more attention to be placed in the areas of the system with highest risk.

REVIEW OF WORK ALREADY DONE ON THE SUBJECT (PRESENT & PAST STUDIES):

In the article by Deborah Hartmann [21], according to the CHAOS 2004 report, only 29% of projects were finished successfully; 18% of the projects failed without giving any delivery, and the other part, 53% of the projects were finished with overtime or over their budget. The report goes on to say that the causes for failure of software development projects relate to rapid technology changes, in-flux business requirements, or failure to attack risks.

The wasted revenue, argues Gopal Kapur [22], runs into trillions of dollars especially if one considers the lost opportunity costs which are not measurable.

According to Erdogmus [23], software development is rich in strategic opportunities, but it is subject to multiple sources and high levels of uncertainty. Since development costs are irrecoverable, it is important to manage the uncertainty. "Risk in itself is not bad; risk is essential to progress, and failure is often a key part of learning. But we must learn to balance the possible negative consequences of risk against the potential benefits of its associated opportunity" [20]. When managed properly, uncertainty creates value. For software development projects, like in other sectors, there are risk management supportive tools, developed for risk management activities. Most of these tools generally provide electronic risk repository to record and update risks and making reports by compiling those records followed by analysis.

Boehm [2] identified risk management as a basic discipline for software development projects. Hussey [5] described new and amplified risks incurred by globally distributed projects, which must drive the development of new tools and methodologies to mitigate those risks.

The increasing reliance on software systems and the increasing amount of software in systems constitutes an indication that overcoming the chronic problems of software development, such as cost overruns, project delays and unmet user requirements [Ropponen and Lyytinen 1997], is not only highly desirable but a priority for the economy. According to Klein and Jiang [2001], studies continue to indicate that about 85% of all projects end in failure. Furthermore, it is estimated that 31.1% of projects will be cancelled before they are ever completed [Boehm 2000]. Software development, given its diverse and abstract nature, offers unique challenges and risks [Moynihan 1997]. A formal risk management programme is a structured way of evaluating risks to the software development process. A typical risk management framework involves identifying and analysing the risks to a project and then implementing and monitoring measures to reduce them.

Kuipers [7] describes a tool to enable project risk assessment based on software source code analysis. Source code metrics are collected and analyzed to provide an overview of the software development status. A manager can use these metrics to support project management decisions based on development and testing information processed by their tool.

Alberts defines a methodology to assess project risks based on positive and negative project risks. Risk drivers are collected on the target project and a risk assessment algorithm is applied to calculate the project risk. The main contribution of this methodology consists of the extension point provided by risk drivers that can be added to support globally distributed software development projects.

We have also conducted a systematic literature review [6] about project management heuristics and about tool and methodological support for risk assessment on Global Software Engineering. The most common strategy we have found is the recommendation for common processes and tools over the different development sites around the globe.

Software risk management is an approach that attempts to formalise risk oriented correlates of development success into a readily applicable set of principles and practices [Ropponen and Lyytinen, 2000]. It incorporates techniques and guidelines to identify, analyse and control software risk. Risk management is aimed at taking counter measures to either prevent risks from affecting the project or to reduce their impact [Heemstra and Kusters, 1996], and should be viewed as a fundamental component of the project management process [Powell and Klein, 1996]. Incorporating risk management in the early stages of the acquisition life cycle allows the identification and analysis of risks, and establishes strategies to mitigate them, in order to control risks from beginning to end.

Although there are many approaches and techniques, software risk management is often neglected in real-world project management. A study by the Project Management Institute showed that risk management is the least practiced of all project management disciplines in the IT industry. In actual software projects, risks are often managed by intuition of project managers, and the complete risk management process is rarely followed. One of the main reasons for this phenomenon is that project managers lack practical techniques and tools to effectively manage software risks. Existing approaches and models for software risk management are rarely applied in actual software projects, because either they are too general to guide the operational risk management activities, or their applicability is limited to some special scenarios.

The models, frameworks and proposals (mentioned- check) give high importance to risk analysis in software acquisition and correlated services.

The widespread use of information services will only be accepted by users if their quality is of acceptable level. It is therefore of high interest to be able to estimate, or even measure the quality of a system under construction. UML is now a de-factor standard for modeling systems to be build.

Risk analysis and management methodologies lack the resources to adapt to the acquisition discipline in order to identify, manage, monitor and mitigate risks arising from the acquisition process.

CONCLUSION

This paper has shown the need for management of risk and share some tools to manage it in software project since the complex structure of risk management increases with the density or complications of the developed system. The need for risk management tools which are intelligent enough has also been demonstrated. Such tools would have the capacity to be used with any development methodology, whether traditional, agile, or even a combination of them.

REFERENCES

- [1] Alberts, C.; Dorofee, Audrey J.; Marino, Lisa. "Mission Diagnostic Protocol, Version 1.0: A Risk-Based Approach for Assessing the Potential for Success". SEI Technical Report CMU/SEI-2008-TR-005, March 2008.
- [2] Boehm, B. W. "Software Risk Management: Principles and Practices". In IEEE Software, Volume 8, Issue 1, 1991.
- [3] Ebert, C.; Murthy, Bvs Krishna; Jha, Namoo Narayan. "Managing Risks in Global Software Engineering: Principles and Practices," ICGSE, pp.131-140, 2008 IEEE International Conference on Global Software Engineering, 2008.
- [4] Hallegersberg, J.V.; Herrera, M. "Tool Support for Distributed Software Development: The past - present - and future of gaps between user requirements and tool functionalities". In Tools for Managing Globally Distributed Software Development (TOMAG 2007), Munich, Germany, 2007.
- [5] Hussey, J. M.; Hall, S. E. "Managing Global Development Risk". Auerbach Publications, FL, USA, 2008. [6] Kitchenham, B.A. D.; T. Jorgensen, M. "Evidence-based Software Engineering". Proceedings. 26th International Conference on Software Engineering, 2004.
- [6] Kuipers, T; Deursen, A. van . Source-based software risk assessment. In International Conference on Software Maintenance, Washington, DC, USA, 2003.
- [7] Lima, Adailton; Avritzer, Alberto. "An Empirical Approach for the Assessment of Scheduling Risk in a Large Globally Distributed Industrial Software Project". In Fourth IEEE International Conference on Global Software Engineering, Limerick, Ireland, 2009.
- [8] Prikladnicki, R.; Yamaguti, M. H. "Risk Management in Global Software Development: A Position Paper". In Third International Workshop on Global Software Development (GSD 2004), Edinburgh, Scotland, UK, 2004.
- [9] Silva, Edmundo de S. e; Leão, Rosa M. M.; Silva, Ana P. C. da; Rocha, Antonio A. de A.; Duarte, Flávio P.; Fernando J. S. Filho, Guilherme D. G. Jaime, Richard R. Muntz. "Modeling, Analysis, Measurement and Experimentation with the Tangram-II Integrated Environment", In International Conference on Performance Evaluation Methodologies and Tools, pp.1-10, Vol. 180, 2006.
- [10] ROPPONEN, J., AND LYYTINEN, K. 1993. Can Software Risk Management Improve System Development: An Exploratory Study. European Journal of Information Systems, Vol 6, 41-50.
- [11] Licorish S., 2007, Tool Support for Social Risk Mitigation in Agile Projects , Thesis, Auckland University of Technology ,Auckland , June, 2007.
- [12] HEEMSTRA, F.J. AND KUSTERS, R.J. 1996. Dealing with Risk: A Practical Approach. Journal of Information Technology, Vol 11, 333-346.
- [13] Miler J., Górski J., Towards an integrated environment for Risk Management in Distributed Software Projects, 7th European Conference on Software Quality, Finland, 2002
- [14] Aubert, B., Patry, M., Rivard, S., & Smith, H., "IT out-sourcing risk management at British Petroleum", in System Sciences, 2001. Proceedings of the 34th Annual Hawaii International Conference on, 2001, p. 10 pp.

- [15] Baldwin, A., Beres, Y. & Shiu, S., "Using assurance models to aid the risk and governance life cycle" Springer Netherlands, vol. 25, pp. 128–140, Enero 2007.
- [16] Charette, R.N., "Why software fails", IEEE Spectrum, 2005. 42(9): pp. 42–49.
- [17] Dedolph, F.M., "The Neglected Management Activity: Software Risk Management", Bell Labs Technical Journal, 2003. 8(3): p. 91–95.
- [18] Pandian, C.R., Applied Software Risk Management: A Guide for Software Project Managers, Auerbach Publications, 2006.
- [19] ISO/IEC TR 9126–2: Software Software engineering –Product quality–Part 2: External metrics, 19–12-2000.
- [20] Hartmann D. 2006, Interview: Jim Johnson of the Standish Group, viewed 08 March 2009.
- [21] Gopal K. 1997, IT project management can succeed!, Managing Office Technology, Vol. 42, Issue 7.
- [22] Erdogmus H. n.d., Aligning Software Development Investment Decisions with the Markets, National Research Council of Canada.
- [23] Boban M., Pozgaj Z., & Sertic H., 2003, Strategies for Successful Software Development Risk Management, Management Vol. 8, 2003, 2, pp. 77–91
- [24] Hartmann D. 2006, Interview: Jim Johnson of the Standish Group, viewed 08 March 2009, <http://www.infoq.com/articles/Interview-Johnson-Standish-CHAOS>
- [25] Kwak Y. H., & Stoddard J., Project risk management: lessons learned from software development environment, Technovation 24, 2002
- [26] Project Management Institute (PMI)—Guide to the Project Management Body of Knowledge (the PMBOK(R) Guide) 2000
- [27] Van Scoy Roger L., Software Development Risk : Opportunity, Not Problem. SEI, CMU/SEI-92-TR- 30, ADA 258743, September 1992
- [28] ohnson D. L., Risk Management and the Small Software Project, viewed 4 May 2009 <http://www.sei.cmu.edu/iprc/sepg2006/johnson.pdf>
- [29] Wiegers K., Know Your Enemy: Software Risk Management, Software Development, vol. 6, no. 10 (October 1998).
- [30] Software Engineering Institute, Risk Management Overview, viewed 4 May 2009, www.sei.cmu.edu/risk/overview.html#definition

Service-Oriented Computing & its Framework

Vinay Goyal¹ and Amit Jain²

¹Professor (CSE) Jind Institute of Engineering & Technology, Jind (Haryana) India

²Research Scholar, Teerthanker Mahaveer University, Moradabad (Uttar Pradesh) India

Abstract—Software development has moved from the traditional design techniques to more dynamic design mechanisms. These include dynamic service selection and composition in order to fulfill a user's request. Business processes are automated by a series of business process-specific services (top layer) that share a pool of business process-agnostic services (bottom layer). These layers correspond to the task, entity, and utility service models. Service-orientation places an unprecedented emphasis on reuse. By establishing a service inventory with a high percentage of reusable and agnostic services, we are now positioning those services as the primary (or only) means by which the solution logic they represent can and should be accessed. This research paper presents a deep insight into the analytical study of service-orientation and its features.

Keywords: SOC, MBFSsystem, Synchronization, ND, Web Service.

INTRODUCTION

Service-oriented computing is the new motion rising from growing web services and the acceptance of essentials from fundamental web technology. Additional complexity, in reply to business necessities, makes it more complex to be utilized or to be managed. Many legacy systems perform core business functions [4]. In particular, business processes require flexibility and real-time alteration in the visage of altering business necessities, inclusion of optional services, and locating apt replacement when those desired are engaged.

The hopeful advances in service orientation encompass productive vision for the technologies that will influence the Internet over the subsequent years and the innovative functionalities they will involve. The computational paradigm of service-orientation allows a direct mapping of business processes to IT-services [1].

A lot of distributed networked applications are based on software services. This can be realized in terms of advancement of technology from web 3.0 to the future Internet, from cloud computing to the Internet of things etc. Such applications can be dynamically organized, customized, and poised so as to generate fundamentally latest kind of distributed software applications that will outline the web of the future.

To accomplish the revelation, these applications should be proficient to converse, reconfigure at runtime, acclimatize to their environment, and dynamically combine sets of uncomplicated, specific, self-sufficient services into more multifaceted, added-value business services.

This requires intense changes in the way we plan, organize, and handle software systems, replacing on hand waterfall-like engineering techniques with advancements that incorporate functionalities and technicalities into operational systems that comprise of dynamic, distributed, mutually dependent processes.

GENERATION OF NEW SOFTWARE

The procedures for scheming and production of the new generation of open software ought to, own numerous key features:

- They should extend up to engage in large-scale applications comprising of numerous specifications.
- As applications are abrupt in size, they ought to maintain self-governing software, i.e. the engineered application must "take care of them". The advancement should thus unambiguously appear in opinion polls which facilitate the association of dynamic approach with design-time models and entity.
- To augment application simplicity, procedure must comprise individuals in the review and maintenance arena, permitting impending human interference in the software control procedures.
- Phenomenon must consent to optional ways of making into the design process, in order to involve existing systems—and allow the developers to modify the unknown aspects of it within in the given time along with keeping in line with several improvement technique and requirements.
- They must instill a phenomenon to maintain and conduct the utilization of automatic tools.
- They should involve in and include accessible untied principles, agreeing for expansion to be easily incorporated.
- The generic concept of a service-oriented architecture (SOA), which today is most commonly, implemented using Web Services as the technology platform [2]. The objective is to evolve the latest techniques to tackle with the challenge.

THE MODEL BASED FRAMEWORK

The model based framework (MBF) combines with synchronization and executive method, for extending aid for extremely active and unbolted collection of services.

This framework expands recent development in engineering by involving a major part of three phases in the plan and running of disseminated structure: Conceptual, Synchronization & Business level.

The *conceptual level* supports the notion depiction (ND) of services and the range of the most suitable web service (WS) for a known assignment based on concepts. This efficiently manages advanced stage, active service composition [3].

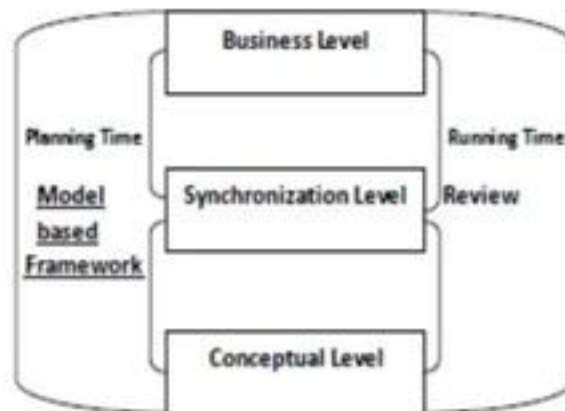


Fig. 1: Model Based Framework

For exceedingly active services, the conceptual explanation simplifies the process of locating similar services when earlier recognized service is occupied or when additional apt services are indexed simultaneously. This phase is also liable for observing service happenings.

The *synchronization level* identifies the outline of interface between services, altering the managerial depiction (including information stream, restraint, responsibilities and mediators) approaching from the corporate level into synchronization phase. Using established development paraphernalia, we develop an approach to repeatedly blend strategy to realize corporate objectives. There is a sincere effort in this level in relation to disseminated manner, making use of the conceptual level, and examine via logs the strategies already implemented to give review to the designing process and subsequently, the business phases.

The *business level* encourages perspective for synchronization and concepts through an open depiction of the system's corporate schema. This is accomplished by replicating the business stakeholders and their associations. Hence, the procedure of obtaining the prescribed objective, necessities, and margins can be termed as intervening approach.

In addition, there are tools and methods for the validating and examining business stipulation. There is also provision for handling amendment to the business schema (such as restructuring or modifying the policy of control) coming up from suggestions by either the synchronization or conceptual phase. Lastly, this phase gives methodologies for norm-oriented business plan, by providing bendable behavioral authority in situations where conventional approach does not shape in well.

These three phases have been combined by using the model-based framework (MBF), both at planning time and running time. This supports mechanical conversion from the models at each of the three phases to several intentional platforms, understanding a form of feed-forward from planning to execution. At implementing time, associations between the phases is in the reverse track, apprehend review from execution to planning, with dealings at the conceptual level providing information into the synchronization (leading to re-designing) and business (leading to restructuring) levels.

This multilevel approach makes the framework mainly suitable for situations where alterations are likely to happen at conceptual or existing level. It also convenes the requirements of extremely active services, with novel services inflowing the system and obtainable services parting it above the existence of the service composition execution. Suppose, when there is a noteworthy alteration in, say, the corporate schema, the conceptual-level arrangement is automatically restructured, efficiently by joining the prevailing services in recent manner to exhibit the business alterations. Also there can be scenario, where suppose the automatic adjustment of more conceptual phases, when more existing ones experience important modifications (such as due to the redundant malfunctioning of a service). Moreover, this framework lets more existing levels acclimatize within themselves, while maintaining the system's in general objectives and intention apparent.

IMPLEMENTING THE FRAMEWORK

To support the framework, Modeling Framework supported by Java was used to generate a variety of resources, which have been collectively joined into a solitary enclose called MBFSystem. The toolset incorporates planning gear for model conception and the designing of system functionalities, attached with the dynamic tools vital to organize a modeling framework.

Training Cost

Training of employees to use an EHR system is expensive. The lack of standardized terminology and regular changes in system architecture will increase the training cost of using EHR. Frequent changes in technology will also require the regular training sessions for EHR users which may lead the high training cost.

CONCLUSION

EHR provides the systematic collection of electronic medical records about the patients. Involvement of CDSS and evidence based medicine are the areas of positive changes in health care terminology. There must be more involvements by government and the private sector to make changes where possible to motivate and provide incentives to accelerate the development of solutions to overcome the barriers. There are many factors that must be considered before an organization should implement an EHR. The organization must first obtain as much information as possible before EHR implementation.

REFERENCES

- [1] Noshir Contractor and Bradford W. Hesse, (2010), "Cyber infrastructure for Public Health", ACM.
- [2] Hammond, W. Ed, (1987), "Patient Management System-Early Years", ACM.
- [3] Ramakrishnan, S., (2010),"Health Informatics in India", 5 September 2008, Symposium on Medical informatics Standards in Indian Context by CDAC, ACM.
- [4] Shepherd, Michael," Challenges in Health Informatics", © 2007 IEEE.
- [5] Ramkumar, Dr. P.S., "Tele-Health In India", International Telecommunication Union (ITU), Geneva.

MBFSystem comprises of editors for modeling businesses (to provide background), measures (to show system potential), responsibilities (to indicate achievement dealings and reliance), strategy (to indicate conceptual workflows), agent (to represent the acting mechanism on the synchronization level), and conceptual similes (to factor the existing functionalities supported by a several services).

The expansion method is unswervingly aided by the above description that helps system engineers through the planning process. Since all the models in the framework are meta-model-based, alteration between the several models is moderately simple. The toolset comprises a complete collection of set of model-to-model makeover to create components of the models based on other models on hand. Also, the toolset comprises of model-to text alteration for creating the source code for the agents and services.

There is also information regarding the interaction between different schemas and also, there is description of events model, specifying the particulars of a deliver messages action.

For implementation, MBFSystem provides the remote set-up, deployment, and operations of model based systems. Furthermore, it comprises of mechanism to assess and handle the operational system by way of event records and observing (to analyze the outcome of the operational system) and the workflow revelation and analysis tools (to envisage and assess the system functionalities).

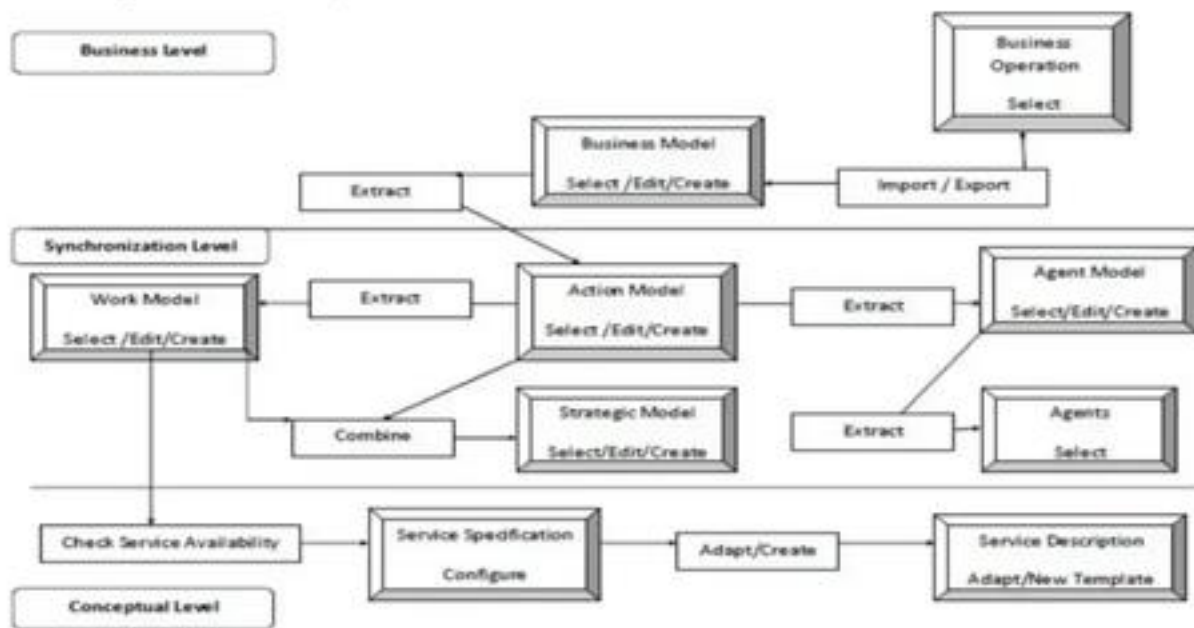


Fig. 2: Planning Phase

CONCLUSION

Today's computing necessitates emerging services available as quickly as possible but this is not so easy to achieve since enormous amount of functionality is somehow buried in billions of dollars worth of existing code. Service-Oriented Computing (SOC) may help tackle this problem by decomposing monolithic legacy systems into loosely coupled parts wrapped by service adapters. From these prototypes we have gained important insights into the implications of our design decisions and their advantages and disadvantages. These issues will be given further attention in our future research.

REFERENCES

- [1] Christian Schneider, Frederic Stumpf, Claudia Eckert "Enhancing Control of Service Compositions in Service-Oriented Architecture," IEEE Conference 2009 Proceedings.
- [2] T. Erl. "Service-Oriented Architecture," chapter 3, pages 31-59. Prentice Hall PTR, 6th Edition, 2006.
- [3] Terry R. Payne "Agents-Adaptable, Organization Aware, Service-Oriented Computing," Proceedings of IEEE Intelligent Systems 2010.
- [4] Richard Millham "Migration of a Legacy Procedural System to Service-Oriented Computing Using Feature Analysis," Proceedings of the International Conference on Complex, Intelligent & Software intensive systems, IEEE 2010.

Design a Web Crawler using VB.NET Technology

Sushil Kumar¹, Bharti Mittal² and Deepak Kumar³

¹SGT Institute of Engineering & Technology

²World College of Technology and Management

³World College of Technology and Management

Abstract—The number of web pages is increasing into millions and trillions around the world. To make searching much easier for users, web search engines came into existence. Web Search engines are used to find specific information on the World Wide Web. Without search engines, it would be almost impossible to locate anything on the Web unless or until a specific URL address is known. This information is provided to search by a web crawler which is a computer program or software. Web crawler is an essential component of search engines, data mining and other Internet applications. Scheduling Web pages to be downloaded is an important aspect of crawling. Previous research on Web crawl focused on optimizing either crawl speed or quality of the Web pages downloaded. While both metrics are important, scheduling using one of them alone is insufficient and can bias or hurt overall crawl process. This paper is all about design a new Web Crawler using VB.NET Technology.

Keywords: Creativity, Innovation, Entrepreneurship, Entrepreneurs.

OVERVIEW

Entrepreneurs implement creative ideas to introduce innovative products or services, or to deliver products or services in a new, more efficient, and hence innovative way. Innovation in New Product Development could include upgrading an existing product or developing a totally new concept to create an original and innovative product. This is also true for services and processes, thus innovation is recognized in the literature as ranging from the incremental to the radical. There is broad agreement that innovation should be present in all aspects of an organization and that it should be a mindset or a way of life. Innovation should permeate through the various elements of the organization's business model in order to make it harder to be copied by competitors. Therefore, innovation is not only measured by the new products or services offered by an enterprise but also by new and more efficient ways of developing, producing or delivering products or services.

It is argued that creativity is not required solely in the domain of certain sectors or departments, or only in the development of new products or services, but is needed at every level of every type of organization. Creativity is seen as going beyond new products, new services and new and improved processes. Therefore if one can "better organize *one's* day or write a report in a new or more effective way, then this is every bit a creative act".

INTRODUCTION

Innovation is the tool of entrepreneurship. In addition, both innovation and entrepreneurship demand creativity. Creativity is a process by which a symbolic domain in the culture is changed. New songs, new ideas, new machines are what creativity is about. Creativity is the ability to make or otherwise bring into existences something new, whether a new solution to a problem, a new method or device, or a new artistic object or form. Creativity as new and useful. Creativity is the act of seeing things that everyone around us sees while making connections that no one else has made. Creativity is moving from the known to the unknown. Culture exerts a negative force on creativity however, "were it not for creativity, culture itself would not be created."

No entrepreneur or enterprise, however successful and big, can continue to hold a place of leadership unless it recognizes that modern business operates in a world of galloping change which creates new problems, risk and opportunities and for which they have to mobilize the enterprise's resources before changes make their impact felt. To do successfully, the entrepreneur and enterprise should know where this firm is going and how the firm will get there. This is turn requires a clear definition of the company's business which will enable it to continually adopt operations to the realities of the market place, 'the very corner stone of survival and growth"

Innovation is defined as adding something new to an existing product or process. The key words are adding and existing. The product or process has already been created from scratch and has worked reasonably well. When it is changed so that it works better or fulfils a different need, then there is innovation on what already exists. Innovation is the successful exploitation of new ideas.

All innovation begins with creative ideas. Creativity is the starting point for innovation. Creativity is however necessary but not sufficient condition for innovation. Innovation is the implantation of creative inspiration.

CREATIVITY

Creativity is marked by the ability to create, bring into existence, to invent into a new form, to produce through imaginative skill, to make to bring into existence something new. Creativity is not ability to create out of nothing (only God can do that), but the ability to generate new ideas by combining, changing, or reapplying existing ideas. Some creative ideas are astonishing and brilliant, while others are just simple, good practical ideas that no one seems to have thought, of yet.

Everyone has substantial creative ability including you the reader. So you should count yourself and believe it that you are a creative genius. All you need is to be reawakened and be highly committed to creativity. I want you to start thinking now, in the process something new will flow. Explore that something new today and you will be a different personality tomorrow.

Creativity is also an attitude, the ability to accept change and newness, a willingness to play with ideas and possibilities, a flexibility of outlook, the habit of enjoying the good, while looking for ways to improve it, we are socialized into accepting only a small number of permissible or normal things, like chocolate-covered strawberries, for example. The creative person realizes that there are other possibilities like peanut butter and banana sandwiches, or chocolate-covered prunes.

Entrepreneurs take bold creative steps but situations encourage creativity. Creativity is, however, enhanced when people have some freedom, but not too much; high internal commitment to the task; but not too high a commitment; high proportion of intense rewards, but some extrinsic rewards as well; some competition but not winner take-all competition. Entrepreneurial activity depends on the process of innovation following creativity, not on creativity alone.

INNOVATION

Innovation is the process of bringing the best ideas into reality, which triggers a creative idea, which generates a series of innovative events. Innovation is the creation of new value. Innovation is the process that transforms new ideas into new value- turning an idea into value. You cannot innovate without creativity. Innovation is the process that combines ideas and knowledge into new value. Without innovation an enterprise and what it provides quickly become obsolete.

Innovation is fostered by information gathered from new connections; from insights gained by journeys into other disciplines or places; from active, collegial networks and fluid open boundaries. Innovation arises from organizing circles of exchange, where information is not just accumulated or stored, but created. Knowledge is generated a new from connections that were not there before. Innovation requires a fresh way of looking at things, an understanding of people, and an entrepreneurial willingness to take risks and to work hard. An idea doesn't Become an innovation until it is widely adopted and incorporated into people's daily lives. Most people resist change, so a key part of innovating is convincing other people that your idea is a good one – by enlisting their help, and, in doing so, by helping them see the usefulness of the idea- Art Fry.

Creative ideas are not enough for your business to survive. You need a process organization and culture that will help you maximize your creative assets. This is innovation capability that helps your pull together the best thinking within your business, enabling you to connect the organization dots.

Shapiro argues that perpetual and pervasive innovation is the key to long –term sustainable success in the relentless competition for customers. To survive any competition, you must rapidly and repeatedly re-invent yourself. The road map to reinvention starts by applying the seven R's.

1. Rethink your underlying assumptions.
2. Reconfigure how you carry out work.
3. Resequence when work takes place
4. Relocate where work is done to cut down on handoffs and delays.
5. Reduce the frequency of carrying our specific activities.
6. Reassign who does the work by asking if anyone else could achieve the same result more effectively and efficiently.
7. Retool the technology that supports getting the work done. Could new software and automated equipment transform our ways of working?

CREATIVITY AND INNOVATION IN AN ENTREPRENEURIAL ORGANIZATION

Growth and development cannot be sustained without additional innovations (usually in the product or services or in its marketing) with additional innovations, firms become "glamorous" Introducing new products is usually seen as part of the process of innovation, which is itself seen as the engine driving continued growth and development.

The "winning performance" of the entrepreneur and the organization focuses on.

- Competing on quality not prices:
- Domination of a market niche;
- Competing in an area of strength
- Having tight financial and operating controls:

While successful businesses will each employ their own strategy, they achieve complete advantage through acts of innovation. Learning and problem-solving are common activities in many working environments today, but some people believe that true entrepreneurship occurs when individuals ignore the established ways of thinking and acting and seek novel ideas and solutions that can meet customers' needs Entrepreneurship is, therefore, the innovatory process involved

in the creation of an economic enterprise based on a new product or service which differs significantly from products or services offered by other suppliers in content or in the way its production is organized nor in its marketing.

It has been argued that small businesses have a greater proclivity to innovate than their large counterparts and are, therefore, crucial in helping a country respond to myriad changes in the economic, technological and social environment.

For instance, the OECD points out that small firms are innovative in different ways and are especially active in developing new approaches to management and marketing. To grow and prosper, most enterprises need to constantly improve their existing products and services through continuously innovating needed changes: and for survival of the enterprise, must also need to create new products and services to meet yet unfulfilled needs. Enterprises that rely exclusively on innovation will prosper until their products and services "ran out of gases and become obsolete and non-competitive. On the other hand, enterprise that are totally creative will have their new products and services ready to launch, but often too few current products sufficiently up-to-date and competitive to generate the cash needed to fund their creativity.

Changes are that the very successful leaders of the future will be more likely to make creativity and innovation a strategic priority in their organization. In today's environment where competition requires business enterprises to be distinct and meet customer needs with better or never products and organization becomes in critical necessity Joseph Schumpeter views innovation as the source of success in the market economy, a view that is reinforced by today's changing and competitive environment. The organization that is not creative and innovative cannot survive in the market place. Thus, entrepreneurs and enterprises are continuously creative and innovative to remain relevant to the customers, which is the purpose of every business.

CONCLUSION

Successful entrepreneurs require an edge derived from some combination of a creative idea and a superior capacity for execution. The entrepreneur's creativity may involve an innovation product or a process that changes the existing order. Or entrepreneur may have a unique insight about the course or consequence of an external change. Entrepreneurship is the vehicle that drives creativity and innovation. Innovation creates new demand and entrepreneurship brings the innovation to the market. Innovation is the successful development of competitive edge and as such, is the key to entrepreneurship.

Creativity and Innovation are at the heart of the spirit of enterprise. It means striving to perform activities differently or to perform different activities to enable the entrepreneur deliver a unique mix of value. Thus the value of creativity and innovation is to provide a gateway for astute entrepreneurship—actively searching for opportunities to do new things, to do existing things in extraordinary ways. Creativity and Innovation therefore, trigger and propel first-rate entrepreneurship in steering organization activities in whatever new directions are dictated by market conditions and customer preferences, thereby delighting the customers to the benefit of the stakeholders. Innovation also means anticipating the needs of the market, offering additional quality or services, organization efficiently, mastering details, and keeping cost under control.

No doubt, the current economic environment is a volatile and violent one. The new environment demands renewed dynamism of approach. Creativity and innovation is the new name of the game. Only the discerning organizations can manage the changes inherent in the new environment. It is the duty of the entrepreneur to keep his/her organization lean, young, flexible, and eager for new things to continuously delight the customers, which is the purpose of every business.

REFERENCES

- [1] Amabile, T. M., (1998), "How to Kill Creativity," *Harvard Business Review*, Sept-Oct.
- [2] Bhide, A., (1994), "How Entrepreneurs Craft Strategies That Work," *Harvard Business Review*, Mar-Apr.
- [3] Bridges, S., O'Neill, K. and Cromie, S., (2003), *Understanding Enterprises: Entrepreneurship and Small Business*, New York: Palgrave Macmillan.
- [4] Chakravorti, B., (2004), "The New Rules for Bringing Innovations to Markets," *Harvard Business Review*, March.
- [5] Drucker, P. F., (1985), *Innovation and Entrepreneurship*, London: Pan Books Ltd.
- [6] Drucker, P. F., (2002), *Management Challenges for the 21st Century*, London: Butterworth Heinemann.
- [7] Harris, R., (1998), "Introduction to Creative Thinking," data retrieved from <www.vitualsalt.com>.
- [8] Sikszent, M. C., (1997), *Creativity: Flow and the Psychology of Discovery and Invention*, New York: Harper Will Collins Publishers, Inc.
- [9] Okpara, F. O., (2000), *Entrepreneurship: Text and Cases*, Enugu: Precision Printers And Publishers.
- [10] Drucker, P. F., (1995), *Management in a Time of Great Change*, Oxford: Butterworth Heinemann.
- [11] Meredith, G. G., Nelson, R. E. and Neck, R. A., (1991), *The Practice of Entrepreneurship*, Lagos: University Press.
- [12] Okpara, F. O., (2006), *The Practice Of Entrepreneurship*, Enugu: Precision Publishers Ltd.
- [13] Thompson, J. L., (2001), *Strategic Management*, Canada: Thomson Learning.
- [14] Schumpeter, J. A., (1934), *The Theory of Economic Development*, Cambridge, USA: Harvard University Press.
- [15] Porter, M. E., (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*. USA: Free Pre

Distributed Sensor Network for Nuclear Reactor based on Labview

Pratibha Mondal¹ and G. Vimala Rani²

¹M.E (PCI) Student Dept. of Electronics and Instrumentation Engg. Hindustan University Chennai, India

²M.E (AE) Assistant Professor Dept. of Electronics and Instrumentation Engg. Hindustan University Chennai, India

Abstract—The paper presents a dynamic safety model for a Nuclear Reactor using data acquisition, so vibration and temperature are the most important parameters which we have to monitor and control in continuous process industries. The total process consist of two major parts, such as sensing of parameters using sensors and hence the controlling the same using real time controlling software. The use of LabVIEW (Laboratory Virtual Instrumentation Engineering Workbench) of National Instruments, USA for controlling of the same For this purpose we employ the usage of LabVIEW controlling software using Virtual Instrumentation. The analogue output of sensors is fed to the analogue to Digital Converter (ADC) which converts it into a Digital signal. This signal is fed to the LabVIEW system using a to design and implement a RS485 based embedded network for monitoring and controlling (DAQ) s. This is a flexibility provided by NI (National Instruments) LabVIEW software for remote sensing and monitoring. The parameter (here, vibration and Temperature) set point is fixed based on the process. The generated error signal can be recorded in an array and graphical analysis can be performed using the Toolkit VI present inside the software. Through the use of continuously recorded output, process engineers can pinpoint the time and machine in which the temperature and vibration goes out of the specified range and identify the damage on the nuclear reactors. The generated error signal can be recorded in an array and graphical analysis and controlling can be performed using the FUZZY LOGIC AND ON -OFF CONTROLLER Toolkit. Through the use of continuously recorded output, process engineers can pinpoint the time and machine in which the temperature goes out of the specified range and identify the chemical products affected.

INTRODUCTION

Globally, robust growth is forecast in the nuclear power industry due to a convergence of factors. In addition to projected increases in future electricity consumption, especially in emerging economies. One concern with operating nuclear power plants beyond 60 years is the appropriateness of periodic inspection for basis for this strategy is of the ASME Boiler and Pressure Vessel Code which was devised to manage fatigue degradation, characterized by slow and linear growth to failure. Operating experience has shown, however, that other significant degradation mechanisms exist which challenge this underlying philosophy. There exist degradation mechanisms characterized by long incubation periods (during which, they

remain undetectable) followed by a rapid growth phase. Design of reactor monitoring system based on LabVIEW and intelligence instruments such as MEMS technology. It has great significance that monitoring temperature and Vibration of reactor walls at the time of experiments and industrial production. In this paper, computer and intelligence instrument are connected by RS485 into a distributed control system, by the use distributed control system we can get the different parameters from all the part of the reactor at the same time, than develop the on-line monitoring software for reactor based on LabVIEW platform, It has data collection, display, storage and analysis functions, and it can alarm when the value of temperature or pressure exceeds the upper limit. In this paper, a dynamic model, launched by means of finite element method, as well as a field experiment will be presented to investigate the relationship between the dynamic characteristics and the longitudinal and horizontal stress generated by temperature variation from the walls of the reactors.

PROPOSED BLOCK DIAGRAM

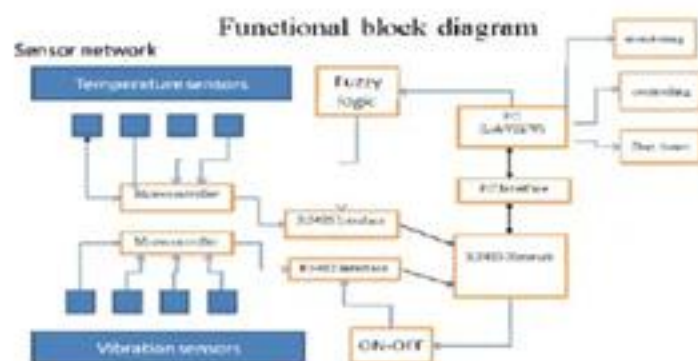


Fig. 1

From the proposed block diagram of MEMS based vibration and temperature measurement using distributed networking system based on Virtual instrumentation called LabVIEW for nuclear reactor safety.

- To design and implement a RS485 based embedded network for monitoring and controlling industrial applications.
- In this project a RS485 network for temperature and vibration monitoring will be used.
- LabVIEW is used for graphical presentation of the data collected from the RS485 network.

Sensor Integration

Inertial Systems are multi-axis sensor packages that measure the inertial forces experienced by the movement of an object in free space. The most frequent applications for inertial systems are navigation, attitude measurement and platform stabilization. MEMSIC offers a wide range of inertial products that are based on the combination of MEMS acceleration and angular rate sensor technologies, GPS receiver or air data computer to enhance overall functionality and performance, however, all of MEMSIC's inertial systems are designed to operate without the need for external aiding.

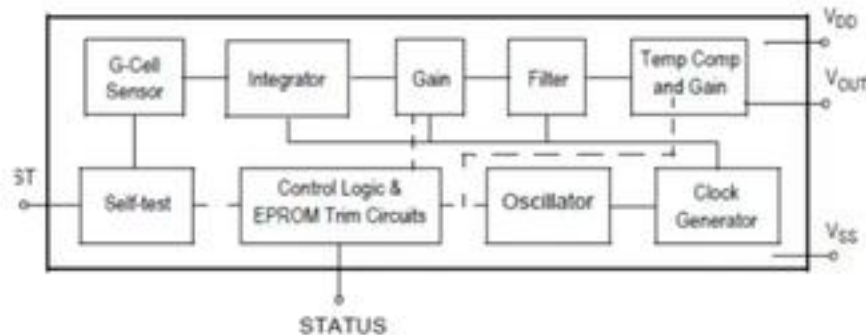


Fig. 2: Simplified Accelerometer Functional Block Diagram

PIC 16F877A MICROCONTROLLER

PIC16F877A is a small piece of semiconductor integrated circuits. The package type of these integrated circuits is DIP package. DIP stand for Dual Inline Package for semiconductor IC. This package is very easy to be soldered onto the strip board. However using a DIP socket is much easier so that this chip can be plugged and removed from the development board.

Special Microcontroller Features:

- 100,000 erase/write cycle Enhanced Flash program memory typical
- 1,000,000 erase/write cycle Data EEPROM memory typical
- Data EEPROM Retention > 40 years
- Self-reprogrammable under software control
- In-Circuit Serial Programming™ (ICSP™) via two pins
- Single-supply 5V In-Circuit Serial Programming
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code protection
- Power saving Sleep mode
- Selectable oscillator options
- In-Circuit Debug (ICD) via two pins

RS485 DISTRIBUTED CONTROL NETWORK

RS-485 is a US-based telecommunications standard for binary serial communications between devices. It is the protocol, or set of specifications, that needs to be followed to allow devices that implement the standard to speak to each other. The protocol is an updated version of the original serial protocol known as RS-232. While the RS-232 standard allowed for the connection of two devices through a serial link, RS-485 allows for serial connections among more than two devices on a networked system.

A RS-485 compliant network is a multi-point communications network. The RS-485 standard specifies up to 32 drivers and 32 receivers on a single, two-wire bus. New technology has since introduced "automatic" repeaters and high-impedance drivers and receivers so the number of drivers and receivers can be extended to hundreds of nodes on a network. RS-485 drivers are now even able to withstand bus contention problems and bus fault conditions.

A RS-485 network can be constructed as either a balanced two-wire system or a four-wire system. If a RS-485 network is constructed as a two-wire system, all of the nodes have equal ranking. A RS-485 network constructed as a four-wire system has one node designated as the master, and the remaining nodes are designated as slaves. Communication in such a system is only between master and slaves and not between slaves. This approach simplifies the software protocol that needs to be used, at the cost of increasing the complexity of the wiring system slightly.

VIRTUAL INSTRUMENTATION

Virtual instrumentation is an interdisciplinary field that merges sensing, hardware and software technologies in order to create flexible and sophisticated instruments for control and monitoring applications. There are several definitions of a virtual instrument available in the open literature. Santori defines a virtual instrument as "an instrument whose general function and capabilities are determined in software". Goldberg describes that "a virtual instrument is composed of some specialized subunits, some general-purpose computers, some software, and a little know-how". Although informal, these definitions capture the basic idea of virtual instrumentation and virtual concepts in general - provided with sufficient resources, "any computer can simulate any other if we simply load it with software simulating the other computer". This universality introduces one of the basic properties of a virtual instrument - its ability to change form through software, enabling a user to modify its function at will to suit a wide range of applications. The concept of *virtual instrumentation* was born in late 1970s, when microprocessor technology enabled a machine's function to be more easily changed by changing its software. The flexibility is possible as the capabilities of a virtual instrument depend very little on dedicated hardware - commonly, only application-specific signal conditioning module and the analog-to-digital converter used as interface to the external world. Therefore, simple use of computers or specialized onboard processors in instrument control and data acquisition cannot be defined as virtual instrumentation. Increasing number of biomedical applications use virtual instrumentation to improve insights into the underlying nature of complex phenomena and reduce costs of medical equipment and procedures. Although many of the general virtual instrumentation concepts may be directly used in biomedical measurements, the measurements in the medical field are peculiar as "they deal with a terribly complex object—the *patient*—and are performed and managed by another terribly complex instrument—the *physician*". In this chapter we describe basic concepts of virtual instrumentation, as well as biomedical applications of virtual instrumentation. In the second section we give a brief history of virtual instrumentation. The architecture of a virtual instrument and contemporary development tools are described in the third section. In the fourth section we describe the organization of the distributed virtual instrumentation. Finally, we present some biomedical applications of virtual instrumentation.

GRAPHICAL USER INTERFACES (GUI)

Graphical user interfaces (GUIs) enabled more intuitive human-computer interaction, making virtual instrumentation more accessible. Simplicity of interaction and high intuitiveness of graphical user interface operations made possible creation of user-friendlier virtual instruments. GUIs allowed creation of many sophisticated graphical widgets such as graphs, charts, tables, gauges, or meters, which can easily be created with many user interface tools in below figure. In addition, improvements in presentation capabilities of personal computers allowed for development of various sophisticated 2-D and 3-D medical imaging technologies. Compared with other computer languages, the program interface of Lab VIEW is relatively concise and intuitive, for it directly invokes graphic modules from the model base coming with the Lab VIEW software itself, rather than inputting many complex program statements. The VI Modules are developed under the Lab VIEW8.5 environment, whose front panel consists of wave viewer, check box of saving path and data collection channels, sampling frequency box, the maximum and minimum frequency box, stop switch.

SOFTWARE UNIT FOR VIRTUAL SIGNALS MEASUREMENT SYSTEM VI FOR VIBRATION

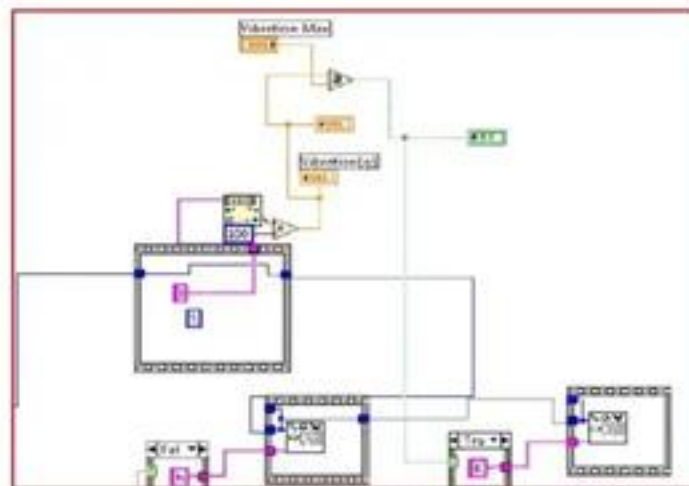


Fig. 2: Simulation for Vibration

Virtual Instrument (VI) has developed with the rapid development of computers. VI virtually implements and Expands the functions of instruments by utilizing the advanced computer technology VI can program virtual panels by its software. Through the panels, VI can acquire, analyze, process, even display the data. Based on LabVIEW, a virtual

instrument system is designed to measure and analyze vibration signals. It can rapidly reflect the vibration parameters. Also it can analyze the signals according to the actual requirements. Compared with the traditional measurement instruments, this system can generally be extended or customized. Besides above all, this system has other advantages, such as shorter development period, lower cost, more convenient maintainability.

FOR TEMPERATURE

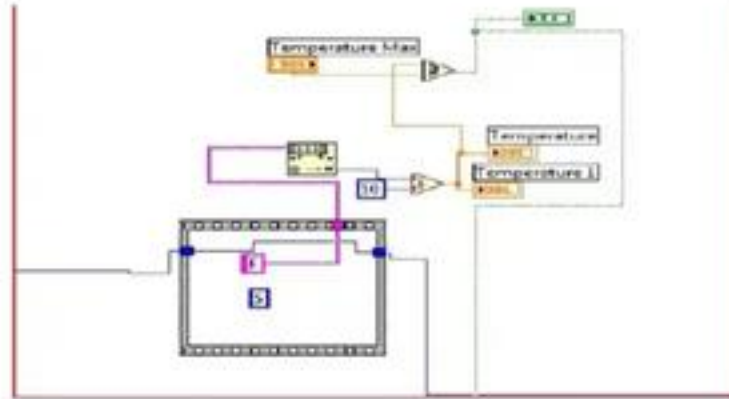


Fig. 3: Simulation For Temperature

This routine monitoring of temperature can be performed very accurately by this MEMS fabricated sensor and quality control can be carried out using LabVIEW control software. Both are new emerging technologies that gives much more accuracy and effectiveness as compared to the present day techniques of measurement and control of the process parameters. Once implemented these techniques will be really useful

With LabVIEW, control engineers can use the same platform to develop and evolve their control strategies across different approaches and technologies, such as:

- FUZZY LOGIC and ON OFF control – for relatively simple control applications
- Advanced control design – for advanced control, LabVIEW tools include plant and controller modeling tools based on traditional control algorithms or based on I/O signals using advanced system identification approaches. In addition, LabVIEW has a continuous dynamic system execution add-on for using these models with traditional control blocks such as transfer functions, integrators, differentiators, and feedback loops
- Motion control—for controlling industrial machines needing machine control
- Playback—the inherent LabVIEW I/O capabilities make it a natural tool for acquiring load data to be used for driving simulations or new prototypes of hardware

FRONT PANEL OF LABVIEW

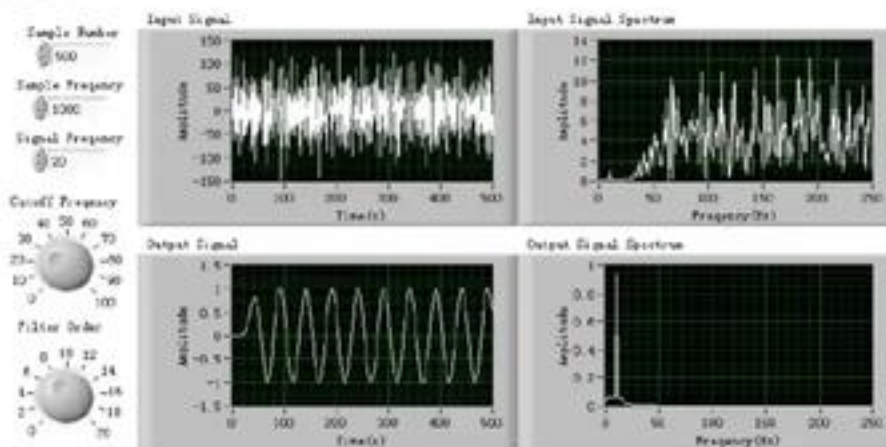


Fig. 4

NUCLEAR REACTOR MONITORING

Previously the safety purpose for nuclear reactor is based on direct measurement of parameters by sensors with indicator type of monitoring. The main parameters like temperature, vibration, pressure, acceleration etc are come under the nuclear reactor parameters. The instrumentation includes like the radial and axial position where fretting or impacting of instrumentation string tubes or other structures might occur can be localised inside the reactor pressure vessel. The

efficiency and long-term performance of subsequent improvements of the mechanical or operating conditions can be controlled with high local resolution and sensitivity. Low frequency vibrations of the instrumentation tubes were measured inside the core. Neutron-mechanical scale factors were determined from neutron noise, measured by the standard in core neutron instrumentation and from displacements of the TIP-tubes, calculated by integration of the measured in core acceleration signals. The scale factors contribute to qualitative and quantitative monitoring of BWR (Boiling water reactor) internal's vibrations by the only use of neutron signals. The vibrations of BWR internals were analysed in low frequency range (below 10 Hz) by use of the simultaneously measured signals of in-core neutron detectors and the in-core biaxial accelerometer. The later one was temporarily positioned at the neutron detector height inside of several instrumentation tubes during full power operation.

System Implementation

The total process here is based on the calibration of the model parameters, acquisition of the signals, converting them into a proper form (i.e.

Analogue to Digital conversion) and finally feeding into the LabVIEW software using DAQs. The LabVIEW graphical language is an intuitive way for engineers to develop their measurement and control applications..It is easy to learn and use, the language also delivers the performance needed for advanced applications .With LabVIEW, control engineers can use the same platform to develop and evolve their control strategies across different approaches and technologies.

Applications

- Advanced control design – for advanced control, LabVIEW tools include plant and controller modelling tools based on traditional control algorithms or based on I/O signals using advanced system identification approaches. In addition, LabVIEW has a continuous dynamic system execution add-on for using these models with traditional control blocks such as transfer functions,

Integrators, differentiators and feedback loops

- Motion control – for controlling industrial machines needing machine control
- Playback – the inherent LabVIEW I/O capabilities make it a natural tool for acquiring load data to be used for driving simulations or new prototypes of hardware

Communication System

For communications field buses were using like twisted cables, CAN bus, profibus, HART, WI-FI DAQ for the purpose of sending data from the site to the control room for monitoring purpose in nuclear industries. Computer and intelligence instrument are connected by field bus into a small distributed control system, than, develop the on-line monitoring software for reactor based on LabVIEW platform, it has data collection, display, storage and analysis functions, and it can alarm when the value of temperature or vibration exceeds the upper limit.

CLOSED LOOP ARRANGMENT

For the controlling of vibration and temperature we need to set a closed loop i.e. as a feedback from the output .So for both temperature and vibration we are using different controllers they are FUZZY LOGIC and ON-OFF controller because in case of temperature we can use fuzzy logic by fuzzifier and defuzzifier the parameter but in case of vibration the main purpose of closed loop is by shut downing.

FUZZY CONTROLLERS

Most commercial fuzzy products are rule-based systems that receive current information in the feedback loop from the device as it operates and control the operation of a mechanical or other device . A fuzzy logic system has four blocks as shown in Fig. Crisp input information from the device is converted into fuzzy values for each input fuzzy set with the fuzzification block. The universe of discourse of the input variables determines the required scaling for correct per-unit operation. The scaling is very important because the fuzzy system can be retrofitted with other devices or ranges of operation by just changing the scaling of the input and output. The decision-making-logic determines how the fuzzy logic operations are performed (Sup-Min inference), and together with the knowledge base determine the outputs of each fuzzy IF-THEN rules.

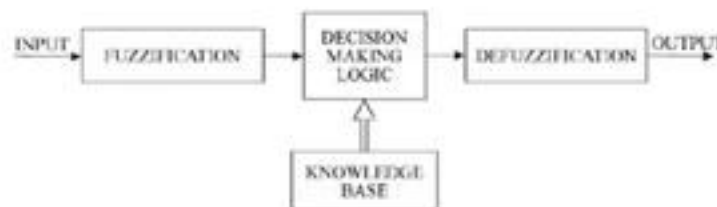


Fig. 5

Fuzzy Controller Block Diagram

In order to process the input to get the output reasoning there are six steps involved in the creation of a rule based fuzzy system:

1. Identify the inputs and their ranges and name them.
2. Identify the outputs and their ranges and name them.
3. Create the degree of fuzzy membership function for each input and output.
4. Construct the rule base that the system will operate under
5. Decide how the action will be executed by assigning strengths to the rules
6. Combine the rules and defuzzify the output

A temperature sensor provides input, with control outputs fed to an inverter, a compressor valve, and a fan motor. Compared to the previous design, the fuzzy controller heats and cools five times faster, reduces power consumption by 24%, increases temperature stability by a factor of two, and uses fewer sensors.

An on-off controller is the simplest form of temperature control device. The output from the device is either on or off, with no middle state. An on-off controller will switch the output only when the temperature crosses the setpoint.

For heating control, the output is on when the temperature is below the setpoint, and off above setpoint. Since the temperature crosses the setpoint to change the output state, the process temperature will be cycling continually, going from below setpoint to above, and back below. In cases where this cycling occurs rapidly, and to prevent damage to contactors and valves, an on-off differential, or "hysteresis," is added to the controller operations. This differential requires that the temperature exceed setpoint by a certain amount before the output will turn off or on again. On-off differential prevents the output from "chattering" or making fast, continual switches if the cycling above and below the setpoint occurs very rapidly.

CONCLUSION

In this project we can able to achieve any types of measurement of physical variables in extreme and hazardous conditions without any damage of the transducers and sensors because here we are using MEMS based sensor technology which are more reliable, long lasting and many other advancement compare to normal sensors. Due to recent trend in MEMS technology we expect that this sensor and the real time LabVIEW software will be broadly implemented to give a better result. On the other hand, the Systems used VI technology has other advantages, such as lower cost, shorter development period and its portability. It can be seen that VI technology will be used widely in seismographic observation, which is interfaced with distributed networking system RS485 for the continuous communication between the control room from all other parts of the site enables wireless, fast, accurate and full duplex communication, with sufficient signal conditioning by DAQ card interfaced with PIC microcontroller. The PIC microcontroller ports are interfaced with the data card of RS485. So therefore the project serves total safety of nuclear reactors by the use of new technologies. The safety for nuclear reactors to be make automatic by introducing of closed loop , so for close loop controller requires .Here in this project FUZZY LOGIC and ON OFF type controller is going to introduce for better safety which having many advantages and fast in nature.

FUTURE ENHANCEMENT

In future the safety system shows the combination of fuzzy logic controller with LabVIEW software for the first time, Fuzzy logic is a very powerful tool that is pervading every field and signing successful implementations which is fast in nature and easily visualised by the operator very exactly and accurately .In this safety system we can also measure other physical parameters of the reactors .It provides more security for reactors in simple and fast way.

REFERENCES

- [1] The system of vibration signals measurement based on virtual instrument technology She tianli1 and yang xueshan2 Harbin, China 2008
- [2] Development of tilt and vibration measurement and detection system using mems accelerometer as a sensor abstract .
- [3] Instrumentation and Control in Nuclear Power Plants. Analysis and Measurement 18 July 2010.
- [4] J.-D. Hong and C. Jang, "Probabilistic fracture mechanics applications for alloy 82/182 welds in PWRs," in Proceedings of the ASME Pressure Vessels and Piping Conference, 2010 (PVP2010), Bellevue, Washington, July 18-22, 2010.
- [5] New technologies for acceleration and vibration measurements Inside operating nuclear power reactors. M. Trobitz **, I. Hirsch ** and k.thoma university of hannover.
- [6] Design of reactor monitoring system based on labview and intelligence instrument Beijing Institution of Technology, Beijing, 100081, China. 16-18 Sept, 2011
- [7] . LabVIEW Wikipedia
- [8] Fuzzy logic system .Control systems principles.co.uk
- [9] Lee, C. C. (1990). Fuzzy logic in control systems: Fuzzy logic controller, IEEE Trans.systems__(2): 404-435.
- [10] Interfacing LabVIEW to Send Commands via RS485 to ADR
- [11] Design of reactor monitoring system based on LabVIEW and intelligent instrument.Guo, Shun; Zhang, Dongxiang; School of Chemical Engineering and Environment, October 2011.
- [12] Development of vibration measurement and detection system using MEMS accelerator as a sensor, 2006, University of Malaysia.

Knowledge Discovery and Data Mining

Harish Kumari

*Department of Computer Science and Engineering,
H.E.C., KUK, Jagadhri, India*

Abstract— Knowledge Discovery in Databases (KDD) is an automatic, exploratory analysis and modeling of large data repositories. KDD is the organized process of identifying valid, novel, useful, and understandable patterns from large and complex data sets. Data Mining (DM) is the core of the KDD process, involving the inferring of algorithms that explore the data, develop the model and discover previously unknown patterns. The model is used for understanding phenomena from the data, analysis and prediction. In this paper we show the how the clustering algorithm is used in Data Mining. Clustering is a data mining (machine learning) technique used to place data elements into related groups without advance knowledge of the group definitions. Popular clustering techniques include k-means clustering and expectation maximization (EM) clustering [3].

Keywords: Data Mining, Deployment, Clustering, Data set, Exploration.

INTRODUCTION

Data mining, a branch of computer science and artificial intelligence, is the process of extracting patterns from data. Data mining is seen as an increasingly important tool by modern business to transform data into business intelligence. Wide range of profiling practices, such as marketing, surveillance, fraud detection, and scientific discovery[2][3].

ADVANTAGES OF DATA MINING

Here are some of the benefits of data mining:

1. Helps to unearth facts about customers from your database, which you previously didn't know about, including purchasing behavior.
2. Lends automation benefits to existing hardware and Crediting/Banking: helpful to financial institutions in such areas as loan information and credit reporting
3. Research: makes the process of data analysis faster.
4. Law enforcement: can assist law enforcers with keying out criminal suspects and taking them into custody, by Looking into trends in various behavior patterns.
5. Marketing: helps to foretell the products which customers would like to buy.
6. Transportation: to evaluate loading patterns.
7. Medicine: to discover effective medical therapies for diverse illnesses.
8. Insurance: to make out fraudulent behavior.

THE DATA MINING PROCESS

Data mining is an iterative process that typically involves the following phases:

Problem Definition

A data mining project starts with the understanding of the business problem. Data mining experts, business experts, and domain experts work closely together to define the project objectives and the requirements from a business perspective. The project objective is then translated into a data mining problem definition. In the problem definition phase, data mining tools are not yet required.

Data Exploration

Domain experts understand the meaning of the metadata. They collect, describe, and explore the data. They also identify quality problems of the data. A frequent exchange with the data mining experts and the business experts from the problem definition phase is vital.

In the data exploration phase, traditional data analysis tools, for example, statistics, are used to explore the data.

Data Preparation

Domain experts build the data model for the modeling process. They collect, cleanse, and format the data because some of the mining functions accept data only in a certain format. They also create new derived attributes, for example, an average value.

In the data preparation phase, data is tweaked multiple times in no prescribed order. Preparing the data for the modeling tool by selecting tables, records, and attributes, are typical tasks in this phase. The meaning of the data is not changed.

Changing Paradigms for World Class ERP in Resurging India

Rashmi Jha¹ and A.K. Saini²

¹TMU, Moradabad

²Prof., University School of Management Studies, GGSIPU Delhi

Abstract—Enterprise Resource Planning is the latest high end solution that information technology has lent to business application. Initially implementation of an ERP package was possible only for very large Multi National Companies and Infrastructure Companies due to high cost involved. Today many companies in India have gone in for implementation of ERP and it is expected in the near future that 60% of the companies will be implementing one or the other ERP packages since this will become a must for gaining competitive advantage. There have been numerous stumbling blocks in ERP implementation that have not only stunted its large-scale rollout but also in a way, defeated the purpose for which it was intended especially for SMEs.

To touch down at the root Causes for failed ERP implementation, what is required first is a company-wide, in-depth understanding of the fundamentals or eight basics of Lean Six Sigma and then a total commitment to the consistent and tenacious execution of these principles. In Selecting an ERP software package and planning for the overall project, executives need to make decisions based on objective, unbiased information rather than gut feel. We also must make it sure that ERP enables measurable improvements to the business as per the standard of Global Business Operations.

Keywords: ERP, Lean, Six Sigma, DMAIC, SMEs, SaaS etc.

INTRODUCTION

Today ERP market in India is a mixed bag of great expectations, fantastic results and rich rewards and in some cases questionable excitement. Recently, due to the economic slowdown, there was little concern whether investment in the ERP by companies may decrease and the number of implementation will drastically come down. But it has been proved that these are speculations without any ground and during the last year growth of ERP implementations have gone up tremendously and companies have realized that their decision to go with ERP has brought them a good return on investment (ROI).

Though reasons to implement ERP system might vary depend on companies in India, there are some common reasons for many companies to implement an ERP system at this time. The primary reason is a slower economy that affords companies the opportunity to use their resources and implement the ERP system software successfully. The second reason is that many ERP software vendors are aggressively pricing their solutions in response to a slowing economy situation; clients are now able to procure an ERP solution at a lower cost than in years past. And the third reason is that some clients are continuing

To grow despite, or as a result of, the current economy, and these companies are investing in enterprise software that can help them scale for growth. Whatever the reason may be, what we would like to emphasize is that implementation of an ERP system will definitely will improve business performance in India. Even if the ERP implementation was successful, there are probably some opportunities to leverage the system for more business benefits and value [1][2].

Lean Six Sigma combines tools from both Lean manufacturing and Six Sigma. The fusion of Lean and 6 Sigma is required because only Lean cannot bring a process under statistical control. Similarly 6 Sigma alone cannot dramatically improve process speed or reduce invested capital. As a business improvement methodology, Lean focuses on speed & swiftness in taking crucial decision and six sigma focuses on quality of desired and defined product. With the combination of two, the result is better quality at faster rate.



Fig. 1: Lean Six Sigma as Catalyst

Analysis from Lean and 6 Sigma consultants say that 30-80% of the costs in a service business are pure waste. Eliminating this waste can not only reduce costs, but more importantly allows businesses and services to become faster and much more responsive to its customers, driving revenue growth.

BACKGROUND: LEAN SIGMA ENGAGEMENT TO ERP

Since the manufacturing industry is paying attention on improving business processes, eliminating waste and reducing costs, Management teams focus on three different tools to support their efforts: Lean, Six Sigma, and ERP. While most companies adopt only one method, we have found that companies that understand how Lean, Six Sigma, and ERP work together make improvement progress more quickly and more efficiently. In short, these three approaches can be described as:

- Lean: Aimed at eliminating waste, producing more at less cost
- Six Sigma: Aimed at improving quality by reducing variability and improving processes
- ERP: Employing new technology and best practices to enable process improvement

Lean is the set of tools that assist in the identification and steady elimination of waste (*Muda*). Examples of such tools are *Value-stream mapping*, *Five S* (1. Sort (*Seiri*), 2. Systemize/ Straighten/ Set in Order (*Seiton*), 3. Sanitize / Sweep & Shine (*Seiso*) 4. Standardize (*Seiketsu*) 5. Sustain (*Shitsuke*) all lead to 6S i.e Safety), *Kanban (Pull systems)*, *Flow (Just-in Time JIT)*, *Poka-Yoke (Error-Proofing) etc.* These tools are used in *Kaizen* (Perfection) events to organize a team's efforts to improve processes.

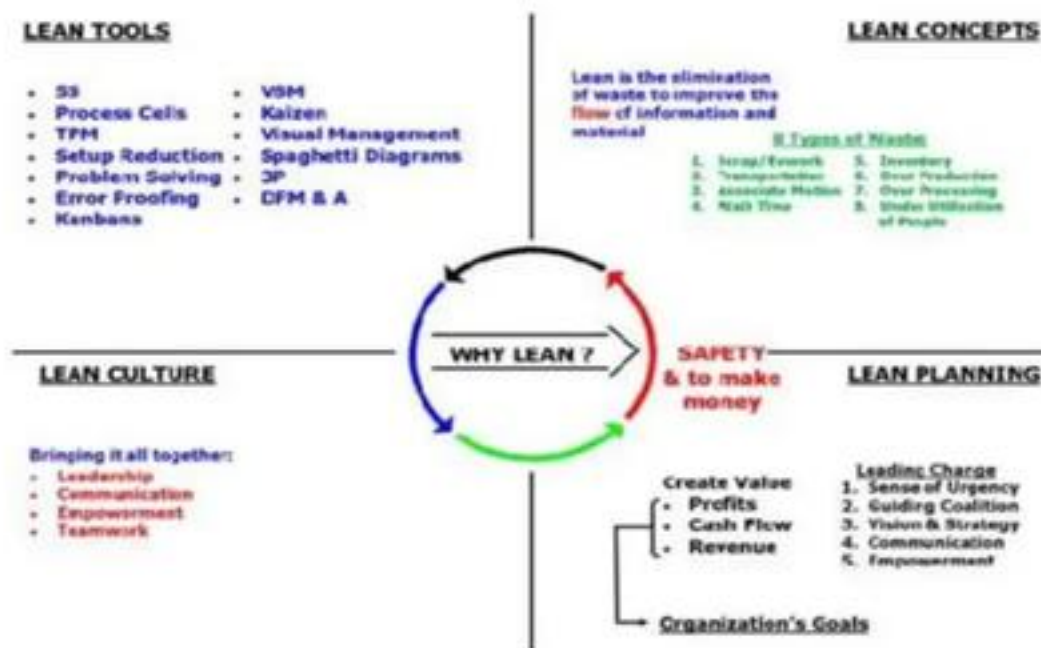


Fig. 2: Why Lean?

All center on improving processes. A process is defined by

Lean pioneer James P. Womack as "A series of actions that must be conducted properly in the proper sequence at the proper time to create value for a customer" (Womack, 2004)

The Lean Enterprise Memory Jogger lists Lean goals as 1) improving quality, 2) eliminating waste, 3) reducing lead time, and 4) reducing total cost of a process (MacInnes 2002). To increase speed, Lean focuses on removing wasteful or non-value added process steps. Lean assumes that once waste is removed the process not only gets faster, it becomes focused on what the customer values and the quality of the product is improved. The literature identifies eight forms of waste (McAdam, 2003). These Eight Wastes (*Muda*), as mentioned below in Table 1, are elicited through the determination of what the customer values.

Womack and Jones, 1996; George, 2002; Ohno, 1998; McAdam, 2003; MacInnes, 2002

Table 1: Forms of Waste (*Muda*)

Waste	Definition
Overprocessing	Adding value to a process/product the customer would not pay for
Transportation	Moving raw materials, product, or information unnecessarily
Motion	The unnecessary movement by people
Inventory	Work-in-process (WIP) that is not directly related to a customer requirement
Wait Time	The time that WIP is not directly related to a customer requirement
Defects	Flaws in the WIP, final products, or services that do not meet the customer's requirements
Overproduction	Products and services that are in excess to current customer requirements
Unused Human Resources	Having excess workforce for the process

To uncover the waste and find the value, a lean initiative uses **Value Stream Mapping**. Companies create value stream maps to identify waste in manufacturing processes and to find ways to eliminate that waste. Although value stream mapping is often associated with manufacturing, it is also used in logistics, supply chain, service industries, healthcare, software development, and product development. A key metric associated with value stream mapping is Lead Time.

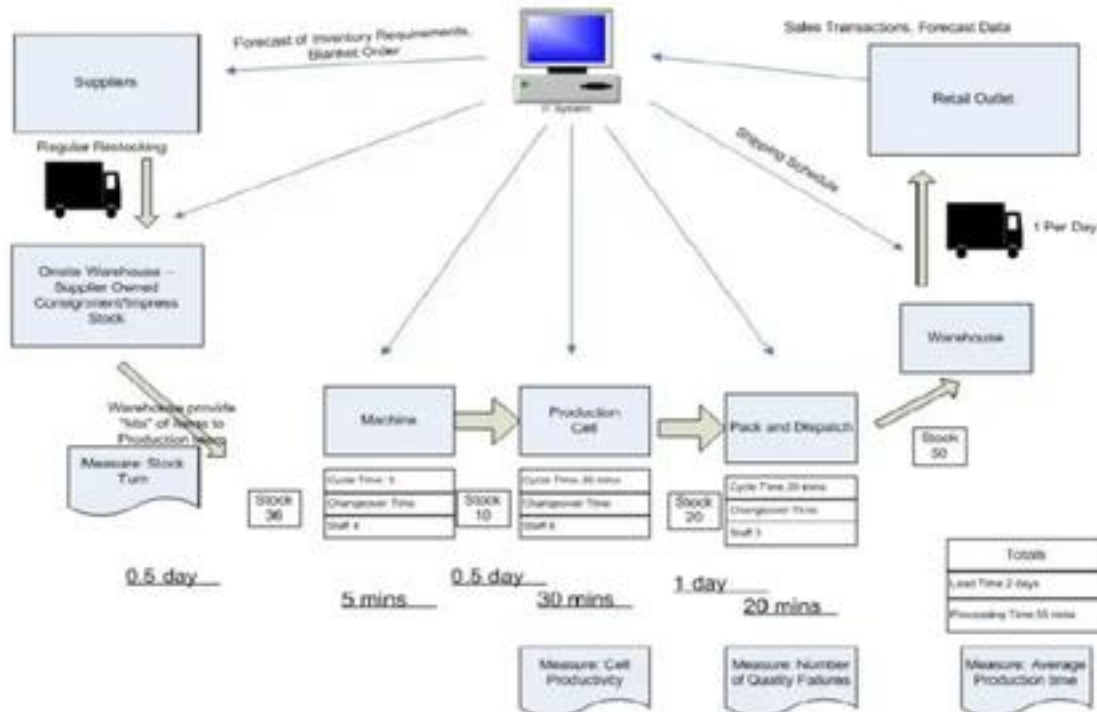


Fig. 2: Value Stream Mapping

Sigma Level	Defects Per Million Opportunities	Cost of Quality
2	308,357 (Noncompetitive companies)	Not applicable
3	66,807	25-40% of sales
4	6,210 (Industry average)	15-25% of sales
5	233	5-15% of sales
6	33.4 (World class)	<1% of sales

Each Sigma shift provides a 10 percent net income improvement

Six Sigma is a continuous improvement methodology that focuses on the reduction of variation. Sigma represents the standard deviation, a unit of measurement that designates the distribution or spread about the mean of a process (Six Sigma Academy, 2002). Six Sigma as a business initiative was first espoused by the Motorola Corporation in the early 1990s. These efforts cumulated in the analysis tools contained in Statistical Process Control (SPC) and were combined with analysis methods defined and refined by Six Sigma pioneers Dr. Mikel Harry and the Motorola company's Bill Smith (Upton and Cox, 2002; Harry and Schroeder, 2000). Six Sigma is defined as a statistic, a philosophy, and a methodology. As a statistic in the quality paradigm, it is 3.4 defects per 1 million opportunities and is related to the cost of quality (Harry and Schroeder, 2000). Table 2 provides a reference to how sigma levels can affect percent net income.

Table 2: The Cost of Quality

The Six Sigma methodology is a five-phase, disciplined approach to continuous improvement. The five-phases are **Define, Measure, Analyze, Improve, and Control as DMAIC**. DMAIC methodology is the way through which the Six Sigma project progress.

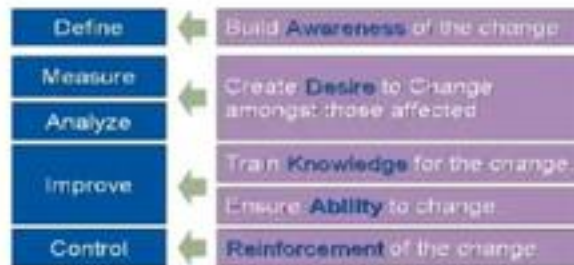


Fig. 4: DMAIC Project Methodology

These business needs are driven by fundamental voices that make a business operate, Voice of Customer, Voice of Business and Voice of Employee. Therefore Six Sigma's goal is to improve all processes to that level of quality or better. It uses a set of quality-management methods, including statistical methods that creates a special infrastructure of people within the organization ("Black Belts," "Green Belts," etc.) who become experts in these methods.

Lastly, the term **Enterprise Resource Planning (ERP)** was originally derived from the term Manufacturing Resource Planning (MRP), which was used to describe a collection of software applications. ERP systems are designed to address this problem of fragmentation as they integrate and streamline internal processes (Koch, 2003) by providing a suite of software modules that cover all functional areas of a business.



Fig. 5: ERP Software Systems

Surprisingly, all the Three Tools (Lean, Six Sigma & ERP) conflict in the market. Lean and Six Sigma advocates often argue that short-term process improvements are a better investment than new technology (ERP). On the other hand, ERP software vendors market their products as "Lean" compliant. The similarities in these three approaches are significant! All three have the same objective – to improve the business! All analyze current processes, and design new processes. All three demand the company's "best and brightest" with a commitment of executive support and sponsorship.

CHALLENGES FOR ERP IMPLEMENTATION IN INDIA: KEY SOLUTION AHEAD

The key benefits that accrue from ERP is in area of speed of response of business processes, user friendly interfaces, ready-made functionality, reduced working capital, improved customer satisfaction, improved quality of decision making, increased productivity across the board, cycle time reduction in all phases and above all defining metrics, measuring and bench marking. All these will contribute to the customer getting quality products at affordable prices in "Good Time - Every Time". But ERP Solution is not as easy as ABC. ERP Solutions are no Magic Pills. There have been some weak spots in ERP implementation that have not only stunted its large-scale rollout but also in a way defeated the purpose for which it was intended. The prime factors that have contributed to slow penetration of ERP in India (with their solutions) are:

Cost of ERP

Though ERP is out of reach for most of the Indian company, the cost of ERP software should not be viewed as an expense alone. Rather, it is an investment towards better profitability, market share or customer services. ERP decisions are a 'High-Risk High-Reward' decision. The view that ERP is expensive only takes into account the risks but not the rewards .

Level of Computerization

Though computerization is gradually happening at central levels, in most states of India, archaic system of physical documentation, obsolete age-old techniques at manufacturing level still dominate. Till now, only about 6% of government bodies are computerized. Till the time governments move towards technology-oriented methods, we can't make a shift towards ERP related issues. This is, in fact, a big gap that needs to be addressed without any delay.

Since India is passing through a phase of high growth in IT, without true empowerment of an average Indian, this growth curve will create a skew leading to imbalances and economical, social instability. We must understand that in technology, lays the key for true empowerment.

Lack of Internet Infrastructure

It is true that Internet access is still very expensive and the access device is primarily a PC, which most Indians cannot afford. The PC penetration of about 1.5 per thousand and phone penetration is in the range of 10 per thousand do not augur well for e-commerce and ERP to take off. But we should also note that India has some unusual ways of doing business too.

The ISP Policy of November 1998 is truly a historic policy. What took VSNL three years (Aug 95 to Nov 98) to grow user population to 100,000 Satyam & Mantra each could do the same number in roughly in one year. The other silver lining is the phenomenal growth of Cable TV during 1994-99 to a staggering 40 million - which is three times that of phone lines (DoT took 100 years to grow this many users). With other non-PC devices including cable modem, cell phones, Palm Tops becoming browsing devices and the World Tel in Tamil Nadu (led by Sam Pitroda) and Reliance in Karnataka starting tens of thousands of Internet Kiosks all over the country, the perceived poor Internet Infrastructure may not be able to stop the e-commerce. With mobile computing around the corner and the unusual ways of using mobile devices in India, tremendous investments in backbone fiber optic network (plans to add 1 Million miles of fiber by Public Sector (Railways, DoT, Power Grid) and Private Sector (Enron, Reliance, BPL) and the possible commissioning by year 2001 of under-sea cable link between Chennai and Singapore, the bandwidth problem is likely to ease too. For a change, Government has also removed VSNL monopoly in Internet Gateway. This too should help the growth of Internet infrastructure along with modern business scenario in India.

Security Problems Associated with Net Transactions

It is indeed a serious problem & cannot be taken lightly, but one should not forget that security is more a "mindset" problem than a real problem. The younger generation once again, does not seem to have such serious problems with credit cards, ATM cards or buying on the Net. Otherwise one cannot explain the brisk sales over Rediff site or Fabmart site within a year of their operation. It may be recalled that even in the United States where an average American citizen owns more than three credit cards, one third of the transactions (by numbers & not by value) even as late as 1998 was in cash - once again emphasizing the "mindset problem" rather than risks associated with new forms of money.

As long as people find "value" (it may be convenience, speed or lower transaction cost) they will switch to Net based transactions - particularly those who do not have "mindset" problem. With significant population of Indians being young, one can re-assure that e-commerce with ERP will take off in spite of security problems.

Legal Incompetence

In a domain where six months is equivalent to a year, our base line for legal issue is still the IT Act, 2000. Globally technology governance initiatives are always preceded with radical legal reforms in order to provide a conducive environment for better e-commerce.

The specific ERP software that has been adopted to suit to Indian statutory laws is called India-specific ERP. It also necessitates development of comprehensive regulatory and legal frameworks within which Indian Computerized Business Technology can perform e.g. E-commerce, Anti-Cyber-Crime Enforcement, Digital Contracts, Online Intellectual Property and Copyright Protection, approaches to Internet Taxation and Fees, adoption of International Online Standards etc.

Local Language Enabling

India is a vast country with 16 official languages. This diversity becomes extremely complex if one needs to build an infrastructure based on common standards. The huge task involves the participation of both the private as well as the public sector.

Thus ERP software must address all the enterprise needs of an organization within the social context in which the enterprise operates. This would imply that the local account practices, locally applicable taxation laws (excise, customs, sales tax and income tax) are fully adhered to in implementing the various business processes. The software vendor must incorporate India specific features before selling the software. Business environment has today been extremely competitive in most part of the world.

What Does the CEO Do to Get Started?

Typically, early projects focus on improving those aspects of the business that affect cost, quality, cycle time or customer satisfaction. Figure 6 illustrates a process flow for deploying a Six Sigma quality improvement initiative. When choices have to be made, it is always appropriate to start with areas that are causing customer dissatisfaction, since the customer is the source of revenue. However indisputable the benefits of lean manufacturing and six sigma, in today's fast-moving, complex business environment, we must continually adapt. We must do so by handling large amounts of data and executing complex workflows while electronically communicating any exceptions simultaneously to multiple locations.

In an environment like this, we need enabling software applications and a stable technology platform.

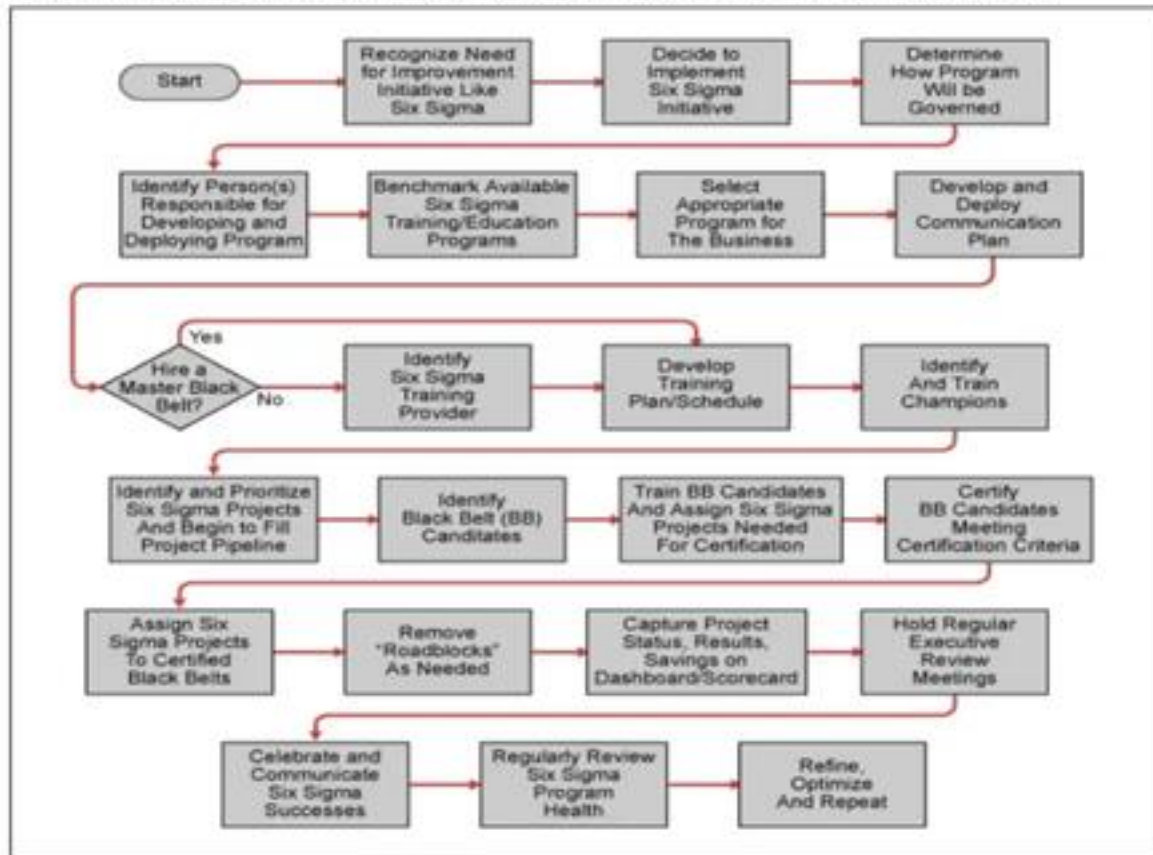


Fig. 6: Process Flow Diagram for Quality Improvement Program

To create an adaptive manufacturing environment, we must be able to access real-time information from the plant floor and the supply chain and then use this information to manage exceptions with enterprise resource planning (ERP) and supply chain management (SCM) applications.

MANAGING THE TRANSITION FROM THE OLD TO NEW

To best manage the transition from the old system to new, Right ERP Selection, Right Cutover, Right Customization is needed. ERP selection is not just about wants and want-nots from the various people in the organization. It should be a long lasting purchase that provides one with the feeling of a partnership. One is not just buying software; one is also buying into a vendor and their company culture. The analysis has addressed some critical selection factors from the survey results conducted on SME project leaders for ERP implementation. These critical selection factors are System Functionality Requirements, Business Drivers, Cost Drivers, Flexibility, Scalability, Usability, Reliability, Agility, Supportability and Integrity. Systems must improve their capabilities in a smooth evolution rather than through a constant barrage of herky-jerky upgrades and bug fixes.

For Right Cutover option, SMEs chooses between two cutover options: hard (with no employee access to the old system after go-live) and soft (with some or total employee access to the old system). In 2010, Generally two-thirds of respondent companies (66%) chose a hard cutover and one-third (34%) chose a soft (or parallel) cutover. Panorama consultants recommend parallel runs of both systems over the conversion system to ensure nothing unexpected occurs.

Next, Deciding on the right level of customization for a company's business processes is critical to the success of an ERP project. While customization is able to improve the value of out-of-the-box software and allow the company to maximize its cutting-edge advantages, it also can result in high implementation costs without the realization of expected benefits. The question of how a company should balance schedule and budget goals against the benefits of customizing its ERP system has always been a source of great debate during selection and implementation.

Evaluating ERP Implementation & Performance Measurements for Indian Companies

The Indian company should have a scale for evaluation right from the beginning stage. These company must periodically make a note of the work done. Any discrepancies will be brought to the vendor's notice immediately. The vendor should extend his full fledged cooperation in making sure that the work gets done as promised. Then only it is possible to scale ERP best practices.

Calculating ROI

ROI helps to directly account the performance of ERP software programs. The ROI on ERP will not be merely achieved by ERP implementation. The returns will be achieved only if the procedures are followed properly.

Unfailingly Observing Contracts Terms

The performance of ERP software can be gauged on the basis of its working in relation to the terms of contract. ERP software that accords to contractual terms in relation to working definitely indicates better performance than vice versa.

CUSTOMIZING ERP SOFTWARE

Customizing is an integral part of ERP solutions. This is a crucial decision which needs to be taken by the organization as it is detrimental in ERP'S success. The rate of customization is directly proportional to ERP success. Customization tends to pose a challenge to time and the funds allocated. The challenge of a successful management lies in balancing them and making both ends meet. It is a difficult task but the success speaks for the process.

Enhancements through ERP Innovations

The innovations of new ERP applications help users to include all the specific details in ERP system itself. This means they don't have to input these details into the ERP systems every time they login. This also implies that the operators need not recompile ERP software as and when there is a change in the attributes or methodology of data fed. Customization has also helped the users to act independently rather than depending on the vendors whenever a modification is required.

Sound knowledge about ERP System

The features are it old or new or modern or traditional will not be of any use unless the users are aware of the ERP Systems features and modalities. This knowledge has to be imparted to the end users apart from IT personnel. They should have a clear knowledge about the entire system in finger tips. If questioned or demanded they must be capable of bringing that particular function into effect. The services of an expert ERP consultant will come in handy for an organization to supply this information to the user.

Discussions & Conclusion

ERP is the finest expression of the inseparability of business and information technology. The essence of ERP is the fundamental premise that the whole being greater than some of its parts. Companies deploying

Modern lean manufacturing and six sigma approach is imperative to respond to the real-world challenges and demands as Core to success is the degree of integration into ERP to elevate the lean manufacturing and six sigma initiatives from localized efforts to a more scalable and all-encompassing process that drives significant benefits across supply networks. This combination needs to be supported by a scalable

Technology platform that includes data acquisition, data warehousing, OLAP, planning framework, BI tools, dashboards and analytical applications with preconfigured content

In short, as the company moves to six sigma quality levels, their cost of quality decreases to one to two percent of revenue. These dramatic cost savings come as their quality costs move from "Failure Costs" (such as resolving customer complaints) to "Prevention Costs" (such as through Six Sigma projects and other customer focused activities). Therefore while making a critical decision that will affect every aspect of Indian business, it is important to be informed of all of the relevant factors and to have realistic expectations of company's needs and its capabilities. Despite an ERP vendor's smooth talk or brilliant promises from Lean Six Sigma experts, it is important to realize the greatest achievement of the business spirit is to live up to one's opportunities and make the most of one's resources.

FUTURE STUDY

The quest for the future ERP-systems ends where it began. An overall main challenge with today's ERP-system is that there is a 'misfit' gap between the required and delivered functionalities. Training people to accept change and getting them to do business in a totally new way by using modern IT equipment and Software Engineering concepts is taxing and demanding. Open-Source ERP-systems seem to have earned an increasing interest but the obvious benefits still seem missed out. Besides the impact of SaaS (Software as a Service) could take this discussion of the value creating and competitive advantage of ERP-systems to the further end, Then here also some limitations slow down the acceptance of SaaS and prohibit it from being used in some cases:

- Since data is being stored on the vendor's servers, data security becomes an issue.
- SaaS applications are hosted in the cloud, far away from the application users. This introduces latency into the environment; so, for example, the SaaS model is not suitable for applications that demand sub-second response times.
- Multi-tenant architectures, which drive cost efficiency for SaaS solution providers, does not allow true customization of applications for large clients, prohibiting such applications from being used in scenarios (applicable mostly to large enterprises) for which such customization is necessary.
- Some business applications require access to or integration with customer's current data. When such data is large in volume or sensitive (e.g., end users' personal information), integrating it with remotely hosted software is costly and/or risky.

REFERENCES

- [1] Chen, C.C, Law C and Yang, S.C, "Managing ERP Implementation Failure: A Project Management Perspective", IEEE Transactions on Engineering Management 2008, ISSN: 0018-9391, Vol. 56, Issue: 1, pp. 157-170.
- [2] Chonyacha Suebsin and Nathasit Gedsri, "Key factors driving the success of technology adoption: Case examples of ERP adoption", IEEE International Conference on Management of Engineering & Technology, PICMET 2009, ISBN: 978-1-890843-20-5, pp. 2638-2643.
- [3] Daneva, M, "Using Maturity Assessments To Understand The ERP Requirements Engineering Process", Proceedings of IEEE Joint International Conference on Requirements Engineering 2002, ISSN: 1090-705X, ISBN: 0-7695-1465-0, pp. 255-262.
- [4] Deshmukh, S.V. Lakhe, R.R., "Six Sigma - An Innovative Approach for Waste Reduction: A Case Study Of An Indian SME ", IEEE International Conference Industrial Engineering and Engineering Management, IEEM 2008, ISBN: 978-1-4244-2629-4, pp.1553-1556. . Eric Kimberling, "The Role of Lean Six Sigma in ERP", 2008, <http://it.toolbox.com/blogs/erp-roi/the-role-of-erp-in-lean-six-sigma-27962>.
- [5] Eric Kimberling, "The 2010 ERP Vendor Analysis Results Are In, and the Winner Is...", 2010, <http://panorama-consulting.com/the-2010-erp-vendor-analysis-results-are-in-and-the-winner-is/>.
- [6] Eric Kimberling "From Magic Quadrant to Top 10 ERP Vendors", 2010, <http://it.toolbox.com/blogs/erp-roi/from-magic-quadrant-to-top-10-erp-vendors-40117>.
- [7] Eric Kimberling, "2010-ERP-Report Final", <http://panorama-consulting.com/resource-center/2010-erp-report/24>.
- [8] Eric Kimberling, "ERP Software Best Practices and Lessons Learned from Study of 670 SMBs", <http://it.toolbox.com/blogs/erp-roi/erp-software-at-smb-best-practices-and-lessons-learned-from-study-of-670-smb-31167>
- [9] Fan, J.C. and Kwoting Fang, "ERP Implementation and Information Systems Success: A Test of DeLone and McLean's Model", IEEE International Technology Management for the Global Future, PICMET 2006, ISBN: 1-890843-14-8, pp. 1272-1278.
- [10] Guido Capaldo and Pierluigi Ripa, "A Methodological Proposal to Assess the Feasibility of ERP Systems Implementation Strategies", Proceedings of the 41st Annual Hawaii IEEE International Conference on System Sciences (HICSS 2008), pp.401.
- [11] Gul Tekin Temur and Sitki Gozlu "Determination of Performance Criteria for ERP Software Technology", IEEE International Conference Management of Engineering & Technology, ISBN: 978-1-890843-17-5, pp. 2057 - 2065.
- [12] Ian Sommerville, "Construction by Configuration: Challenges for Software Engineering Research and Practice," 19th Australian Conference on Software Engineering (ASWEC 2008), ISBN: 978-0-7695-3100-7, pp. 3-12.
- [13] Jarrar, Y.F. Al- Mudimigh, A. Zairi, "ERP Implementation Critical Success Factors-The Role And Impact of Business Process Management ", Proceedings of the IEEE Management of Innovation and Technology, 2000, ISBN: 0-7803-6652-2, vol.1, pp.122 - 127.
- [14] Kerimoglu O. and Basoglu, A. N., "Optimizing the Change Management of Enterprise Resource Planning Systems Implementations", Proceedings of the IEEE Portland International Conference on Management of Engineering and Technology PICMET 06.
- [15] Kim Man and Lui Chan, "Rescuing Troubled Software Projects by Team Transformation: A Case Study With an ERP Project", IEEE Transactions on Engineering Management, 2008, ISSN: 0018-9391 Vol 55 Issue 1, pp. 171 - 184.
- [16] Kun Shi, Qiang Lu, "Exploration and Verification of Factors in the Front-end Stage of the ERP Implementation Process: Evidence from Case Study and Survey Research", 2009 IEEE, ISBN: 978-1-4244-4870-8.
- [17] M. S. Camara, L. Kermad, A. El Mhamedi, "Risk Prediction in ERP Projects: Classification of Reengineered Business Processes," International Conference on Computational Intelligence for Modelling Control and Automation (CIMCA 2006), ISBN: 0-7695-2731-0, pp.213.
- [18] Maya Daneva, "ERP Requirements Engineering Practice: Lessons Learned," IEEE Software, Vol. 21, Issue 2, Mar./Apr. 2004, pp. 26-33.
- [19] Rafa Kouki, Robert Pellerin and Diane Poulin, "An Exploratory Study of ERP Assimilation in Developing Countries: The Case of Three Tunisian Companies," The Third International Conference on Software Engineering Advances, ICSEA 2008, ISBN: 978-0-7695-3372-8, pp.523-529.
- [20] Van Stijn, E. and Wensley, A. (2001) 'Organizational memory and the completeness of process modeling in ERP systems: some concerns, methods and directions for future research', Business Process Management Journal, Vol. 7, No. 3, pp.181-194.
- [21] Vuksic V. B., Spremic M., "Case Study of PLIVA Pharmaceuticals Inc. - Aligning ERP System Implementation with Business Process Change", 26th IEEE International Conference on Information Technology Interfaces, ISBN: 953-96769-9-1, Vol. 1, pp. 65-70.
- [22] William H. Gaw, "Eight Basics of Lean Six Sigma for Manufacturing Firms", <http://www.isixsigma.com/index.php?option=com_k2&view=item&id=530:&Itemid=182Eight Basics of Lean Six Sigma for Manufacturing Firms.>
- [23] <<http://www.syscon-solutions.com/docs/erp.pdf>>
- [24] <http://www.gal.ganogroup.it/espressroom_view.asp?id=11>
- [25] <http://www.google.co.in/images?hl=en&source=imghp&q=fishbone+analysis+diagram&btnG=Search+Images&gbv=2&aq=f&aqi=&aql=&eq=&gs_rfai=>
- [26] <http://www.articlesbase.com/management-articles/the-dmadv-methodology-50429.html>
- [27] http://www.isixsigma.com/index.php?option=com_k2&view=item&id=723:selecting-the-best-business-process-improvement-efforts&Itemid=190&tmpl=component&print=1
- [28] <<http://panoramaconsulting.com/services/complementary-erp-consulting-services/six-sigma-and-value-stream-analysis>>
- [29] <<http://cba.uah.edu/guptaj/m680/erpimpfinney.pdf>>
- [30] <http://www.erppandit.com/right-time-to-implement-ERP-software.html>>
- [31] <<http://www.lss-academy.com/printing/?id=8>>
- [32] <<http://www.google.co.in/imgres?q=lean+tools&hl=en&sa=X&biw=1440&bih=686&tbn=isch&prmd=imvnsb&tbnid=KIPIBh0BxE0XGM:&imgrefurl=http://www.reliableplant.com/Read/26210/tpm-lean-i>>
<http://www.google.co.in/search?q=value+stream+mapping&hl=en&sa=X&prmd=imvnsb&tbn=isch&tbo=u&source=Six+Sigma+implement&docid=meP_>
- [33] <<http://shakehandwithlife.blogspot.in/2011/04/six-sigma-gauge-of-measuring-goodness.html>>

An Analytical Study on Load Balancing and Task Allocation to Processors in a Distributed Computing Environment

Pankaj Saxena¹ and Rajendra Belwal²

¹Teerthanker Mahaveer University, Moradabad (U.P)

²Kumaun University, Nainital (U.K)

Abstract—The distributed task allocation problem occurs in domains like web services, the grid and other distributed systems. In distributed computing systems (DCS), task allocation strategy is an essential phase. The advancement in new technologies in communication and information lead to the development of distributed systems and parallel systems. To utilize the capabilities of DCS for an effective parallelism, the task must be properly allocated to the available processor in the system. Recent years have seen a significant amount of work on task and resource allocation methods, which can potentially be applied to many real word applications. In DCS an allocation policy can be either static or dynamic, depending upon the time at which the allocation decisions are made. A large number of techniques on task allocation in DCS have been reported and they can be broadly classified into three categories which are graph theoretic techniques, integer programming techniques and heuristic techniques. This paper presents a brief outline of the varies available models and algorithms for task allocation with suggestions for possible future directions in the field.

Keywords: Distributed Computing System (DCS), Task Allocation, Static, Dynamic.

INTRODUCTION

Many applications normally take a long time to finish execution on one machine. If these applications can be divided into a number of tasks and executed concurrently on different machines, a tremendous improvement in the performance will occur. But there are two main problems, first one includes partitioning the application into tasks and the second one is assigning the tasks to the processor. In Distributed computers system the computers may be homogenous or heterogeneous, connected together for some common application execution. A task is a set of modules and module executes on one of the processing nodes and communicates with some other modules of the task by inter module communication. A task is a program or a part of a program in execution. It is one of the important computational activities that take place at the same time and /or at different locations In contrast to a task, a job is a whole, usually sequential, program in execution. In DCS the software Application is called a task and is a set of cooperating modules. Tasks of a given application require certain computer resources like memory, processor and some communication link.

DETAILED ANALYSIS REGARDING TASK ALLOCATION

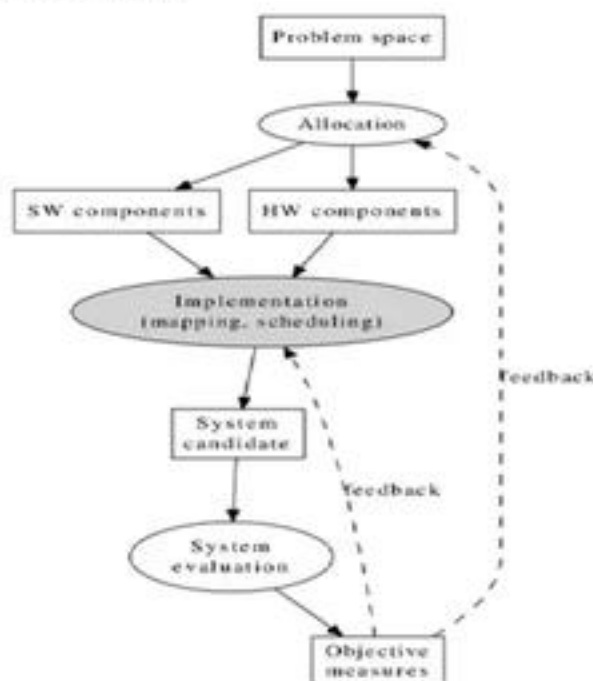


Fig. 1

Task Allocation Scenario

In this research paper we examine static task allocation in heterogeneous computing system which provides a variety of architectural capabilities, orchestrated to perform on application problems whose tasks have diverse execution requirements. Static task allocation technique can be applied to a large set of real world applications that are able to be formulated in a manner which allows for deterministic execution. Some advantages of these techniques over dynamic ones, which determine the modules assignment during run time, are that static techniques have no run time overhead and they can be designed using very complex algorithmic mechanism which fully utilizes the properties of a given application. We study the performance of the algorithms over a wide range of parameter such as number of modules, the number of processors, the ratio of average execution cost to average communication cost and the connectivity of modules. Task allocation is a very interesting problem in DCS. This problem deals with finding an optimal allocation of tasks to the processors so that the system cost can be minimized without violating any system constraint. Distributed computing systems such as a network of heterogeneous workstations or PCS become an attractive alternative to expensive, massively parallel machines. But to exploit effective parallelism or distributed system, the tasks (more processors have more tasks) must be properly allocated to the processors. Multiple tasks if not managed properly would lead to the degradation of overall system. The issue is how to assign, allocate or schedule the task of a given application onto the available computers of the system so as to maximize the system throughput i.e. to minimize the total sum of execution and communication costs. A distributed computing system consists of a set of multiple processors which are geographically distributed, interconnected by some communication link.

RELATED WORK COMPARED WITH EACH OTHER

In the networking fields different routing algorithms make use of voronoi diagrams and delaunay triangulations. meguerdichian, et.al propose a new routing graph for mobile ad hoc networks. shehory, and kraus and learnan and shehory [2000] propose distributed algorithms of low complexity which is useful when a group of agents can be more efficient when working together or when no single agent by itself can satisfy a task. shehory[2000] addresses the problem of locating agents without traditional approaches.

While most of these algorithms are reported to be efficient, it is not clear how they compare against each other. A meaningful performance evaluation and comparison of these algorithms is a complex task and it must take into account a number of issues. First, most scheduling algorithms are based upon diverse assumptions, making the performance comparison rather meaningless. Second, there does not exist a standard set of benchmarks to examine these algorithms. Third, most algorithms are evaluated using small problem sizes, and, therefore, their scalability is unknown. For future there must be taxonomy for classifying various algorithms into distinct categories according to their assumptions and functionalities. Also there should be a set of benchmarks that are based on diverse structures and are not biased toward a particular scheduling technique. Then there must be a comparison on a common platform by using the proposed benchmarks, as well as by varying important problem parameters. The result should be interpret and based upon the design philosophies and principles behind the algorithms, there must be a performance measure that captures the collective effectiveness of a scheduling algorithm in terms of its solution quality, the number of processors used, and the running time.

Parameters	Round Robin	Random	Local Queue	Central Queue	Central Manager	Threshold
Overload Rejection	No	No	Yes	Yes	No	No
Fault Tolerant	No	No	Yes	Yes	Yes	No
Forecasting Accuracy	More	More	Less	Less	More	More
Stability	Large	Large	Small	Small	Large	Large
Centralized/Decentralized	D	D	D	C	C	D
Dynamic/Static	Sta	S	D	D	S	S
Cooperative	No	No	Yes	Yes	Yes	Yes
Process Migration	No	No	Yes	No	No	No
Resource Utilization	Less	Less	More	Less	Less	Less

Comparison of Load Balancing Algorithms

FUTURE WORK

There are several interesting areas for future work:

- Analyzing the values to see whether some tasks wait much longer than others.
- Different experiments can be done with the agents with different velocities.
- Developing a look ahead algorithm for determining which task to pursue based on adjacency information.
- One can consider adopting some strategies aimed at increasing the common utility, and analyze that how well cooperative agents will perform in the presence of agents.
- Different attempts are made for maximizing the number of tasks fulfilled by agents. One can also do the future experiments by considering other cost based metrics, such as maximizing agent idle time.

The performance of the different approaches such as task based and work flow based approaches is similar for compute intensive cases, but the work-flow based approaches perform better for data intensive cases, where they take advantage of the ability to begin transferring large data sets earlier and make decisions based on global measures of performance time taken by the work-flow based algorithms grows more rapidly than for the task based approaches.

Data mining experts select and apply various mining functions because you can use different mining functions for the same type of data mining problem. Some of the mining functions require specific data types. The data mining experts must assess each model.

In the modeling phase, a frequent exchange with the domain experts from the data preparation phase is required.

The modeling phase and the evaluation phase are coupled. They can be repeated several times to change parameters until optimal values are achieved. When the final modeling phase is completed, a model of high quality has been built.

- Does the model achieve the business objective?
- Have all business issues been considered?

Deployment

Data mining experts use the mining results by exporting the results into database tables or into other applications, for example, spreadsheets. The Intelligent Miner™ products assist you to follow this process. You can apply the functions of the Intelligent Miner products independently, iteratively, or in combination.

The following figure shows the phases of the Cross Industry Standard Process for data mining (CRISP DM) process model.

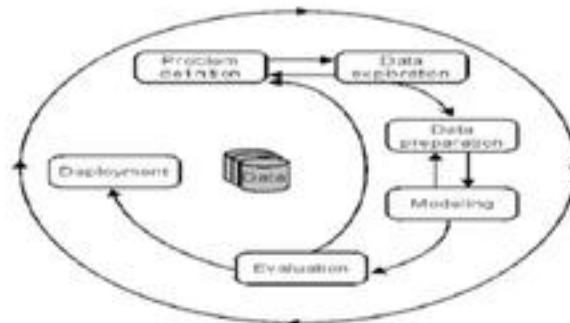


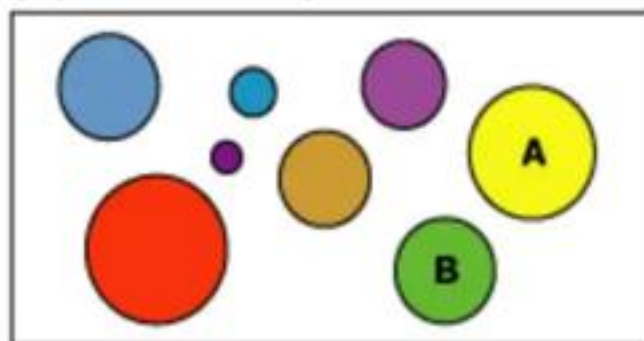
Fig. 1: Data Mining Process

Helps you to select the input data, explore the data, transform the data, and mine the data. With IM Visualization you can display the data mining results to analyze and interpret them. With IM Scoring, you can apply the model that you have created with IM Modeling.

CLUSTERING ALGORITHM

The Microsoft Clustering algorithm is a segmentation algorithm provided by Microsoft SQL Server 2005 Analysis Services (SSAS). The algorithm uses iterative techniques to group cases in a dataset into clusters that contain similar characteristics. These groupings are useful for exploring data, identifying anomalies in the data, and creating predictions [1].

Clustering models identify relationships in a dataset that you might not logically derive through casual observation. For example, you can logically discern that people who commute to their jobs by bicycle do not typically live a long distance from where they work. The algorithm, however, can find other characteristics about bicycle commuters that are not as obvious. In the following diagram, cluster A represents data about people who tend to drive to work, while cluster B represents data about people who tend to ride bicycles to work.



A = Commuters who drive to work
B = Commuters who bicycle to work

Fig. 2: Clustering Models Identify Relationships in a Dataset

CONCLUSION

As the conclusion there are so many researches and good algorithms are easily available in the literature and it is really motivating especially for a new researcher that newer techniques are coming day by day in a effective manner, but still there is a large scope of improvements exists as minimizing the cost, efforts, time, workload and maximizing the reliability and throughput both. in this way the conclusion of this paper is that there must be more updation in the techniques in terms of practical utilization to make the distributed environment more powerful.

REFERENCES

- [1] Tefvic Kosar, Miron Livny, "A framework for reliable and efficient data placement in distributed computing system", *Journal of Parallel and Distributed Computing*, Vol:65, Issue:10, PP:1146-1157, 2005.
- [2] Dr. Kapil Govil, "A Smart Algorithm for Dynamic Task Allocation for Distributed Processing Environment", *International Journal of Computer Applications*, Vol: 28, Issue 13, PP.13-19, 2011.
- [3] MinYeol Lim, Vincent W. Freeh, David K. Lowenthal, "Adaptive, transparent CPU scaling algorithms leveraging inter-node MPI communication regions", *Journal of Computing*, Vol:37, Issues 10-11, PP. 667-683, 2011.
- [4] Ioannis Riakiotakis, Florina M. Ciorba, "Distributed dynamic load balancing for pipelined computations on heterogeneous systems", *Journal of Parallel Computing*, Vol: 37, Issues 10-11, PP. 713-729, 2011.
- [5] Rajkumar Buyy, Chee Shin Ye, Srikumar Venugopal, James Broberg, Ivona Brandic, "Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility", *Journal of Future Generation Computer Systems*, Vol: 25, Issue 6, PP. 599-616, 2009.
- [6] Edward A. Billard, Joseph C. Pasquale, "Load balancing to adjust for proximity in some network topologies", *Journal of Parallel Computing*, Vol: 22, Issue 14, PP. 2007-2023, 1997.
- [7] Henri Casanova, Frederic Desprez, Frederic Suter, "On cluster resource allocation for multiple parallel task graphs", *Journal of Parallel and Distributed Computing*, Vol: 70, Issue 12, PP. 1193-1203, 2010.
- [8] P Visalakshi, S N Sivanandam, "Dynamic Task Scheduling with Load Balancing using Hybrid Particle Swarm Optimization", *Journal of Open Problems Compt. Math*, Vol: 2, Issue 3, 2009.
- [9] Tzu-Chiang Chiang, Po-Yin Chang, and Yueh-Min Huang, "Multi-Processor Tasks with Resource and Timing Constraints Using Particle Swarm Optimization", *IJCSNS International Journal of Computer Science and Network Security*, Vol: 6, Issue 4, PP.71-77, 2006.
- [10] Annie S. Wu, Han Yu, "Shiyuan Jin, Kuo-Chi Lin and Guy Schiavone, "An Incremental Genetic Algorithm Approach to Multiprocessor Scheduling", *Journal of IEEE Transactions on Parallel and Distributed Systems*, Vol: 15, Issue 9, PP. 824 - 834, 2004.
- [11] Abderezak Touzene, Sultan Al-Yahai, Hussien AlMuqbal, Abdelmajid Bouabdallah, Yacine Challal, "Performance Evaluation of Load Balancing in Hierarchical Architecture for Grid Computing Service Middleware", *International Journal of Computer Science*, Vol: 8, Issue 2, PP.213, 2011.
- [12] Ardagna D, Trubian M, Zhang L, "SLA based resource allocation policies in autonomic environments", *Journal of Parallel and Distributed Computing*, Vol: 67, Issue 3, PP. 259-270, 2007.
- [13] Indraneel S. Kulkarni, Dario Pompili, "Task Allocation for Networked Autonomous Underwater Vehicles in Critical Missions", *IEEE journal on selected areas in communications*, vol: 28, Issue 5, PP.716, 2010.
- [14] Dimokas N, Katsaros D, Manolopoulos Y, "Energy-efficient distributed clustering in wireless sensor networks", *Journal of Parallel and Distributed Computing*, Vol: 70, Issue 4, PP. 371-383, 2010.
- [15] Omara F.A, Arafa M.M, "Genetic algorithms for task scheduling problem", *Journal of Parallel and Distributed Computing*.

Cloud—A Solution to Piracy

Mohit Mayunk Bhutani and Sahil Aneja

Student MBA Tech, NMIMS University, Mumbai

Abstract—An Expert said that pirated software often includes damaged or incomplete programs, which can hurt productivity or function incorrectly. Consumers using pirated software generally do not get access to product support, instructional materials, or low-cost product upgrades. Businesses using illegal software can be subjected to legal action, fines, and low productivity. In addition, pirated software can also include computer viruses which can destroy data on a user's hard drive. In a conference Larry Bridwell, virus expert at National Computer Security Association said "One of the best ways to avoid computer viruses is to only use legitimate software from reputable sources. Using pirated software is an open invitation for computer viruses".

One of the major causes for the usage of pirated software is the high cost. Steve Wozniak (creator of the Apple II) said the following words in Apple World Convention in 1986 "You can believe what you want to believe, but it's hard to say that anyone with \$20 a month in allowance money is going to buy \$150 pieces of software. They might have copied it, but they did not steal \$150, because they could not have afforded to buy it".

Changing the software delivery model from distributable media or "downloadable" to a subscription approach may at some point complicate software piracy. The cloud computing approach is done on a subscription basis similar to how one pays for electricity from the Dakshin Haryana BijliVitrans Nigam (DHBVN) or Internet service from BSNL or Bharti. One pays a miniature amount for the usage of software's on the cloud. With cloud computing, the software programs one uses don't run from one personal computer, but are rather stored on servers accessed via the Internet which reduces the overall cost of usage of software's. Instead of focusing on the application and what it can do, the focus is on what you need done and how the application can do it for you.

The paper highlights the usage of cloud computing for reducing piracy and also the feasibility of the concept. The paper also focuses on the impact of cloud on the co-corporate world, how will the software and IT companies benefit from this concept.

Keywords: Cloud Computing, IaaS, PaaS, DaaS, Reserved Instance, Demand Instance

INTRODUCTION

Software piracy is defined by the BSA as the unauthorized copying or distribution of copyrighted software. The desire to save money is a key motivator to piracy. The people having low income cannot afford to buy the software so they go for pirated version.

Others factors that instigate piracy are per capita GNI, IT shares of economy and government corruption. It can be assumed that per capita GNI is inversely proportional to the software piracy as wealthier people do not require pirating software. The country's whose economy is dependent on IT sector hence will help protecting the industry through IPR. The countries which have high corruption rate will help less in curbing the piracy.

There are two theories that define the main reasons behind the software piracy.



Fig. 1: Diagram Showing Neutralization Theory

The Techniques of Neutralization [1] or A Theory of Delinquency, questions the idea of a delinquent sub-culture which rejects the values of 'respectable society' and maintains its own values and norms. The application of neutralization techniques have been used to research a diverse range of crimes including drug-use, hate crimes, tax evasion and deer poaching. Given this diverse application we believe that neutralization techniques can be applied to help understand

software piracy. The main question that intrigues are mind is the justification of such delinquency through rationalization that helps to mitigate and diminish the influence of social norms and controls which inhibit such behaviour. These rationalizations are called as the 'techniques of neutralization' and advance seven types, which include 'condemnation of the condemners', 'denial of injury', 'appeal to higher loyalties', 'denial of responsibility', and 'denial of the victim', 'metaphor of the ledger' and the 'defence of necessity'. The 'condemnation of the condemners' the wrongdoer justifies his actions by shifting his blame to those who oppose his behaviour. The wrongdoer may, therefore, view the police as 'brutal', 'corrupt' or 'stupid'. [2]

The 'denial of injury' involves the perception of minimum or no harm to the victim. Thus a theft may be considered as mere borrowing. With 'metaphor of the ledger' an individual compares their criminal (a debit) with their law-abiding behaviour (a credit). The individual, therefore, rationalizes the former as insignificant and justified compared with their overall honest actions. The 'appeal to higher loyalties' means shifting of loyalty of a delinquent towards a criminal group rather than a law abiding one. The 'defence of necessity' enables the individual to rationalize their criminal behaviour as unavoidable. The white-collar criminal may argue that while certain business activities may be illegal (e.g. bribes), they are commonplace and necessary to remain competitive. The 'denial of responsibility' refers to a delinquent justifies his actions by claiming to be led into this due to impact of others. Through the 'denial of victim' the offender claims to be just saying victim was absent.

The Deterrence theory was developed in part to explain situational elements in the context of a crime. [3] This model also includes the moral beliefs about an act. Formal sanctions are first such method in which penalties are imposed on undesirable behaviour. Shame as a deterrent in addition to formal sanctions refers to a feeling of guilt or embarrassment if others knew of one's socially undesirable actions. [4] Moral beliefs are the most important of all as a factor of deterrent as an offender may refrain from his actions by considering it to be morally wrong.

LOSSES DUE TO PIRACY

As long as there's a market, there will be a black market. The Software & Information Industry Association (SIIA) assesses the worldwide losses due to piracy at about \$12 billion. The Business Software Alliance (BSA) and SIIA's joint research shows that the piracy rates are highest in Asia/Pacific region with an average of 51%, with some countries having a piracy rate above 95%. Even in the U.S., where the piracy rates are smallest, the losses due to piracy are estimated at 24%. SIIA also documented that over 90% of the software being sold on the Internet auction sites is illegitimate. Founded in Moscow in 1993, Drink or Die became famous among software pirates when it released a copy of Microsoft Windows 95 two weeks before the program went on sale. Software piracy cost the United States economy dollars, jobs, and tax revenue. The United States lost more than 100,000 jobs and over a billion dollars in tax revenue in 2000 due to software piracy.

	1997	1998	1999
Western Europe	2519	2760	3630
Central Europe	561	640	409
North America	3074	3196	3631
Latin America	978	1045	1128
Asia Pacific	3916	2955	2792
Middle East	206	190	284
Africa	186	190	194
World Total	11440	10976	12163

Table 1: The table shows losses in million US Dollars in the last decade due to piracy in various States.

One Consumers' market behavior does not help producers to accurately estimate demand. Thus piracy thwarts market coordination as it distorts the price mechanism and forces producers to make inefficient production decisions. In the presence of piracy, producers are confused about actual market demand for various products, which leads to a market coordination failure. Overproduction and misallocation of resources occur in every session of the new market treatment. [5] The producers are unable to cover costs and their production is unsustainable in the long run. Piracy transfers wealth away from producers to consumers, thus hurting producers.

Businesses using illegal software can be subjected to legal action, fines, and low productivity. In addition, pirated software can also include computer viruses which can destroy data on a user's hard drive. In a conference Larry Birdwell, virus expert at National Computer Security Association said "One of the best ways to avoid computer viruses is to only use legitimate software from reputable sources. Using pirated software is an open invitation for computer viruses"

The distribution of pirated software was limited mainly to elite hobbyist groups via hand and mail delivery and connections between two computers using a modem at the speed of 300 baud (30 bits per second). To remain anonymous, most groups used P.O. Boxes. With the National Science Foundation lifting the restriction on commercial use of the Internet, cleared the way for the age of electronic commerce. This opened the flood gates for software piracy. Users started offering pirated software on various venues of the Internet such as USENET, IRC (Internet Relay Chat), and FTP (File Transfer Protocol) sites. USENET is an international massaging board where one user posts a message to a news server and then that server propagates the message to other news servers around the world. In addition to text messages,

users could also post binary files and thus the birth of piracy over USENET was born. In fact, at the present time, one can find many pirated software titles including every Microsoft title ever made on USENET. 200 gigabytes of data per day are currently passed through USENET making investigation of the people posting pirated software a very difficult task.

Software pirates opened their own secret chat channels to distribute files and to hold meetings with their respective members. [6] The channels can be made locked in that only people knowing the password can get in or the channel can be hidden from the channel list, thus someone only knowing the exact channel name will be able to “find” the channel and enter it. Using special scanning programs pirates look for public FTP sites that allow uploads and downloads of binary files. Once a pirate finds a viable site (i.e. one that is fast and people can both upload and download from), the pirate will make a secret directory and then transfer the pirated software into this directory. After doing so, he or she will usually let the other members of the warez group know where the files are so that they may download them and distribute them to other places (e.g. IRC or USENET).

Product activation is included in Office XP. About month before its official release, someone obtained a copy of the corporate version of Office XP which does not require an activation key, and posted it on the Usenet newsgroup alt.binaries.warez.ibm. What is surprising is what Lisa Gurry, product manager for Office had to say about this:

“The activation technology was developed to prevent against casual piracy, and that is typically piracy when a consumer shares their software with someone else outside the terms of the licensing agreement. We don’t think most of our users will be out on the Web trying to find ways to steal software” (Patrizio).

It seems that Microsoft is not trying to prevent piracy between pirates, but between users themselves, even though Internet piracy costs them substantially more in revenue. Legitimate users are punished for other’s misdeeds.

Software piracy is a problem that stems from a basic lack of respect and value of intellectual property. It is painfully frustrating and aggravating to the creators of such property because it denies them all the benefits that one is entitled to when one develops a commodity. Software piracy occurs because software developers put software on distributable media which facilitates duplication. It is like a musician who makes music and puts it on CDs to sell to consumers. Instead of buying the CD, a few consumers might find it convenient and cheaper to duplicate or “burn” copies of it despite all of the recent security features placed on them. But what if the software is not put on an easily distributable media? What if it is provided only through subscription? What if companies including Microsoft put their software in the “Cloud” or on the Internet? What if Windows 7 can only be provided through the Cloud/Internet, would there still be pirated copies of it? Is cloud computing the ultimate solution to the age-old software piracy problem?

There are two schools of thought regarding this issue? One school of thought believes that cloud computing will eliminate software piracy. The other school of thought believes that cloud computing will only give birth to a new software piracy paradigm.

The major reason as stated above for software piracy is the price of the software. One does not want to pay a huge amount for a software which they will use only for a short period of time as a result to save money they prefer using a pirated version of the software rather than paying a huge sum of money. Cloud provides a solution to this problem in particular as one will pay for what they use.[7]This concept of paying for what one uses is called SaaS (Software as a Service).

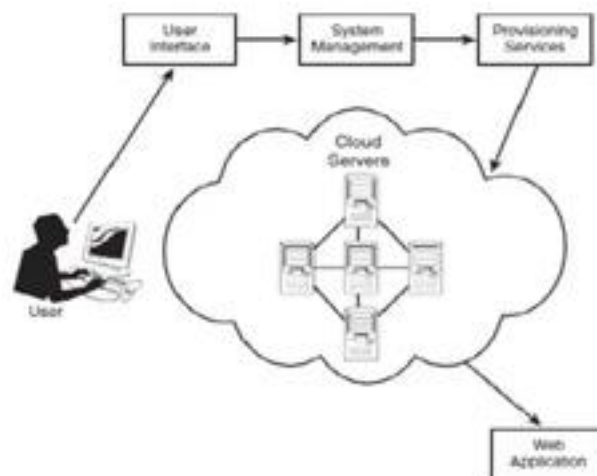


Fig. 2: The Figure Illustrates a User Working on Cloud

Cloud computing portends a major change in how we store information and run applications. Instead of running programs and data on an individual desktop computer, everything is hosted in the “cloud”—a nebulous assemblage of computers and servers accessed via the Internet. Cloud computing lets you access all your applications and documents

from anywhere in the world, freeing you from the confines of the desktop and making it easier for group members in different locations to collaborate.

The cloud is a collection of computers and servers that are publicly accessible via the Internet. This hardware is typically owned and operated by a third party on a consolidated basis in one or more data centre locations. The machines can run any combination of operating systems; it's the processing power of the machines that matter, not what their desktops look like.

Cloud has intellectual property interwoven and thus it cannot be copied as against to traditional programmers that require the use of DVD sets. The cloud based services will also help the entertainment devices protect their intellectual rights better.

Low Software Cost

Then there's the issue of software cost. Instead of purchasing separate software packages for each computer in the organization, only those employees actually using an application need access to that application in the cloud. Even if it costs the same to use web-based applications as it does similar desktop software (which it probably won't), IT staffs are saved the cost of installing and maintaining those programs on every desktop in the organization.

As to the cost of that software, it's possible that some cloud computing companies will charge as much to "rent" their apps as traditional software companies charge for software purchases. However, early indications are that cloud services will be priced substantially lower than similar desktop software. In fact, many companies (such as Google) are offering their web-based applications for free—which to both individuals and large organizations is much more attractive than the high costs charged by Microsoft and similar desktop software suppliers.

Instant Software Updates

Another software-related advantage to cloud computing is that users are no longer faced with the choice between obsolete software and high upgrade costs. When the app is web-based, updates happen automatically and are available the next time the user logs in to the cloud.[8] Whenever you access a web-based application, you're getting the latest version—without needing to pay for or download an upgrade.

Latest Version Software Availability

And here's another document-related advantage of cloud computing. When you edit a document at home, that edited version is what you see when you access the document at work. The cloud always hosts the latest version of your documents; you're never in danger of having an outdated version on the computer you're working on.

While we believe that Cloud computing has many benefits and can certainly "decrease" or can complicate software piracy, we do not honestly believe that it can or will eradicate software piracy completely. We do, however, believe it will promote ubiquitous computing though! In the subsequent paragraphs, we will state the reasons why we believe cloud computing may not be able to totally solve the problem of software piracy.

Changing the software delivery model from distributable media or "downloadable" to a subscription approach may at some point complicate software piracy but it won't necessarily discourage software pirates from finding an alternative approach. There is no guarantee that software pirates will not devise a new approach or find new means to pirate software. The cloud computing approach is done on a subscription basis similar to how one pays for electricity from the Dakshin Haryana BijliVitrán Nigam (DHBVN) or Internet service from BSNL or Bharti.

In earlier days people would share things in order to reduce the cost of the service. [9]This still occurs today where people share cable TV connections with neighbors or family members who live within close proximity of each other to avoid paying the requisite bills. If this is occurring with basic utilities, what could possibly prevent pirates from sharing sessions or connections to the cloud with others?

Not to sound cynical, but as long as cyber criminals and hackers exist, software piracy will also exist. In the open source community there is a belief that cloud computing simply takes freedom away from the user; that it strangulates innovation and creativity. To members of the open source community, cloud computing does not differ from proprietary software since it does not permit access to its source code. What good is a product that you cannot tinker with? What good is a car whose hood you cannot open?

The risk of putting data in the cloud is a deterrent to a lot companies. The concentration of software in remote data centers makes the data susceptible to cyber attacks and that is scary to a business entity.[10] Other reasons are the inability on the part of companies to have full control of servers in the cloud where their data is being stored, privacy issues, and the possibility that the cloud service providers could be dissolved making data retrieval impossible. Because of all the reasons just mentioned software companies will continue to develop and deliver software via traditional media to accommodate those who are slow to adapt the cloud paradigm or who simply refuse to run their IT department in the cloud.

CONCLUSION

Cloud does provide solution to piracy. It can reduce piracy by a great extent as no software can be downloaded and everything will be online. One will have to pay the services which they use. The corporate world will be at a boom with this technology as the software cost reduces by a huge amount. Also the software developing companies suffer less loss as one has to pay for using their software.

There is still resistance to cloud based computing from many users. Using an application in the cloud requires the user to maintain a constant connection to the vendor's servers. Users see two problems with this. Firstly there is the technical issue. The world is not yet blessed with blanket, high quality broadband internet access and this is what you need to make cloud computing work. For many people, in many places getting and maintaining an internet connection is still a hit and miss activity and in these situations cloud based apps are simply a non-starter."

"The second issue is one of privacy and security. The maintenance of a constant connection to the vendor's servers means a constant exchange of information between the user and the vendor. Many users both corporate and consumer are not comfortable with this and it is going to take quite a shift in thinking before that changes."

We are sure in the future some of these problems will be overcome and server only software will be more prominent. But even when this does happen so many apps need to have client-side software running for various reasons that the "protection" from software piracy offered by a cloud based license could turn out to be a red herring. And we must remember that whenever a new technology is introduced there will be someone out there putting time and effort into "cracking" that technology, if the financial reward to be had. We can be pretty confident that software piracy will find some way around any protection that seems to be offered by cloud computing solutions."

ACKNOWLEDGMENT

The author would like to thank Mr. Sanjay Pande for helping me out with this management paper. The author would also like to thank ESDS and Virtual Dimension company for helping him conduct live demonstration for this project. The author would also like to thank the team of Zephyrus On Demand Computing without whose support this project would just have been a project. In the end the author would like to sincerely thank all the authors who have conducted research on cloud computing without whose help this work wouldn't have been possible.

REFERENCES

- [1] Anthony Vance "New Insight for an Old Problem: Explaining Software Piracy through Neutralization Theory," In 43rd Hawaii International Conference on System Sciences-2010.
- [2] L. A. Elis and S. Simpson, "Informal Sanction Threats
- [3] and Corporate Crime: Additive Versus Multiplicative
- [4] Models," *Journal of Research in Crime and Delinquency*, 20
- [5] (1995), pp. 233-252.
- [6] R. L. Akers and C. S. Sellers, *Criminological Theories: Introduction, Evaluation, and Application*, Roxxy, Los
- [7] Angeles, CA, 2004.
- [8] Mikko Siponen, Anthony Vance , Robert Willison "New Insights for an Old Problem: Explaining Software Piracy through Neutralization Theory,"
- [9] Ram Gopal, Alok Gupta, "Trading Higher Software Piracy for Higher Profits: The Case of Phantom Piracy," *Proceedings of the 35th Hawaii International Conference on System Sciences - 2002*
- [10] Kenneth T. Fougere, Laurie E. MacDonald, "Software Piracy: A Study of the Extent Of Coverage in Introductory MIS Textbooks,"
- [11] Adam Leinss, "The Effects of Software Piracy on Consumers and Software Developers," For CS-699 Independent Study under Dr. Levine.
- [12] Stefan Ried, "Platform as a service market sizzling" Forrester Publication, July 13, 2009.
- [13] Noel Yuhanna "Database As a service Explodes on the scene," Forrester Publication, July 2008.
- [14] John R. Rymer "How to Swift through Options," Forrester Publication April 2009.
- [15]

Awareness of Various Methods and Techniques of Green Computing in Offices of Delhi-NCR

Madhur Raj Jain¹ and Aditi Midha²

Associate Professor, Jagannath International Management School, Kalkaji

Abstract—Green computing is turning out to be an essential part of human living nowadays. Green computing is the environmentally responsible use of computers and its related resources. Computing can be generally defined as using the computer and its peripherals with the conservation of the environment in mind. Green computing not only has a lot of advantages; it can also be implemented by everyone as in future nobody can avoid this because of lack of resources. This topic was selected by keeping in mind that awareness level of green computing is increasing as various organisations have issued notification regarding efficient use of energy resources in Delhi-NCR region. A sample of 120 employees from 15 different organisations/offices was taken to know the awareness level of use of methods and techniques of green computing in day-to-day life of human being. A 5-point likert scale was taken for testing the statements of Green computing to the various employees of NCR.

Keywords: Green computing, Delhi-NCR, ANOVA, Computer peripherals, Likert Scale.

INTRODUCTION

Green Computing is a discipline that studies, develops and promotes techniques for improving energy efficiency and reducing waste in the full life cycle of computing equipment from initial manufacture, through delivery, use, maintenance, recycling and disposal in an economically realistic way. While it is daunting to consider the ways in which the widespread use of computers is contributing to waste, it is encouraging to recognize that computer science researchers and educators can pursue solutions to reduce this wastefulness.

"Green" has become a popular term for describing things that are good for the environment, generally healthful and, more recently, economically sensible (Horvath A. & Masanet E., 2006). "Going Green" implies reducing your energy use and pollution footprint. The technology community, specifically computer users, have popularized the term "Green Computing," which is the reduction of the pollution and energy footprint of computers. While the goal of a truly paperless toward Green Computing. Technologies such as inexpensive scanners, large and affordable storage devices, and widespread use of PDF files have reduced paper in the modern office, although the truly paperless office is rarely realized even as interest in green approaches has risen.

With computing technology firmly woven into the fabric of daily life, computer science educators are ideally suited to contribute to Green Computing education and research. The introduction of green technology projects such as the Low Carbon ICT Project at the University of Oxford are indicative of a positive trend, although there is significant opportunity for theoretical and experimental research to be performed by computer scientists (Prothero A. & Fitchett J.A., 2000). Computer science educators can lead the way by incorporating Green Computing ideas into the curriculum and by making these ideas and techniques accessible to educators in other disciplines. Due to the rising cost of energy, depletion of natural resources and increasing concern for the environment by the general population, sensitivity to an interest in the issues of Green Computing are high. While the Earth has existed for perhaps 4.5 billion years, in just the past 30 years one-third of the Earth's natural resources have been consumed. Clearly, this pace of consumption is not sustainable from a practical perspective, suggesting that techniques for reducing consumption are needed.

APPROACHES AND ISSUES

As population is continuously increasing, energy use has also increased with same pace. The widespread use of technology, particularly computers, means that computer power consumption is a topic of concern, with increases in computer energy consumption leading to increases in pollution and related side-effects. The negative side-effects of the computing life cycle include pollution in the form of carbon dioxide from power plants and transportation, lead and mercury from manufacturing processes and power plants, and other toxic materials used in the production, use and disposal of computers. Computers that are less efficient use more electricity which leads to increased pollution. The need for Green Computing is thus quite clear, yet empirical studies and formalized recommendations have been slow in coming (K. Brigden and D. Santillo, 2006).

Energy efficiency is currently the easiest and cheapest way to reduce our use of fossil fuels, for both computers and other electrical devices. In India, where electricity costs are still relatively low compared with many other countries, alternative sources of electricity such as photovoltaic and wind turbines are still cost prohibitive for many. Although these technologies are likely to become more affordable, cost is still the primary factor inhibiting early adoption. Rise of company like Suzlon Energy and Reliance Power are the clear example of Indian concern over green computing.

There is a growing consensus that improving energy efficiency will reduce pollution and save money. The matters in question are how to go about implementing efficiency improvements, how to improve these methods and create new methods, and how best to spread this knowledge by engaging computer experts and lay people.

The motivation to reduce waste through Green Computing is clear, although identifying appropriate Green techniques for a given situation from among the many available is challenging. One of the easiest ways to reduce consumption and pollution is to reduce use. Reducing consumption by printing documents double-sided, viewing documents on-screen, powering off electrical devices that are not in use, placing a computer in sleep mode or powered off when not in use, and similar techniques are effectively free, save for the minimal extra effort involved.

Computers in particular are ideal candidates for reducing power consumption, with easy-to-use features such as automatic sleep mode which shuts down an idle computer after a configurable period of inactivity. Using power management settings is a common strategy for reducing energy consumption and carbon dioxide emissions. Replacing computers less frequently can also significantly reduce energy and environmental waste because manufacturing PCs is an energy intensive process and many old computers are still sent to landfills in the United States.

Although the technical challenges of Green Computing are not overly complex, perhaps the largest issue is that of changing the behaviour of computer users. Technical challenges include finding the optimum system configuration settings and balancing energy efficiency with classroom or business requirements, which are within reach of a deliberate research and administrative effort. Computer users, however, are often used to leaving machines powered on as a convenience, and system administrators often count on this situation to conduct automated software updates and nightly file system backups. Although solving the social and behaviour issues involved with Green Computing pose a significant challenge, there can be little forward movement without concrete and workable solutions to the technical issues. While individual effort is important, organized research activities are vital if these solutions are to be found.

LITERATURE REVIEW

Lot of literature is available outside India regarding green computing and awareness about the green computing but in India the awareness have just started. Lot of companies and government agencies started to have paperless offices. Even Railway ministries have initiated with a circular that there is no requirement of carrying with a paper ticket for those commuters who are booking their ticket on line. They can carry the image of the ticket bearing PNR number on their mobile or to the laptop with valid proof of their personal ID card. Paperless office was advocated by Anthony J. in his paper in 2008, he describes the way and methods how one can achieve paperless office with ease. Similar thing were advocated by Citrone L. in his paper in 2008.



Fig. 1

Some of the way suggested in the various literature are as follows; Using electronic handouts, via PDF or HTML for instance, online forms, tests and quizzes, scanning archival copies of documents rather than printing, and printing those documents that must be printed double-sided when possible are techniques that can reduce paper waste and energy use (David Przybyla and Mahmoud Pegah, 2007). Powering down equipment is the simplest, most effective and most obvious way to reduce computing power consumption (Bruce Nordman, Alan Meier and Mary Ann Piette, 2000). A computer can place its hard disk drives in a low power sleep mode when they are idle. Hard disk drives on desktop computers can use 10 watts or more when in use. System standby is one of the most effective power saving features. After a preset idling period, a computer will shutdown most of its components significantly reducing power use. The hibernate mode goes one step further than standby mode by completely powering off the computer. Invoking the hibernate mode causes the memory state to be saved onto the hard disk before powering down (Mujtaba Talebi, 2008). Eliminate Phantom loads,

such as the 3 watts used by the hibernate mode, occur when electrical devices appear to be powered off but continue to consume electricity (William H. Kemp, 2006). Hasan and Burns devised a five-tier pyramid of options, inspired by real-world waste reduction tactics:

OBJECTIVES OF THE STUDY

This study has the following objectives:

- To study the ways and tools adopted to cope up the problem of energy in the offices of Delhi-NCR.
- To know the awareness level of the employees of Delhi-NCR towards ways and methods of saving energy in the office premises and houses.
- To know the efforts of government and government agencies in this direction.
- To know perception level of the employees over the methods adopted for saving energy.

METHODOLOGY

The study is based on the survey of 120 employees from 15 different organisations/offices was taken to know the awareness level of use of methods and techniques of green computing in day-to-day life of human being. To cover the views of government even some of the employees of Municipal Corporation of Delhi were also bring to this survey. This survey was completed in the period of December 2011 and January 2012. Help of PGDM and MBA students were taken to complete this survey with the motive of training them in to the process of data collection and giving them exposure to interview techniques in the guidance of faculty members. Close-ended questionnaire was developed. Likert Scale was used to measure the opinion of people. As the study was on the Office premises of Delhi and NCR so some of the companies/ organisations covered are NIIT, Intertek, NTPC, Power Grid corporation of India, MCD, Bony polymer, Halonix, New Holland tractors etc.

Correlation, ANOVA and cross-tabulation were major tools used for statistical analysis apart from usual graphical and tabular method of percentage Analysis.

HYPOTHESIS

- Awareness level of employees is very high
- Efforts are very less as compare to awareness level amongst the employees.
- Government employees are aware of the various the ways of green computing but efforts are almost negligible.
- Young people are more aware as compared to the middle level or top level management employees.

ANALYSIS & INTERPRETATION:

Analysis of data explored the following information about the educational background, age profile and gender.

Table 1: Demographic Profile of Employees

Demographic Parameters	Frequency	Percent
Educational Qualifications		
Graduation	46	38.83
Post Graduation	25	20.83
Professional Qualification	49	40.83
Total	120	100.0
Age Group		
20-30 years	12	10.0
30-40 years	48	40.0
40-50 years	36	30
above 50 years	24	20
Total	120	100
Gender		
Male	76	63.33
Female	44	36.67
Total	80	100.0
Managerial Level		
Lower Level Management	64	53.33
Middle Level Management	44	36.67
Top Level Management	12	10
Type of organisation		
IT	28	23.33
Retail	32	26.67
Banking	22	18.33
Insurance	28	23.33
Consultancy	10	8.34

Table 1: describes the demographic profiles of the employees undergone for the surveys, 63.33 percent of the employees were male and 36.67 percent employees were female. Maximum respondents in the survey, 53.33 percent were from lower level management. 36.67 percent were from middle level management. Maximum respondents i.e. 40.83 percent employees were having professional qualifications, 38.83 percent were having only graduations as educational qualification and 20.83 percent were having post graduate degree as qualification. Maximum Respondents were from the Retail organisation followed by IT and Insurance sector i.e. 23.33 percent each.

Table 2: Cross tabulation between Level of awareness of term Green Computing and Number of respondents Managerial level wise

Statements	Number of Employees (in Percentage)			Total
	Lower Level Management	Middle Level Management	Top Level Management	
Awareness of Term Green Computing	43.75	81.8	58.33	59.16
Awareness of all Green Computing ways and issues	(66.25)	(18.9)	(41.67)	(48.84)
	31.25	45.45	50(50)	38.33
	(68.75)	(54.55)		(61.67)
My organization does all initiatives to enhance Green Computing.	31.25	40.90	41.67	36.67
	(68.75)	(59.10)	(58.33)	(63.33)

Figures in Brackets represents the percentage of people answers in 'No' response.

In response to the query, about awareness level of green computing 66.25 percent of the lower level employees of Delhi NCR region were unaware about it. In comparison to lower level employee and top level employees, awareness level of middle level employee's awareness found to much more, which indicates that younger generation employees despite use of internet were not keen on the environmental aspects. Hypothesis that the awareness level of the employees of Delhi NCR region is very high is rejected as overall awareness level comes out to be 59.16 percent which considerably low as compared to the awareness amongst the middle level employees awareness level.

In response to the query whether you are aware about all ways and the issues related to green computing, top level management i.e. 6 managers were found more aware than middle and lower level management employees. In response to the query whether their organisation does all initiative to enhance green computing, 40.90 percent of the middle level management employees responded positively that their organisations were doing enough but during the interview with some of them they responded that still lot to be done in this regard. On overall basis 63.33 percent employees found to be unsatisfied that their organisation were not doing enough over the initiatives of green computing.

Table 3: Comparison of Awareness level of Green Computing Ways and Methods Amongst the Employees on the Basis of Educational Qualification

Sources of Variation	Sum of Squares	df	Mean Square	F
Between Groups	8.864	2	4.432	7.165
Within Groups	72.375	117	0.6186	
Total	81.239	119		

Table 3; test the hypothesis that there is no significant difference in the awareness level of Green computing ways and methods on the basis of different educational qualification of the respondents. Using analysis of variance (ANOVA) test, null hypothesis was tested which shows that since the calculated value of ' $F_{0.05}$ ' (7.165) is greater than the tabulated value. So the null hypothesis was rejected at 5% level of significance, which reflects that there is a significant difference in the awareness level as far as the educational qualification is concerned. Awareness level is higher when the educational qualification increases.

Table 4: Comparison of Awareness level of Green Computing Ways and Methods Amongst the Employees on the Basis of Managerial Level

Sources of Variation	Sum of Squares	df	Mean Square	F
Between Groups	7.564	2	3.782	6.521
Within Groups	67.896	117	0.580	
Total				

Table 4; test the hypothesis that there is 'no significant difference in the awareness level of Green computing ways and methods on the basis of different managerial level', of the respondents. Using analysis of variance (ANOVA) test, null hypothesis was tested which shows that since the calculated value of ' $F_{0.05}$ ' (6.521) is greater than the tabulated value. So the null hypothesis was rejected at 5% level of significance, which reflects that there is a significant difference in the awareness level as far as the Managerial level is concerned. Awareness level is higher when the managerial cadre increases from lower to middle level.

Example

Consider a group of people who share similar demographic information and who buy similar products from the Adventure Works Company. This group of people represents a cluster of data. Several such clusters may exist in a database. By observing the columns that make up a cluster, you can more clearly see how records in a dataset are related to one another.

HOW THE ALGORITHM WORKS

The Microsoft Clustering algorithm first identifies relationships in a dataset and generates a series of clusters based on those relationships. A scatter plot is a useful way to visually represent how the algorithm groups data, as shown in the following diagram. The scatter plot represents all the cases in the dataset, and each case is a point on the graph. The clusters group points on the graph and illustrate the relationships that the algorithm identifies.

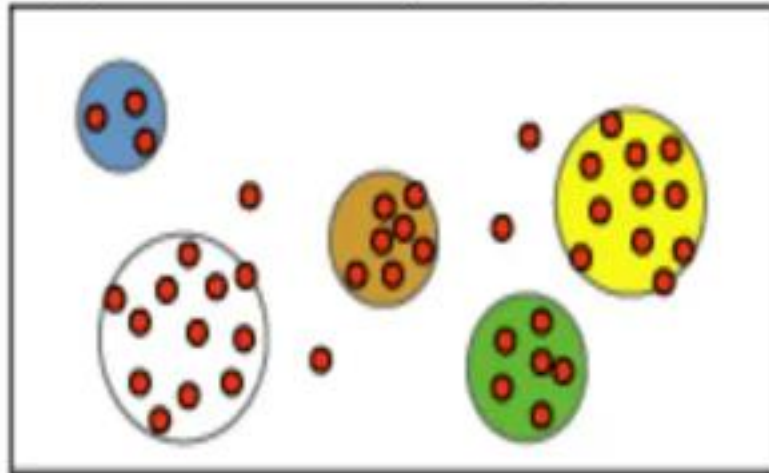


Fig. 3: Scatters Plots in a Data Set

After first defining the clusters, the algorithm calculates how well the clusters represent groupings of the points, and then tries to redefine the groupings to create clusters that better represent the data. The algorithm iterates through this process until it cannot improve the results more by redefining the clusters.

The Microsoft Clustering algorithm offers two methods for calculating how well points fit within the clusters: Expectation Maximization (EM) and K-Means. For EM clustering, the algorithm uses a probabilistic method to determine the probability that a data point exists in a cluster. For K-Means, the algorithm uses a distance measure to assign a data point to its closest cluster.

THE K-MEANS ALGORITHM

The k-means algorithm is an evolutionary algorithm that gains its name from its method of operation. The algorithm clusters observations into k groups, where k is provided as an input parameter. It then assigns each observation to clusters based upon the observation's proximity to the mean of the cluster. The cluster's mean is then recomputed and the process begins again. Here's how the algorithm works:

The algorithm arbitrarily selects k points as the initial cluster centers ("means").

1. Each point in the dataset is assigned to the closed cluster, based upon the Euclidean distance between each point and each cluster center.
2. Each cluster center is recomputed as the average of the points in that cluster.

Steps 2 and 3 repeat until the clusters converge. Convergence may be defined differently depending upon the implementation, but it normally means that either no observations change clusters when steps 2 and 3 are repeated or that the changes do not make a material difference in the definition of the clusters.

Choosing the Number of Clusters

One of the main disadvantages to k-means is the fact that you must specify the number of clusters as an input to the algorithm. As designed, the algorithm is not capable of determining the appropriate number of clusters and depends upon the user to identify this in advance. For example, if you had a group of people that were easily clustered based upon gender, calling the k-means algorithm with $k=3$ would force the people into three clusters, when $k=2$ would provide a more natural fit. Similarly, if a group of individuals were easily clustered based upon home state and you called the k-means algorithm with $k=20$, the results might be too generalized to be effective.

Table 5: Responses on the Various Statements on the Green Computing

Parameter	No. of Respondents	Percentage of Respondents
Green Computing has Little or no Effect on Environment		
Strongly Agree	8	6.67
Agree	7	5.83
Neutral	17	14.17
Disagree	48	40
Strongly Disagree	40	33.33
Total	120	100
I Endorse Green Computing to my Colleagues and Superiors and Juniors		
Strongly Agree	44	36.67
Agree	34	28.33
Neutral	6	5
Disagree	16	13.33
Strongly Disagree	20	16.67
Total	120	100
Green Computing is My Duty Towards the World		
Strongly Agree	56	46.67
Agree	45	37.50
Neutral	19	15.83
Disagree	0	0
Strongly Disagree	0	0
Total	120	100
All Equipments we use Either in the Office or in the House Were Bearing Energy Efficiency Star Rating		
Strongly Agree	12	10
Agree	24	20
Neutral	4	3.33
Disagree	47	39.17
Strongly Disagree	33	27.50
Total	120	100

From table 5; in response to the statement that green computing has little or no effect, 40 and 33.33 percent of the employees were either disagree or strongly disagree respectively. This indicates that employees were feeling or understanding the effect of the green computing. In response to the query that I endorse my green computing to my colleagues or seniors, 36.67 or 28.33 percent of the employees were either Strongly agree or agree with the statement. In response to the query that 'Green computing is the duty towards world', maximum employees i.e 84.17 percent of the employees were strongly agree/ Agree on the statement. In response to the query, 'All equipments we use either in the office or in the house were bearing energy efficiency star rating', 39.17 percent of the employees were disagree and 27.50 percent employees were strongly disagree with the statement only 30 percent responded positively in this response that in their offices energy efficient equipments were used.

In response to the statement in the Table 6 that Use of CRT monitor consume more power almost 50 percent of employees responded negatively which shows high ignorance level of the employees. In response to the query that physical smaller drive consume less power very high ignorance level comes out during the survey, 74.17 percent of the employees were not aware about it. In response to the query, that i know all power management techniques, will shows encouraging responses that 84.17 percent responded that they are aware of it, When asked in detail which technique you aware of they all start about traditional things like; Switch off the unnecessary light, use energy efficient electric or electronic equipments and use of CFL etc. They are not aware of latest techniques and ways.

In response to the query that 'I am aware that lead free computing is one form of Green computing, 66.67 percent of the employees shows their ignorance level which is considerably high. In response to the query that 'I am aware that keeping the Desktop/ Laptop in hibernate mode or sleep mode when not in use lead to green computing, 70 percent of the employees were not aware about it in the form of either disagree with the statement or strongly disagree with the statement. In response to the query that 'I am aware that monitor sleep mode or use of screen saver leads to green computing and save energy', 58.33 percent of the employees agree that they are aware of it.

Table 6: Responses on the Various Statements on Ways to Achieve Green Computing

Parameter	No. of Respondents	Percentage of Respondents
I Am Aware that CRT Monitors use More Power than LCD Monitors		
Strongly Agree	24	20
Agree	25	20.83
Neutral	11	8.33
Disagree	32	26.67
Strongly Disagree	28	23.34
Total	120	100

Table 6 (Contd.)...

... Table 6 (Contd.)

I Am Aware that Physically Smaller Drives use Less Power Than Larger Ones		
Strongly Agree	12	10
Agree	13	10.83
Neutral	6	5
Disagree	49	40.83
Strongly Disagree	40	33.34
Total	120	100
I Am Fully Aware Of All Power Management Techniques		
Strongly Agree	56	46.67
Agree	45	37.50
Neutral	19	15.83
Disagree	0	0
Strongly Disagree	0	0
Total	120	100
I am Aware that Lead Free Computing is One form of GC		
Strongly Agree	11	9.17
Agree	25	20.83
Neutral	4	3.33
Disagree	47	39.17
Strongly Disagree	33	27.50
Total	120	100
I am Aware that Keeping the Desktop/ Laptop in Hibernate Mode or Sleep Mode When Not in use Lead to Green Computing		
Strongly Agree	12	10
Agree	15	12.5
Neutral	9	7.5
Disagree	56	46.67
Strongly Disagree	28	23.33
Total	120	100
I am Aware that Monitor Sleep Mode or use of Screen Saver Leads to Green Computing and Save Energy		
Strongly Agree	25	20.83
Agree	45	37.50
Neutral	2	1.67
Disagree	28	23.33
Strongly Disagree	20	16.67
Total	120	100

CONCLUSION

There are various ways available to achieve the green computing and to save energy like, use of laptop and note books instead of desktop, switching off the light and power equipment when not in use, using less size drives for storage of data, using screen savers, frequently conducting monitor power consumption test, moving towards paperless office, purchase of energy efficient devices carrying star ratings etc. Peoples in Delhi NCR found to be mostly ignorant about the all ways and techniques by which they can save energy. A small attempt was made through this study whether the awareness level is enough or not. Employees of government offices were found equally ignorant about it though some of them were using some of the techniques. Still lot to be done in this regard from the government side to improve awareness level. Awareness level can be raised through education via various media like newspapers, TV and internet etc. Middle level management people found to be more aware than top and lower management people. Mostly people in the age group from 30-50 years were there in this hierarchy, which is a clear indication of high concern for the environment and duty towards nation.

REFERENCES

- [1] Joseph Anthony. 6 Tips for a Paperless Office. Microsoft Small Business Center, 2008.
- [2] Les Citrome. Creating a more productive, clutter-free, paperless office: a primer on scanning, storage and searching of PDF documents on personal computers, International Journal of Clinical Practice, 62(3), pp. 363-366, 2008.
- [3] Daniel P. Dem. Power plug meters help save money, energy. Computerworld, Aug. 27, 2008.
- [4] K. Brigden and D. Santillo. Determining the presence of hazardous substances in five brands of laptop computers. Greenpeace Research Laboratories Technical Report, GRLTN-05-2006, 2006.
- [5] Elizabeth Grossman. High Tech Trash: Digital Devices, Hidden Toxics, and Human Health. Island Press, Washington, 2006.
- [6] Colin Holland. Oxford University launches low carbon computing project. EE Times UK, March 14, 2008.
- [7] Arpad Horvath and Eric Masanet. Enterprise Strategies for Reducing the Life-Cycle Energy Use and Greenhouse Gas Emissions of Personal Computers. Proceedings of the 2006 IEEE International Symposium on Electronics and the Environment, pp. 21-26, 2006.

- [8] William H. Kemp. *The Renewable Energy Handbook: A Guide to Rural Energy Independence, Off-Grid and Sustainable Living*. Aztext Press, 2006.
- [9] Robert Lilienfeld and William Rathje. *Use Less tuff: Environmental Solutions for Who We Really Are*. Ballantine Books, 1998.
- [10] Bruce Nordman, Alan Meier and Mary Ann Piette. *PC and Monitor Night Status: Power Management Enabling and Manual Turn-Off*. Proceedings of the American Council for an Energy Efficient Economy (ACEEE) Summer Study on Energy Efficiency in Buildings, 2000.
- [11] Andrea Prothero and James A. Fitchett. *Greening Capitalism: Opportunities for a Green Commodity*. *Journal of Macromarketing*, 20(1), pp. 46-55, 2000.
- [12] David Przybyla and Mahmood Pegah. *Dealing with the veiled devil: eco-responsible computing strategy*.
- [13] Proceedings of the 35th annual ACM SIGUCCS Conference on User Services, Orlando, Florida, pp. 296-301, 2007.
- [14] Mujtaba Talebi. *Computer Power Consumption Benchmarking For Green Computing*. Master's Thesis, Villanova University, Department of Computing Sciences, 2008.
- [15] Abigail J. Sellen and Richard H.R. Harper. *The Myth of the Paperless Office*, MIT Press, Cambridge, MA, 2003.

An Efficient Use of Cloud Computing in e-Governance

Amit Kumar, Ajay Rastogi and Sanjeev Kumar

CMCA, TMU

Abstract—Cloud Computing is the new technology. It has been provide by many venders like Microsoft, Cisco, etc. It is a new emerging concept in the field of computing. It offers many services like Software as a service (SaaS), Platform as a service(PaaS) and Infrastructure as a service(IaaS) [1]. The collective, shared and integrated nature of all these entities is known as the Cloud. The subject of cloud computing is currently in the very early stages of development. In this paper we analyze cloud computing and examines its application in context of e-Governance. As existing e-Governance project in India are facing many challenges, from development to implementation. We propose the use of cloud computing in a e-Governance model, as a new solution.

Keywords: Cloud, ICT, Cloud Computing, e-Governance

INTRODUCTION

Indian Government want to implement the model of e-Governance on country level as well as in all states of India. The main objective is to use ICT for planning new ways of interacting, improving user services. E-Governance aims to deliver more interactive services to their citizens. E-Governance is like to be business oriented application like e-Commerce, m-Commerce. The main problem with the e-Governance is cost because of unavailability of infrastructure like Software, Hardware and Network. Cloud Computing is a new form of computing can solve various problems identified earlier and it may lead to significant cost saving with a infrastructure. The function of cloud computing is based over the use of Internet with third party hardware and software infrastructure that are remotely accessed.

INTRODUCTION ABOUT E-GOVERNANCE

e-Governance is a process of reform in the way and deliver services to internal and external users for the benefit of both government and users[5]. There is a great no of government services that can be offered online to end users in a e-Governance model.

e-Governance and requirements may be driven by economic, political, technical and cultural reasons. E-Governance requires application to be secure and protect the privacy of end users. Some of the services that can be offered by e-Governance are

- Government to Government
- Government to Enterprises.
- Government to Business.
- Government to Consumer

CLOUD COMPUTING MODELS TO OFFER E-GOVERNANCE SERVICES

Cloud Computing is a model for enabling every, convenient, on demand network access to a shared pool of configurable computing resources e.g. networks, servers, storages, application, and services that can be released with minimal management effort or service provider interaction

There are three models:

Software Model

The Computer uses an application, But does not control the operating system, Hardware or Network Infrastructure on which it is running.Cloud offers application as service. Imagine a case of a new state deciding to move to e-Governance to offer some services on districts level. They need solution for some application for their citizens. The state need not to purchase application, Hardware and Software. They can make a request for a particular service from the cloud provider. Application instances can then be created for their use. Many application can be provided as standard services, where department can manage online without wait. Some of the application can be:

Online Services under National e-Governance Plan

- Income Tax
- Passport/VISA
- Company Affairs
- Central Excise
- Pensions
- Land Records

- Road Transport
- Property Registration
- Agriculture
- Municipalities
- Gram Panchayats (Rural)
- Police
- Employment Exchange
- E-Courts



Fig. 1

In this model there is no need for each department to purchase hardware, software and application, from cloud serviced provider at district level. As with cloud the implementation phase of e-Governance services can be faster. This model can also reduce the cost of e-Governance infrastructure in early phase.

Platform Model

The consumer control the application that run in the environment, does not control the operating, hardware or network infrastructure on which they are running. The platform is typically an application framework.

In the traditional model of e-Governance the departments have to wait for purchasing the software. Now in this model if some government department requiring resources for Operating system for new Data Base software they can request and get resources instantly Some of the working platforms are

- Dynamic Operating System
- Dynamic Query Services
- Dynamic Database Software Services
- On Demand Workflow Services

Infrastructure

The consumer uses fundamental computing resources such as processing power, storage and networking components. The consumer can control the Operating System, storage, deployed applications and possibly networking components such as firewalls and load balancers, but not the cloud infrastructure.

FOUR DEPLOYMENT MODEL

Public Cloud

The Public cloud services are characterized as being available to clients to third party services via Internet. The term Public does not mean always free, it mean it can be free or inexpensive to use. A public cloud does not mean that a user data is publically visible; public cloud vender typically provide an access control mechanism for their user[4].

Private Cloud: A private cloud offer many of the benefits of a **public cloud** computing environment. The difference between a private cloud and public cloud is that in a private cloud based service, data and processes are managed with in the organization without the restriction of network bandwidth, security exposure and legal requirements that using public

cloud services. In addition the public cloud service offer the provider and the user control of the cloud infrastructure, improving security and facilities because the user access and the network used are restricted and designated.

Community Cloud: A community cloud is controlled and used by a group of organization that have shared interests, such a specific security requirement and a common mission, The member of community share access to data and application in the cloud.

Hybrid Cloud: A Hybrid cloud is a combination of a public and private cloud that interoperates. In this model user typically outsource non business- critical information and processing to the public cloud [6].

Cloud Computing Benefits in e-Governance

Data Scaling

Challenge

The databases should be scalable, to deal with large data over the years for E-Governance applications. Where relational databases ensure the integrity of data at the lowest level, cloud databases could be scaled and can be used for such type of applications. Cloud databases available for deployment offer unprecedented level of scaling without compromising on the performance.

Cloud Benefits

Cloud databases must be considered if the foremost concern is on-demand, high-end scalability – that is, large scale, distributed scalability, the kind that can't be achieved simply by scaling up.

Auditing and Logging

Challenge

Traceability to any changes to information content in E-Governance services is required. Corruption in government organizations can be controlled by using Information Technology services, by keeping the providers of the services accountable. Process audits, security audits must be done periodically to ensure the security of the system.

Cloud Benefits

Cloud can help in analyzing huge volumes of data and detecting any fraud. It can help in building and placing defence mechanisms to enhance the security, thereby making the applications reliable and available. Rolling out New Instances, Replication, Migration Disaster Recovery Performance and Scalability Reporting and Intelligence for Governance Enforcing and Managing Policies Centrally Systems & Legacy Application Integration Obsolete Technologies and Migration .Support for 'Go-Green' Initiatives

Rolling out new Instances, Replication and Migration

Challenge

Traditionally, applications in E-Governance work for department states and municipalities and hence take more time, effort, resources and budget. This happens for all the instances of these applications. Capabilities must exist to replicate these to include another municipality or e-court as part of e-Governance.

Cloud Benefits

Cloud architectures offer excellent features to create an instance of application for rolling out a new municipality. Cloud can reduce the time to deploy new application instances.

Disaster Recovery

Challenge

Natural disasters like floods, earthquakes, wars and internal disturbances could cause the E-Governance applications not only loose data, but also make services unavailable. Multiple installations in geographically separated locations with complete backup and recovery solutions must exist. This could create huge problems. Disaster recovery procedures must be in place and practiced from time to time. Applications and data must be redundant and should be available on a short notice to switch from one data centre to centre.

Cloud Benefits

Cloud virtualization technologies allow backups and restoring. It offers application migration seamlessly compared to traditional data center.

CONCLUSION

In India most of the states are willing to adopt the e-Governance model to offer government services online upto last level, some major barriers are unavailability of required infrastructure, unavailability of e-Governance application, unavailability of trained work force in IT and unavailability of required funds.. The future of cloud computing has to be visible more in coming years and we will learn lesson about the drawback of cloud computing like security of data after some time.

REFERENCES

- [1] Grossman, R. L.The case of cloud computing, IEEE-2009.
- [2] Maria, A.F., Fenu, G., and Surcis, S. An Approach to Cloud Computing Network, IEEE-2008.
- [3] Youseff, L., Butrico, M., and DaSilva, D. Towards a Unified Ontologyof Cloud Computing. Grid Computing Environment Workshop 2008, GCE08'.
- [4] Pant Durgesh, Sharma M. K. , "Cloud Computing " , CSI Communication-2009, pp10-13,Vol 32, Issue 10.
- [5] Heek, R. Implementing and Managing e-Government, Vistaar Publication, 2006.
- [6] Armburst, M. et al.,Above the clouds: A Berkeley View of Cloud Computing, Technical ReportNo. UCB/EECS-2009-28., Accessed at: <http://www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.html>, Feb, 2009.

Routing Protocol and Security Issues for VANET (Vehicular Ad-Hoc Network): A Survey

Monika Singh¹, R.K. Singh² and Shruti Saxena³

¹Student, KNIT, Sultanpur

²Associate Prof, KNIT, Sultanpur

³Student, KNIT, Sultanpur

Abstract—Vehicular ad-Hoc Network (VANET) is an emerging field of research due to wide variety of services (that includes safety, crash avoidance and user application) it offers to the users. VANET are special class of MANET (Mobile Ad-Hoc Network) which consist of vehicles and road side unite(RSU)that supports the management of the network and provide efficient communication between the vehicles(V-2V)and between vehicles and RSU(V-2-R).This paper is a survey of different routing algorithms and related projects for VANET. This paper also discusses the various security issues.

Keywords: VANET, Routing, GPS

INTRODUCTION

Road safety has always been the subject of intense interest of research community and automobile industry. Around the world millions people die every year in road accidents and many more are injured. As more and more vehicles are adding to the road, demand for new concepts and equipments that can help to make travel on roads convenient and safe has increased a lot. Smart vehicles with the appropriate wireless On Board Units (OBU) will in the near future be able to communicate with each other as well as road side units (RSUs) located at key points on the road such as junctions. This enables the formation of self-organized networks containing the vehicles and RSUs so that it can collect and distribute safety information to massively reduce the number of accidents by warning the drivers about the danger before they actually face it.

Thus here nodes are completely mobile and it includes communication between vehicles (V2V) or between vehicle and road side unit (V2R). This paper provides a survey of the various routing strategies defined for VANET together with the various security issues and its wide range of application. Section II discussed different routing strategies. Safety issues and safety requirements are presented in Section III and Section IV respectively. Finally we conclude the paper in Section V.

ROUTING STRATEGIES

Routing protocols for VANET are classified into following categories:

Topology based Forwarding

Classical routing approaches for ad hoc networks are topology-based. It means that routing decisions are taken based on existing links among network nodes. OLSR [2], DSR [3], AODV [4] or DSDV [5] are some good examples. OLSR and DSDV are proactive whereas AODV and DSR are reactive in nature . In [1] the performance analysis of AODV, DSR, and DSDV shows that they suffer from highly dynamic nature of node mobility and thus they are not suitable for VANET.

Position based Routing Protocols

Position-based routing strategies usually assume every vehicle has an on board GPS (global positioning system) for routing and broadcasting. These routing protocols make use of position information obtained from GPS regarding destination and next hop neighbor. For example, greedy routing always forwards the packet to the node that is geographically closest to the destination. Two special cases must be handled with greedy forwarding: there might be more than one suitable next hop or there might be no suitable neighbor (local minimum).

GPSR (Greedy Perimeter stateless routing) [9] is one of the best position based protocol which combines the greedy routing with face routing to get out of the local minimum problem (no neighbor node exist which is closer to the destination than the intermediate node itself), [10] shows the simulation result of GPSR as compared to DSR and it is found that GPSR results better in highway because there are few obstacles as compared to city environment. However when GPSR is applied to the city scenario for VANET [10]-[12] To improve the performance of GPSR, GPSR with life time (GPSR-L) [13] was proposed which improves the performance by selecting the next neighbor node with good quality link and non-zero lifetime. Greedy Perimeter Coordinator Routing(GPCR) [15] without the availability of digital map further improves the GPSR .Since actual routing decision are required at the junction, so GPCR uses the node at the junction (called coordinator) to decide which street the packet should follow to reach the next hop and finally to the destination. GPCR outperforms GSR by its repair strategy to get out of the local minimum. The repair strategy (1) uses

the right hand rule on each junction to decide which street the packet should follow (by right hand rule it chooses the street that is the next one counter clockwise from the street the packet has arrived on) (2) between the junction greedy routing is applied to reach the next one. Lochert et al [14] proposed Geographic Source Routing(GSR) which combines together topological knowledge and position based routing for routing decision .GSR assumes that vehicle are equipped with on board GPS that provide digital map of the city and uses Reactive Location Service(RLS) to get correct destination position. GSR makes use of Dijkstra's shortest path algorithm to determine the sequence of junction the packet has to traverse to reach the destination provided with the underlying street map. The simulation results demonstrate that GSR outperforms AODV and DSR with respect to bandwidth consumption, average delivery rate and latency.A-star (Anchor-based Street and Traffic Aware Routing) [16] is a new position based forwarding technique which solves the broadcast storm problem caused by RLS flooding packet. A-star make use of city bus route information and a street with higher bus route is given less weight It computes the anchors (junction) with traffic awareness using the street map and an anchor path with higher connectivity is selected for packet delivery .The author proposes the use of dynamic map to get the latest route information for a better route selection scheme. GyTAR (Greedy Traffic Aware Routing) [17] algorithm has been proposed to target the city problems. Neither GSR nor even A-STAR considers the changing traffic environment, vehicle direction, velocity, multi-directional roads. All of these factors affect VANET routing, and GyTAR includes them into its routing strategy. It calculate the best route that packet should take from the intersection to reach its destination with the help of map and traffic density information. The calculation is based on the real time traffic information such as vehicle's direction, speed, distance to the destination, number of car within that distance and last known position. Effects of falsified position on routing are shown in [6] [7].As a solution to this various position verification approaches are discussed in [8]

Broadcast Routing Protocols

The best way of propagating the safety information (such as weather, emergency, traffic and road condition) is to broadcast it to warn the driver about the potential dangerous situation. When there is a need to send the related information into larger network the multihop broadcasting is also essential. Flooding is the simplest and most prominent technique for broadcasting. It performs well for a small size network but the performance decreases as the network's size increases. However blind forwarding would result into broadcast storm problems.

Cell reflector sometimes behaves as a base station (cluster head) for handling the emergency messages coming from the same cell or from neighboring cell reflectors. This protocol outperforms similar flooding based routing protocol in the message broadcasting delay and routing overhead.UMB (Urban Multi-Hop Broadcast protocol[19]) is designed for multihop broadcast in urban scenario and addressed the packet collision and hidden node problem. In UMB roads are divided into segments such that each segment consist of only one vehicle and sender node select the furthest nonempty segment in the broadcast direction without a priori network topology information. However the usage of omnidirectional antenna results in several drawbacks. V-TRADE (Vector-based Tracking Detection) and History-enhanced V-TRADE (HV-TRADE) [20] are GPS based message broadcasting protocols and their basic idea is similar to the Zone Routing Protocol (ZRP) [21]. Peiyuan et.al [22] proposed the RB-MP reliable broadcast routing protocol based on mobility prediction. In RB-MP only few nodes are selected for re-broadcasting the information and the selection is on the basis of Prediction Holding Time (PHT) of the connection between two nodes. The PHT indicates connection time during which one node may stay in transmission range of the other without going ahead of it. Simulation results from [22] have proved that RB-MP outperformed Flooding, V-TRADE and UMB in terms of packet delay under highly mobile scenarios.

Cluster based Routing

Cluster based routing performs clustering of nodes to form a virtual network infrastructure to achieve scalability. Each cluster have exactly one cluster head which performs the intra and inter cluster coordination functions. The creation of network infrastructure is crucial due to the dynamic nature of VANET. Many cluster based protocols have been studied for MANET[27][31][32]. However VANET behaves differently than the MANET due to the constrained on mobility, higher speed etc. Thus the cluster based routing for VANET should take into account its fast changing nature, delays and overhead involved in creating cluster as VANET requires faster response.

LORA_CBF [30] uses cluster based flooding for VANET and it is a reactive location based routing algorithm. Each node can act as cluster-head, cluster member or gateway .Each cluster can have exactly one cluster-head and maintains information about its member and gateways. When the performance of AODV, LORA_CBF and DSR are compared in urban and highway scenario, result shows that network mobility and size affect the performance of AODV and DSR more significantly than the LORA_CBF. Blum et. al. [28] proposed COIN (Clustering for Open IVC Networks) algorithm. Unlike the classic clustering methods in COIN election of cluster head is based on vehicular dynamics and driver intentions. This algorithm also accommodates the oscillatory nature of inter-vehicle distances. They show that COIN produces much more stable structures in VANETs while introducing little additional overhead.

SECURITY ISSUES

In case of VANETs, securing forwarding and dissemination is a critical issue. The adversary to the security could be any one inside or outside the network, nasty or rational, and active or passive and the various kind of attacks[24][25] that VANET faces are categorized as:

General Attacks

General attacks [23] are those which happen to both topology based and position-based forwarding solutions it includes:

Denial of Service (DoS)

DoS attack aims to bring down the VANET through methods such as channel jamming, exhausted by consuming the Node Resources

Black hole

A black hole is formed when nodes refuse to participate in the network or when an established node drops out. In this type of attacks, all network traffics are redirected to a specific node, which does not exist at all that cause those data to be lost.

Bogus Information Attack

In this type of attack, attackers diffuse false information to misguide other vehicles.

General attacks except DoS attack could usually be prevented or detected by authentication. To ensure authentication, certificate authorities could be used. Various CA based security schemes are discussed in [29].

Position Based Attacks

Depending on the position information network is susceptible to following attack.

Location falsification

A node can claim a faked position to pretend to be optimal than other candidates to aggregate all data as a black hole. The secure location schemes are discussed in [26]

Position Spoofing Attack

Position-based routing protocols are prone to various attacks.

Malicious vehicles can intentionally lie about their positions and by manipulating its own position information; a malicious vehicle can be selected as an intermediate relay node. It can then either drop the data packets or modify the content of the packets, solution are discussed in [25]

Sybil Attack

Here a node sends multiple messages to other nodes and each message contains a different fabricated source identity in such a way that the originator is not known. It is found that the use of bi-directional antenna could help to detect Sybil attack.

Masquerading

The attacker actively pretends to be another vehicle by using false identities and can be motivated by malicious or rational objectives. Message fabrication, alteration, and replay can also be used towards masquerading.

SECURITY REQUIREMENT

The security of VANETs is most critical issues, It is necessary that all transmitted data cannot be injected or changed by users who have malicious goals. Moreover, the system must be able to detect the malicious behavior of drivers while still maintaining their privacy [23] [24]. Thus the solution should satisfy the following goals [4]

1. Authentication
2. Privacy
3. Confidentiality
4. Data integrity
5. Availability
6. Non repudiation

CONCLUSION

In this paper, we made a survey of routing protocols and security issues for VANETs and looked at studies that were performed in this area. Every routing protocol have its own pros and cons. Cluster based protocol may provide scalability but it lacks in the case of faster response. Since the topology of the network changes frequently, the overhead involved in creating the cluster may slow down the speed of the protocol. The future challenge in VANET is to design a global solution that works well for all kind of VANET applications.

K-Means Clustering Algorithm

1. Input: a database D , of m records r_1, \dots, r_m and a desired number of clusters. k
2. Output: set of k clusters
3. Begin
 - a. Randomly choose k records as the centroids for the k clusters'
 - b. Repeat
4. Assign each record, r_i , to a cluster such that the distance between r_i and the cluster centroid (mean) is the Smallest among the k clusters;
5. Recalculate the centroid (mean) for each cluster based on the records assigned to the cluster;
6. Until no change;
7. End

CONCLUSION

Data Mining (DM) is considered to be an important step in the process of knowledge discovery that emphasizes the cleaning, warehousing, and mining of knowledge in data bases. It is a form of artificial intelligence that uses automated processes to find information. Although its use in libraries is limited, data mining has been used successfully for several years in the scientific, medical and business communities for tracking behavior of individuals and groups, processing medical information and number of other applications.

Clustering can be considered the most important unsupervised learning technique; so, as every other problem of this kind, it deals with finding a structure in a collection of unlabeled data.

Clustering is "the process of organizing objects into groups whose members are similar in some way".

A cluster is therefore a collection of objects which are "similar" between them and are "dissimilar" to the objects belonging to other clusters.

- Very useful in data mining
- Applicable for both text and graphical based data
- Help simplify data complexity
- Classification
- Detect hidden pattern in data

REFERENCES

- [1] Adhman Bouguettaya, (1996), "On Line Clustering," IEEE Transaction on Knowledge and Data Engineering Volume 8, No. 2, April.
- [2] Euripides G.M., Petrakis and Christos Faloutsos, (1997), "Similarity Searching in Medical Image Databases", IEEE Transaction on Knowledge and Data Engineering Volume 9, No. 3, May/June.
- [3] Fayyad, Usama; Gregory Piatetsky-Shapiro, and Padhraic Smyth, (1996), "From Data Mining to Knowledge Discovery in Databases". Retrieved 2008-12-17.
- [4] Short, Rob, Gamache, Rod, John Vert and Mike Massa, "Windows NT Clusters for Availability and Scalability," Microsoft Online Research Papers, Microsoft Corporation.
- [5] Jim Gray, "QqJim Gray's NT Clusters Research Agenda," Microsoft Online Research Papers, Microsoft Corporation.
- [6] Moxon, Bruce, (1996), "Defining Data Mining, The Hows and Whys of Data Mining, and How It Differs From Other Analytical Techniques," Online Addition of DBMS Data Warehouse Supplement, August.
- [7] Willet, Peter, (1990), "Parallel Database Processing, Text Retrieval and Cluster Analyses," London: Pitman Publishing.

REFERENCES

- [1] X. Wei, L. Qing-Quan, Performance Evaluation of Data Disseminations for Vehicular Ad hoc Network in highway scenarios, <http://www.ispns.org/congresses/proceedings/1pdf/174.pdf>.
- [2] T. Clausen and P. Jacquet, "Optimized Link State Routing Protocol (OLSR)", in RFC 3626, IETF Network Working Group, October 2003.
- [3] JOHNSON, D. B., MALTZ, D. A., "Dynamic Source Routing in Ad-Hoc Wireless Networks", in Mobile Computing, 1996.
- [4] C. E. Perkins and E. M. Royer, "Ad Hoc On-Demand Distance Vector Protocol", in C. E. PERKINS (Ed), Ad Hoc Networking, pp. 173-219, Addison-Wesley, 2000.
- [5] C. E. Perkins and P. Bhagwat, "Highly Dynamic Destination-Sequenced Distance-Vector Routing (DSDV) for Mobile Computers", in SIGCOMM '94: Computer Communications Review, 24(4), 234-244, October 1994.
- [6] T. Leinmüller et al., "Influence of Falsified Position Data on Geographic Ad-Hoc Routing," Proc. 2nd European Wksp. Security and Privacy in Ad hoc and Sensor Networks (ESAS 2005), July 2005.
- [7] T. Leinmüller and E. Schoch, "Greedy Routing in Highway Scenarios: The Impact of Position Faking Nodes," Proc. Wksp. Intelligent Transportation (WIT 2006), Mar. 2006.
- [8] T. Leinmüller et al "POSITION VERIFICATION APPROACHES FOR VEHICULAR AD HOC NETWORKS".
- [9] B. Karp and H.T. Kung, "GPSR: Greedy perimeter stateless routing for wireless networks," in Proceedings of the ACM/IEEE International Conference on Mobile Computing and Networking (MobiCom), 2000.
- [10] H. Fülller, M. Mauve, H. Hartenstein, M. Kasemann, and D. Voilmer, "Location based routing for vehicular ad-hoc networks," ACM SIGMOBILE Mobile Computing and Communications Review (MC2R), vol. 7, no. 1, pp. 47-49, Jan. 2003.
- [11] G. Liu, B.-S. Lee, B.-C. Seet, C.H. Foh, K.J. Wong, and K.-K. Lee, "A routing strategy for metropolis vehicular communications," in International Conference on Information Networking (ICOIN), pp. 134-143, 2004.
- [12] C. Lochert, H. Hartenstein, J. Tian, D. Herrmann, H. Fülller, and M. Mauve, "A routing strategy for vehicular ad hoc networks in city environments," in Proceedings of IEEE Intelligent Vehicles Symposium (IV2003), pp. 156-161, June 2003.
- [13] S. A. Rao, et al., "GPSR-L: Greedy perimeter stateless routing with lifetime for VANETS," in Proc. 8th Int. Conf. on ITS Telecommun., 2008, pp. 299-304.
- [14] C. Lochert, et al., "A routing strategy for vehicular ad hoc networks in city environments," in Proc. IEEE Intell. Vehicles Symposium, 2003, pp. 156-161.
- [15] C. Lochert, et al. "Geographic routing in city scenarios," ACM SIGMOBILE Mobile Computing and Communications Review (MC2R) vol. 9, no. 1, pp. 69-72, Jan. 2005.
- [16] G. Liu, B.-S. Lee, B.-C. Seet, C.H. Foh, K.J. Wong, and K.-K. Lee, "A routing strategy for metropolis vehicular communications," in International Conference on Information Networking (ICOIN), pp. 134-143, 2004.
- [17] M. Jerbi, S.M. Senouci, and Y. Ghamri-Doudane, "Towards Efficient Routing in Vehicular Ad Hoc Networks," in UBIROADS 2007 workshop, GHS Marrakech, Morocco; IEEE, July 2007.
- [18] M. Dursesi, A. Dursesi, L. Barolli, Emergency Broadcast Protocol for Inter-vehicle Communications, Proc. of 11th International Conference on Parallel and Distributed Systems (ICDAPS-2005), Vol. 2, pp. 402-406, 2005.
- [19] G. Korkmaz, E. Ekici, F. Özgüner, and Ü. Özgüner, "Urban multi-hop broadcast protocol for inter-vehicle communication systems," in ACM International Workshop on Vehicular Ad Hoc Networks, pp. 76-85, 2004.
- [20] M. Sun, W. Feng, T.-H. Lai, K. Yamada, H. Okada, and K. Fujimura, "GPS-based message broadcasting for inter-vehicle communication," in ICPP '00: Proceedings of the 2000 International Conference on Parallel Processing, 2000.
- [21] Z.J. Haas and M.R. Pearlman, "The zone routing protocol (ZRP) for ad hoc networks," in Internet draft—Mobile Ad hoc Networking (MANET), Working Group of the Internet Engineering Task Force (IETF), Nov. 1997.
- [22] L. Peliyan, et al., "A reliable broadcast routing scheme based on mobility prediction for VANET," in Proc. IEEE Intell. Vehicles Symposium, 2009, pp. 1083-1087.
- [23] M. Raya and J. Hubaux, "The Security of Vehicular Ad Hoc Networks" presented at the 3rd ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN 2005), Alexandria, 2005.
- [24] Farzad Sabahi "The Security of Vehicular Adhoc Networks" 2011 Third International Conference on Computational Intelligence, Communication Systems and Networks.
- [25] Deepa et al "position verification in multihop network" 2009 Fifth International Conference on Information Assurance and Security.
- [26] Joo-Hang Song et al "Secure Location Verification for Vehicular Ad-Hoc Networks".
- [27] Ghassan et al "Security Issues and Challenges of Vehicular Ad Hoc Networks (VANET)".
- [28] Wu and H. Li, "A dominating-set-based routing scheme in ad hoc wireless networks," the special issue on Wireless Networks in the Telecommunication Systems Journal, vol. 3, pp. 63-84, 2001.
- [29] M Raya, P Papadimitratos, JP Hubaux, "Securing Vehicular Communications", IEEE Wireless Communications, Vol. 13, October 2006.
- [30] R.A. Santos, A. Edwards, R. Edwards, and L. Seed, "Performance evaluation of routing protocols in vehicular adhoc networks," The International Journal of Ad Hoc and Ubiquitous Computing, vol. 1, no. 1/2, pp. 80-91, 2005.
- [31] C.R. Lin and M. Gerla, "Adaptive clustering for mobile wireless networks," IEEE Journal of Selected Areas in Communications, vol. 15, no. 7, pp. 1265-1275, 1997.
- [32] B. Das and V. Bharghavan, "Routing in ad-hoc networks using minimum connected dominating sets," in 1997 IEEE International Conference on Communications (ICC'97), vol. 1, pp. 376-380, 1997.

Insight into PDF Workflows for Print Production

Priyank Singhal

Research Scholar (Computers) and Sr. Lecturer, CMCA, TMU

Abstract—A workflow consists of a sequence of connected steps. It is a depiction of a sequence of operations, declared as work of a person, a group of persons, an organization of staff, or one or more simple or complex mechanisms. For control purposes, workflow may be a view on real work under a chosen aspect, thus serving as a virtual representation of actual work. The flow being described often refers to document that is being transferred from one step to another. Workflow applications are software systems exist to support workflows in particular domains.

Referring to Print Production, the emergence of new Workflow technologies has brought new trends that are responsible for changing the printing industry. More specifically, PDF (Portable Document Format) workflows have brought about revolution in the field of Print Production. The following paper discusses the role of PDF workflows for print production.

Keywords: Workflow, Workflow Technology, PDF Workflow, Print Production

INTRODUCTION

Workflow is often seen as a key integration technology, bringing together business processes with the information to support them, and linking legacy and desktop applications into a flexible and adaptable distributed infrastructure. These systems are based on the notion that once the business process is defined, its automation simply requires the integration of a few simple tools.

According to the Workflow Management Coalition, workflow represents “the automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules”.

A key motivation for the deployment of workflow technology is that it should provide flexibility for the business process to evolve with minimum re-engineering. Workflow technology typically achieves this by enforcing separation between:

- the definition of the various activities within the business process and their data requirements
- the business rules governing the flow of control between activities within the process
- the roles and responsibilities associated with the work undertaken within the process activities
- an underlying organizational model, which relates roles and responsibilities to the actual work performers

WORKFLOW AND INTEGRATING SOFTWARE

A major aspect of many workflow systems is that they incorporate an organizational model, enabling workflow procedures to be defined relative to organizational roles and responsibilities. These may be separately maintained. Workflow systems may also require integration with process definition and modeling tools so that a proposed system can be fully specified and simulated prior to introduction.

Therefore, integration with the underlying infrastructure (Email, Object Request Broker domains, etc) is an additional requirement. **Figure 1** indicates some of the potential components and points of integration of a typical workflow system.

THE SYSTEMS INTEGRATION MODEL

The WfMC is the principal organization defining standards for workflow. The standardization programme is based upon the “Reference Model” shown in **Figure 2**

Here, five “interfaces” are identified within the Reference Model, realized by a combination of APIs, protocol and format conventions.

PRINTING—THE CURRENT SCENARIO

The introduction of the computer to the workflow has changed ‘Printing’ drastically. It introduced powerful design tools into the hands of more people, speed the process of preparing jobs for print, and provided cheap options for creating the final, printed piece. However, competition among those people creating for print and those who produce the printed material increases as more people become able to provide cheaper, faster, and better service. We can stay ahead in print by creating a workflow that pulls up the advantage of a digital workflow while avoiding the pitfalls.

TIME AND MONEY ARE IMPORTANT FACTORS

The introduction and use of digital prepress in the mid-eighties made a promise that it saves money and time when compared with traditional methods of publishing. However, the real picture was the reverse. As digital, creative tools become easier to use, more people are building files intended for professional-level printing. But, designers and printers approach the process from different perspectives and have different goals. These differences cause miscommunication in the delivery of work, which results in significant losses of both money and time.

For example, errors/mistakes in the delivery of a project may cease it completely as of reasons below:

- Missing linked graphic and/or text elements
- Missing font files used in the layout or in a graphic
- Page size information is unknown
- Unsupported native application files
- Further, mistakes in the project may not come to ground until the job is imaged:
- Low-resolution pixel-based graphics
- Color modes are not correct
- Hidden problems in linked graphic files
- Unintended spot colors that require additional printing plates
- Overprinting errors

Above problems require some sort of intervention. These problems have to be diagnosed and corrected which adds an unplanned expense to the job. If the creative professional has to do it, then the lost time may cause the job to miss a deadline. In either case, a customer becomes more likely to look for another vendor. Since maintaining existing customers is far less expensive than developing new ones, this is a bad situation.

A PDF WORKFLOW

A PDF workflow allows the standardization required to take full advantage of a digital workflow for print. PDF is uniquely suited to the task of collecting the many pieces of a print project, delivering those pieces, and acting as a vehicle for creating the final printed work.

PRINT INDUSTRY STANDARD—ADOBE PDF

Adobe introduced Adobe PostScript®, a revolutionary, device-independent page description language that would soon become the industry standard for printing rich text and graphical content. Later in early nineties, it introduced Adobe Acrobat and the Portable Document Format (PDF). Founded on shared concepts and components, both PostScript and Acrobat supported the creation of device-independent, rich page content; their only difference was the final output destination. PDF is now a well-known formal open standard known as ISO 32000. It will continue to be developed with the objective of protecting the integrity and longevity of PDF, providing an open standard for approximately one billion PDF files in existence today.

The professional print industry has appreciated the advantages of Adobe PDF. Well prepared client PDF files contained all the fonts and color space information, enabling printers to further automate their workflows and reduce the time and costs. It's because a PDF file can be validated for compliance with a set of specifications or standards, the file can move rapidly through the production process and get to press more quickly. PDF usage has gone up, and is expected to increase as more companies look to automate print processes and move to digital printing technologies.

A SIMPLE PDF WORKFLOW

The simple idea to implement an Adobe PDF workflow is to take advantage of the default presets that come with Acrobat 8 Professional and Adobe Creative Suite 2.3. When you create a PDF file, you can use one of the default Adobe PDF settings files (called PDF Presets in InDesign, Illustrator, and Photoshop) to apply the appropriate settings for one of several standard PDF workflows, including high-quality printing and press quality. In addition, you can use one of the default preflight profiles in Acrobat 8 Professional to check common sets of criteria before printing.

THE CREATIVE PROFESSIONAL'S ROLE IN A PDF WORKFLOW

It's important for the designer and the print service provider to communicate early in the process about final output, the inks used in the document, bleeds, trapping, and other job requirements in print workflow. In a print workflow that uses Adobe PDF files, the service provider should also provide the designer with the appropriate PDF settings file to use when creating the PDF file. The designer creates the file with the output requirements in mind and includes color management and transparency considerations. Then, the designer creates the PDF file, preflights it, and delivers the PDF file to the print service provider. Figure 3 shows PDF Workflow for the creative pro.

COLOR MANAGEMENT

A color management system maps colors from the color gamut of one device, such as a monitor, to a device with a different color gamut, such as a proofer or printing press. Hence, the colors on the monitor represent colors that the output device can reproduce. Color management profiles which describe the colors available to each device or color model are used to map colors from the range of colors available on one device into to the range available on another.

In Adobe Creative Suite applications (it's on by default) color management is kept enabled. Obtain a color management profile for the output device from your print service provider, and set that profile as your output or destination profile for good results. Using Adobe Bridge in Adobe Creative Suite 2.3, you can synchronize color management settings across all Adobe Creative Suite 2.3 applications. When you create the PDF file Embed the color management profile in the document.

TRANSPARENCY ISSUE

By setting its opacity to something other than 100% using any of the Transparency features Transparency can be applied directly to an object in Illustrator, InDesign, or Photoshop. For example, opacity, blending modes, drop shadows, feathering, live effects, styles, and brushes may result in live transparency. Transparency attributes are considered *live* as long as transparent objects can interact with objects beneath them and can be edited. Transparency must be flattened for export to most formats, or for printing to most printers.

Best is to keep transparency live (unflattened) as long as possible. To create a PDF with live transparency, export a PDF 1.4 (or later) file directly from an Adobe Creative Suite 2.3 application, such as InDesign CS2. Transparency remains live in the PDF file, and the print service provider can then flatten it as required.

If you're using transparency effects (for example, drop shadows or blending modes), consider the stacking order—the top-to-bottom order of objects on a page—because the order affects which objects are flattened. As possible, place text and line art elements above all nearby sources Adobe PDF in a Print Production Workflow of transparency to minimize the possibility that the flattener will process them. If possible, place such elements on their own layer, and make sure that layer is above all layers containing sources of transparency.

DESIGNING FOR A PDF/X FILE

Keep in mind the constraints imposed by the PDF/X standards, if you're planning to submit a PDF/X file. PDF/X presets ensure that most necessary conversions are performed when you create a PDF/X-compliant file. However, designing for PDF/X minimizes unexpected conversions.

However the PDF/X standard doesn't specify a minimum resolution for images, preflight the native application file to make sure the image resolutions meet your printer's specific requirements.

CREATING THE PDF FILE

While creating the PDF file, make sure all the fonts used in the document are available, and that links to image files are current. If you are using an application that includes a preflight feature, such as InDesign, use it to check the status of fonts, images, and inks in the document. In applications, such as Illustrator, use preview features to verify that inks will overprint and separate as you expect. Then, you can save or export a PDF file from an Adobe application, or use the Adobe PDF printer to create the PDF file.

THE PRINT SERVICE PROVIDER'S ROLE IN A PDF WORKFLOW

When the customer provides an Adobe PDF file communication between the print service provider and customer is the key to successful printing. As the print service provider, you know what the requirements for the PDF file are. To help the creative professional, recommend the appropriate default settings file, or supply a custom PDF settings file for your customer to use to create the PDF file. Further, provide a preflight profile the customer can use to verify that the PDF file meets your requirements. After you receive the PDF file, preflight it, perform production tasks, and output the file. Refer to Figure 4.

PREFLIGHTING THE FILE

On receiving a PDF file from a customer, make sure that the file meets your printing requirements.

Based on the criteria in the preflight profile, the Preflight feature in Acrobat 8 Professional analyzes the file for any problems. You can preflight a single document or preflight multiple files automatically using a preflight droplet, a small application that runs a preflight profile you specify.

ADOBE PDF IN A PRINT PRODUCTION WORKFLOW

If the file is a PDF/X file, make sure that it is compliant with the appropriate version of PDF/X, that it was created for the correct characterized printing condition (such as SWOP), that the trim and bleed settings are appropriate for the job, and that image resolution is correct. Although verifying that the file meets the PDF/X standard eliminates many common file preparation errors, it does not eliminate them all.

APPLYING FIXUPS

Acrobat 8 allows you to fix a variety of problems with the *Fixup*. A *Fixup* is an automated correction built into the preflight profile, and is designed to correct common problems you suspect incoming PDF files may have. They are applied to the PDF as a part of the preflight process, and can be very useful when attempting to print a PDF file that is causing an error. However, be aware that fix-ups may not be able to solve every problem.

PREPARING THE PDF FILE FOR OUTPUT IN ADOBE ACROBAT 8 PROFESSIONAL

Different workflow steps are required for different jobs. Suppose, you may need to process the PDF file for page imposition, trapping, and other prepress tasks. However, there are steps that are common to most workflows, and there are best practices for working with transparency, color management, and other aspects of document preparation.

We have variety of print production features in Acrobat 8. You can convert colors to CMYK, flatten transparency, preview color separations, soft-proof the document, embed printer marks, and even define page boundary boxes.

CONVERTING COLORS TO CMYK

We can convert colors to CMYK for a single page or an entire document in Acrobat 8 Professional. It uses the source color spaces of objects in the document to determine what (if any) color conversion is required. It also manages the colors using embedded profiles, if they exist, or default color spaces. You can specify different conversion options for different color spaces and colorants.

TRANSPARENCY FLATTENING

Transparency may be applied to an object in an Adobe Creative Suite 2.3 application by reducing its opacity using the Transparency palette. But blending modes, drop shadows, feathering, live effects, styles, and brushes are also other sources of transparency. Transparency attributes are considered live as long as transparent objects can interact with objects beneath them, allowing those objects to show through the transparency.

Transparency information must be flattened for export to most formats, or for printing to PostScript desktop printers, PostScript Level 2 RIPs, and some PostScript 3 RIPs (or printing systems based on these RIPs). Therefore, most RIPs that accept native PDF 1.4 files can process live transparency from the Adobe PDF file.

You can flatten transparency at any time in Acrobat 8. However, Adobe recommends working with live transparency as long as possible. So, customers should provide files with live transparency so the printer can control resolution and flattening settings. Flatten transparency before printing only if your workflow requires it. Do perform any necessary color conversions before flattening the file.

After you flatten artwork, the transparency is no longer live, so you can't edit the transparency effect. In addition, some of the original objects may be transformed into less editable formats.

PREVIEW OF OUTPUT

One can preview color separations, check for incorrect colors and RGB images, view color warnings, alias or convert inks in the Ink Manager, and soft-proof documents using a color management profile in the Output Preview dialog box in Acrobat 8 Professional. Changes you make in the Ink Manager are reflected in the Print dialog box, so settings you use to preview the inks are used when you print.

PDF IN NETWORK-POWERED WORKFLOWS

PDF provides the unifying information architecture for networked print production. It plays many roles within a networked print production workflow. As a stable and predictable content vessel, PDF establishes clear hand-offs and boundaries between different layers and stages of the process. While not serving as the native format for e-commerce or communications programming, PDF conveys the results of these activities within value-adding stages of the graphic communications workflow. PDF is now fast becoming the basic unit of work for media production. Refer to Figure 5.

PDF experts confirm that PDF is already making valuable contributions. Its development is moving in the right direction. However, early experiences have also brought into relief some process issues that must be addressed if PDF is to fulfill its potential within a network-powered print workflow. Survey of 17 key issues evaluates PDF's current performance and identifies the gaps that remain. Refer to Figure 6.

CONCLUSION

A well-implemented PDF workflow is perhaps the single best thing you can do to enhance control and improve efficiency, reliability, and productivity in your print production workflow as a print service provider. Because it affects the complete print production process from design to final output, it has a greater impact than faster computers and adds more value throughout the print production process than any other hardware or software product. A PDF workflow is a

complete solution. The robust and powerful tools made available in Adobe Acrobat and in production solve problems that cost time and money while aiding communication and collaboration. A PDF workflow bridges the productivity gap between document creation and print production from document creation through to the final printed pages and even for repurposing documents onto the Internet.

On submitting the job as an Adobe PDF, the designer can then repurpose the same file for use with an alternate delivery vehicle such as the Internet. A print vendor accepting Adobe PDF files also has the confidence that the file is constructed to meet the requirements of a particular workflow. In either case, the time and cost of the job are dramatically reduced because entire steps are eliminated from the print process.

The gestation period for PDF in print production is over. Benefits across a full range of print applications are remarkable. Gaps in current PDF workflow solutions can be bridged and better solutions can be given. Variety of new developments that are going on will accelerate market acceptance.

It is best to say that PDF will grow rapidly in spite of any economic conditions with the creation, and implementation of proper Print Production Workflows.

FIGURES FOR REFERENCE

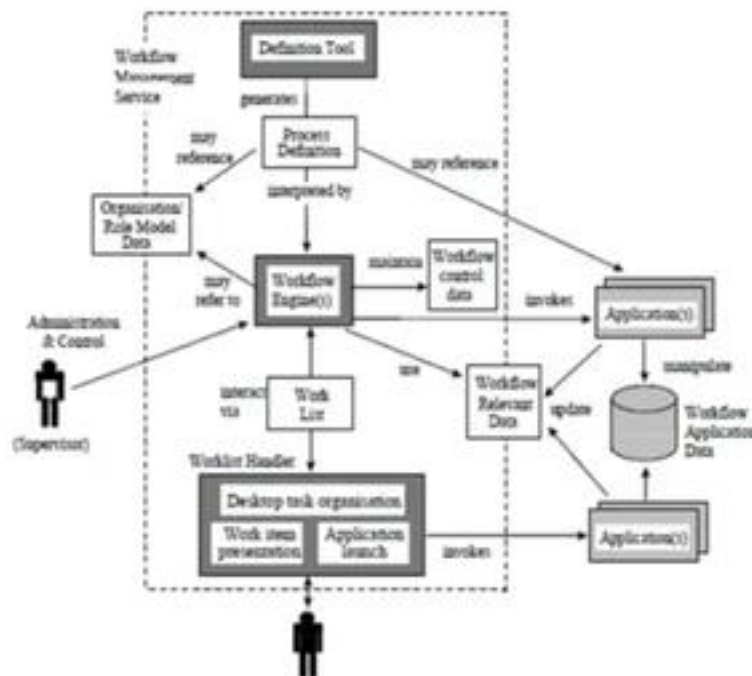


Fig. 1: Workflow Systems Component

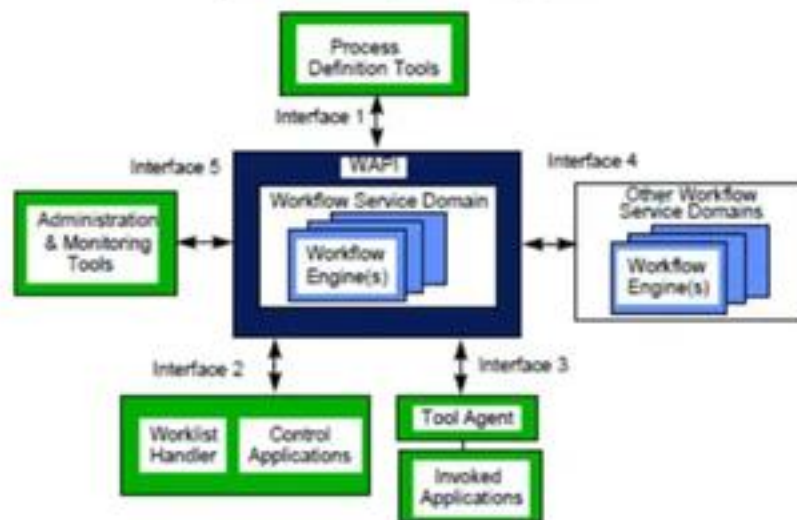


Fig. 2: The WfMC Reference Model



Fig. 3: PDF Workflow for the Creative Pro



Fig. 4: PDF Workflow for the Print Service Provider



Fig. 5: Network Powered Print Production Workflow

NO	ISSUE	REQUIREMENT	ASSESSMENT	RATING
1	E-commerce	The graphic industry needs well-articulated ways of transacting business information pertaining to content and media workflows.	<ul style="list-style-type: none"> • PDF can convey e-commerce metadata. • Application development lags. 	●
2	Job tickets	Digital job specifications must accompany content throughout the media production cycle.	<ul style="list-style-type: none"> • PDF and PUP are, have the capability. • Systems are not widely available. 	●
3	Color management	Color must be synchronized across the devices and displays in a distributed print workflow.	<ul style="list-style-type: none"> • PDF does not directly support ICC profiles and device-independent color. • Next generation of the standard will enable robust color management. 	●
4	Content origination	A common imaging model for assembling, placing and manipulating granular elements is needed to streamline content origination.	<ul style="list-style-type: none"> • No PDF authoring tools, flexibility is limited to a small number of applications. • Adobe's "X2" application may someday provide comprehensive PDF editing tools. 	●
5	Content Proofing	The creative process needs a compact, comprehensive proofing format with collaborative features.	<ul style="list-style-type: none"> • PDF is well suited for preliminary content proofing. • Some secondary issues must be resolved. 	○
6	Digital mastering	Efficiency in a dynamic workflow depends on digital masters that are comprehensive and consistent.	<ul style="list-style-type: none"> • PDFs can be reliable digital masters. • Distiller settings must be portable. A new COATS standard awaits approval. 	●
7	Preflighting	Content must be validated on both ends of a digital transaction.	<ul style="list-style-type: none"> • Dependent print criteria-driven content-checking of PDF files provide excellent validation of page-based content. • On screen inspection may also be required. 	○
8	Transmission	A distributed online workflow needs a content format that travels well through all pathways in a wide-area multiservice network.	<ul style="list-style-type: none"> • PDF is secure, compact and comprehensive. • It travels well over all networks. 	○
9	Process management	Dynamic print production needs self-declaring, modular content.	<ul style="list-style-type: none"> • PDF contains the prerequisite information infrastructure. • CIM systems are not widely available. 	●
10	Prep	Media production must be able to perform page assembly operations without disturbing unrelated elements.	<ul style="list-style-type: none"> • OPI and some assembly supported. • PDF's open architecture will enable dynamic assembly. 	●
11	Impose	The economic benefits of CTP and large format imaging depend on efficiency and flexibility in the creation/management of digital signatures.	<ul style="list-style-type: none"> • PDF's page independence and viewability make it a good building block for electronic imposition. • PDF-in / PDF-out imposition is needed. 	○
12	Late stage editing	Media production needs a stable page format that shields content from its processes, yet allows for late changes.	<ul style="list-style-type: none"> • Some tools are available, but it is not always practical. • High-end applications and Adobe's forthcoming "X2" may increase editability options. 	●
13	RIP	PDF-native RIP'ing is needed to pipeline imaging processes.	<ul style="list-style-type: none"> • Availability of for PDF-native RIP'ing is limited. • Needed: widespread deployment of PUP and Extreme workflow architectures. 	●
14	Trap	Trapping should take place where it makes the most sense in a given workflow.	<ul style="list-style-type: none"> • Lack of application support for vector-tagged composite PostScript is a problem. • PDF is a good input format for in-RIP or post-RIP rules based raster trapping. 	●
15	Contract proofing	Digital contract proofs, whether produced locally or remotely, must closely match the imaging characteristics of the final printed piece.	<ul style="list-style-type: none"> • PDF can provide reliable input for remote contract proofing. • Output devices must be synchronized. 	●
16	Printing & binding	Processes need to be orchestrated digitally within a single online environment.	<ul style="list-style-type: none"> • CIP3 has adopted PUP as its standard print production format. • The movement toward CIP3-compliant equipment is well underway. 	●
17	Archiving	Long term asset storage and management requires secure, robust, flexible formats.	<ul style="list-style-type: none"> • PDF is a good unit of storage for job-based content. 	○

Fig. 6: 17 Key Issues for PDF

REFERENCES

- [1] Glossary, 1996, The Workflow Reference Model, 1995, Workflow API Specification, 1995, Workflow Interoperability Specification, 1996, Process Definition Interchange Specification (draft), 1998.
- [2] David Hollingsworth, Principal Architect, Skill Centre, Windsor, UK "Workflow—A Model for Integration".
- [3] Technical paper, "Adobe PDF in a Print Production Workflow", Adobe Systems Incorporated, 345 Park Avenue, San Jose, CA 95110-2704 USA, 2008.
- [4] White Paper, "Adobe PDF Workflows for Print Production", Adobe Systems Incorporated, 345 Park Avenue, San Jose, CA 95110-2704 USA, 2001.
- [5] White Paper, "Saving time and money with PDF in print", Adobe Systems Incorporated, 345 Park Avenue, San Jose, CA 95110-2704 USA, 2003.
- [6] "Digital Roadmaps Special Report: PDF—Unifying Print & Interactive Media" by Mark Lewiecki, Senior Analyst for Digital Roadmaps

An Approach of Green Computing

Manish Joshi, Chanchal Chawla and Amit Gupta

Lecturer, CMCA (TMU)

Abstract—As we know that now-a-day technology is increasing like lightning in every field, industries are growing and so are the pollution and its ill effect, which has a great impact on our daily life. With this trend one more revolution has started taking place which is "green technology" focusing upon both aspects of growth and environmental protection and so far has been resulted far well enough. This article focuses especially on green computing world of technology which has targeted upon the objective of providing protection to environment and not to deplete the natural resources. This article discusses the green technologies like sugar powered batteries, solar computing, carbon free computing, Lead-Free and RoHS computing, Carbon-emissions, Energy-efficient computing, Energy Star Products and various other such products and the benefits that our environment will have and the effect of such technology in other countries.

Keywords: Environment, Carbon free computing, Lead-free computing, Solar computing, Carbon-emissions

INTRODUCTION

The field of "green technology" encompasses a broad range of subjects—from new energy-generation techniques to the study of advanced materials to be used in our daily life. Green technology focuses on reducing the environmental impact of industrial processes and innovative technologies caused by the Earth's growing population. It has taken upon itself the goal to provide society's needs in ways that do not damage or deplete natural resources. Mainly this means creating fully recyclable products, reducing pollution, proposing alternative technologies in various fields, and creating a center of economic activity around technologies that benefit the environment.

Perhaps the most talked about aspect of green technology is the promise of alternative energy sources. Sun, wind, water, sugar—we've heard about them all. However, scientists are working on other aspects of the problem as well, testing building materials and studying chemical processes to reduce the use and generation of hazardous substances. Nanotechnology is also being used in an attempt to manipulate materials at the nanometer scale; scientists are hoping it can transform manufacturing on a global level, from government purchasing to a technological revolution.

The huge amount of computing manufactured worldwide has a direct impact on environment issues, and scientists are conducting numerous studies in order to reduce the negative impact of computing technology on our natural resources. Companies are addressing e-waste by offering take-back recycling programs and other solutions, with lower energy consumption and less wasted hardware. A central point of research is testing and applying alternative nonhazardous materials in the products' manufacturing process.

VIA TECHNOLOGIES GREEN COMPUTING

VIA Technologies, a Taiwanese company that manufactures motherboard chipsets, CPUs, and other computer hardware, introduced its initiative for "green computing" in 2001. With this green vision, the company has been focusing on power efficiency throughout the design and manufacturing process of its products. Its environmentally friendly products are manufactured using a range of clean-computing strategies, and the company is striving to educate markets on the benefits of green computing for the sake of the environment, as well as productivity and overall user experience.

CARBON-FREE COMPUTING

One of the VIA Technologies' ideas is to reduce the "carbon footprint" of users—the amount of greenhouse gases produced, measured in units of carbon dioxide (CO₂). Greenhouse gases naturally blanket the Earth and are responsible for its more or less stable temperature. An increase in the concentration of the main greenhouse gases—carbon dioxide, methane, nitrous oxide, and fluorocarbons—is believed to be responsible for Earth's increasing temperature, which could lead to severe floods and droughts, rising sea levels, and other environmental effects, affecting both life and the world's economy. After the 1997 Kyoto Protocol for the United Nations Framework Convention on Climate Change, the world has finally taken the first step in reducing emissions. The emissions are mainly a result of fossil-fuel-burning power plants. (In the United States, such electricity generation is responsible for 38 percent of the country's carbon dioxide emissions.)

VIA aims to offer the world's first PC products certified carbon free, taking responsibility for the amounts of CO₂ they emit. The company works with environmental experts to calculate the electricity used by the device over its lifetime, generally three years. From this data, one can conclude how much carbon dioxide the device will emit into the atmosphere during its operation. This estimate will serve as an indicator, and the company will pay regional organizations for the "sequestering," or offsetting, of the emissions. Offsetting carbon dioxide can be achieved in different ways. One way is to plant trees that absorb CO₂ as they grow, in the region in which the processors were purchased. The necessary amount of trees per processor is represented by VIA's Tree Mark rating system.

In addition, VIA promotes the use of such alternative energy sources as solar power, so power plants wouldn't need to burn as much fossil fuels, reducing the amount of energy used. Wetlands also provide a great service in sequestering some of the carbon dioxide emitted into the atmosphere. Although they make up only 4 to 6 percent of the Earth's landmass, wetlands are capable of absorbing 20 to 25 percent of the atmospheric carbon dioxide. VIA is working closely with organizations responsible for preserving wetlands and other natural habitats, and others who support extensive recycling programs for ICT equipment. The amount paid to these organizations will be represented by a proportion of the carbon-free product's price.

Carbon-emissions control has been a key issue for many companies who have expressed a firm commitment to sustainability. Dell is a good example of a company with a green image, known for its free worldwide product-recycling program. Dell's Plant a Tree for Me project allows customers to offset their carbon emissions by paying an extra \$2 to \$4, depending on the product purchased. AMD, a global microprocessor manufacturer, is also working toward reducing energy consumption in its products, cutting back on hazardous waste and reducing its eco-impact. The company's use of silicon-on-insulator (SOI) technology in its manufacturing, and strained silicon capping films on transistors (known as "dual stress liner" technology), have contributed to reduced power consumption in its products.

SOLAR COMPUTING

Amid the international race toward alternative-energy sources, VIA is setting its eyes on the sun, and the company's Solar Computing initiative is a significant part of its green-computing projects. For that purpose VIA partnered with Motech Industries, one of the largest producers of solar cells worldwide. A solar cell fit VIA's power-efficient silicon, platform, and system technologies and enable the company to develop fully solar-powered devices that are nonpolluting, silent, and highly reliable. Solar cells require very little maintenance throughout their lifetime, and once initial installation costs are covered, they provide energy at virtually no cost. Worldwide production of solar cells has increased rapidly over the last few years; and as more governments begin to recognize the benefits of solar power, and the development of photovoltaic technologies goes on, costs are expected to continue to decline. As part of VIA's "pc-1" initiative, the company established the first-ever solar-powered cyber community center in the South Pacific, powered entirely by solar technology.

LEAD-FREE AND ROHS COMPUTING

In February 2003, the European Union adopted the Restriction of Hazardous Substances Directive (RoHS). The legislation restricts the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment. The directive is closely linked with the Waste Electrical and Electronic Equipment Directive (WEEE), which sets collection, recycling, and recovery targets for electrical goods and is part of a legislative initiative that aims to reduce the huge amounts of toxic e-waste. Driven by these directives, VIA implemented a set of internal regulations in order to develop products that are compliant with these accepted policies, including the use of nonhazardous materials in its production of chipsets, processors, and companion chips. In 2001, they focused on lead-free manufacturing, introducing the Enhanced Ball Grid Array (EBGA) package for power efficient VIA processors and the Heat Sink Ball Grid Array (HSBGA) package for their chipsets. In traditional manufacturing processes, lead is used to attach the silicon core to the inside of the package and to facilitate integration onto the motherboard through tiny solder balls on the underside of the package. VIA's lead-free manufacturing technologies do not require a lead bead, and the solder balls now consist of a tin, silver, and copper composite.

However, not everyone is satisfied with this new objective. Howard Johnson of the online *EDN* magazine says that the move toward lead-free devices is not only unhelpful but actually worse for the environment. "The additional tin mining required to produce high-purity tin alloys, plus the mining of other precious metals required to alloy with tin in substitution for lead, is a poor trade for the use of existing lead, much of which comes from recycled products," Johnson writes. He also believes that lead-free assembly is less reliable than lead-based assembly, partially due to the increased growth of tin whiskers—small, hair-like metallic growths that naturally emerge from the surface of solid tin. On lead-free tin surfaces, these whiskers can grow to a length sufficient to short an electronic circuit to another, leading to product failure.

ENERGY-EFFICIENT COMPUTING

A central goal of VIA's green-computing initiative is the development of energy-efficient platforms for low-power, small-form-factor (SFF) computing devices. In 2005, the company introduced the VIA C7-M and VIA C7 processors that have a maximum power consumption of 20W at 2.0GHz and an average power consumption of 1W. These energy-efficient processors produce over four times less carbon during their operation and can be efficiently embedded in solar-powered devices.

Governments Go Green

Many governments worldwide have initiated energy-management programs, such as Energy Star, an international standard for energy-efficient electronic equipment that was created by the United States Environmental Protection Agency in 1992 and has now been adopted by several other countries. Energy Star reduces the amount of energy consumed by a product by automatically switching it into "sleep" mode when not in use or reducing the amount of power used by a product when in "standby" mode. Surprisingly, standby "leaking" the electricity consumed by appliances when they are switched off, can represent as much as 12 percent of a typical household's electricity consumption. In Australia, standby power is a primary factor for the country's increased greenhouse gas emissions—more than 5 megatons (CO₂ equivalent) annually.

Test Case Effectiveness of Higher Order Mutation Testing

Shalini Kapoor
CSE Dept., GNI, Mullana

Abstract – Effectiveness means how good a test case is in finding faults. Traditional mutation testing considers First Order Mutants (FOM) created by injection of a single fault. We focus on Higher Order Mutants (HOM) and in particular on subsuming HOM. Higher Order Mutants contain more than one fault. We report in this paper that a strongly subsuming HOM is more effective as it kills all the FOM's from which it is constructed thereby reducing testing efforts without loss of effectiveness.

Keywords: Mutation Testing; First order mutants; Higher order mutants

INTRODUCTION

Mutants can be classified into two types: First Order Mutants (FOMs) and Higher Order Mutants (HOMs). FOMs are generated by applying mutation operators only once. HOMs are generated by applying mutation operators more than once. This paper introduces the concept of subsuming HOMs. A subsuming HOMs is harder to kill than the FOMs from which it is constructed. As such, it may be preferable to replace the FOMs with the single HOM. In particular, the paper introduces the concept of a strongly subsuming HOMs. A subsuming HOMs is only killed by a subset of the intersection of test cases that kill each FOM from which it is constructed.

Consider a subsuming, h , constructed from the FOMs $f_1 \dots f_n$. The set of test cases that kill h also kill each and every FOM $f_1 \dots f_n$. Therefore, h can replace all of the mutants $f_1 \dots f_n$ without loss of test effectiveness. The converse does not hold; there exist test sets that kill all FOMs $f_1 \dots f_n$ but which fail to kill h . The FOMs cannot, even taken collectively, replace the HOM without possible loss of test effort. This is the sense in which h can be said to 'strongly subsume' $f_1 \dots f_n$.

CLASSIFICATION OF HIGHER ORDER MUTANTS

HOMs can be classified in terms of the way that they are 'coupled' and 'subsuming', as shown in Figure 1. In Figure 1, the region area in the central Venn diagram represents the domain of all HOMs. The sub-diagrams surrounding the central region illustrate each category. For sake of simplicity of exposition these examples illustrate the second order mutant case; one that assumes that there are two FOMs f_1 and f_2 , and h denotes the HOM constructed from the FOMs f_1 and f_2 . The two regions depicted by each sub diagram represent the test sets containing all the test cases that kill FOMs f_1 and f_2 . The shaded area represents the test set that contains all test cases that kill HOM h . The areas of the regions indicate the proportion of the domain of HOMs for each category. Following the coupling effect hypothesis, if a test set that kills the FOMs also contains cases that kill the HOM, we shall say that the HOM is a 'coupled HOM', otherwise we shall say it is a 'de-coupled HOM'. Therefore, in Figure 1, the sub-diagram is a coupled HOM if it contains an area where the shaded region overlaps with the unshaded regions. For example the sub-diagrams (a), (b) and (f). Since the shaded region from sub-diagrams (c) and (d) do not overlap with the unshaded regions, (c) and (d) are de-coupled HOMs. Subdiagram (e) is a special case of a de-coupled HOM, because there is no test case that can kill the HOM; there is no overlap, the HOM is an equivalent mutant.

Subsuming HOMs, by definition, is harder to kill than their constituent FOMs. Therefore, in Figure 1, the subsuming HOMs can be represented as those where the shaded area is smaller than the area of the union of the two unshaded regions, such as sub-diagrams (a), (b) and (c). By contrast, (d), (e) and (f) are non-subsuming. Furthermore, the subsuming HOMs can be classified into strongly subsuming HOMs and weakly subsuming HOMs. By definition, if a test case kills a strongly subsuming HOM, it guarantees that its constituent FOMs are killed as well. Therefore, if the shaded region lies only inside the intersection of the two unshaded regions, it is a strongly subsuming HOM, depicted in (a), otherwise, it is a weakly subsuming HOM, depicted in (b) & (c).

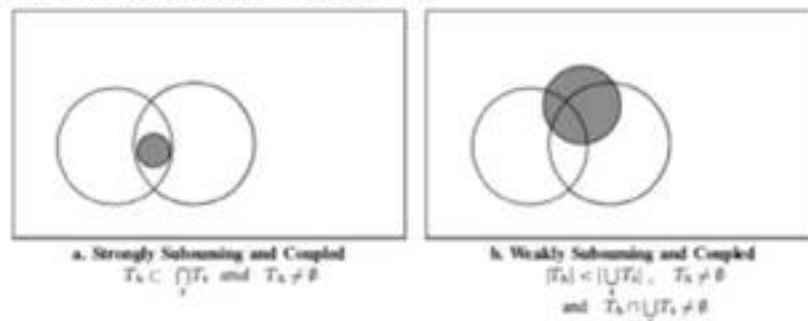


Fig. 1 (Contd.)...

Worldwide, standby power is estimated to account for as much as 1 percent of global greenhouse emissions. Most of the energy used by products on standby does not result in any useful function.

CECP is dedicated to encouraging manufacturers to produce more resource-efficient products and help consumers make more sustainable purchase decisions. CECP undertakes various projects within the national and the international arena, actively supporting improvements in energy efficiency and environmental protection and assisting social and economic sustainable development. In Japan, the Energy Conservation Center is responsible for raising public awareness on energy conservation, training and state examinations for energy managers, and their energy-conservation campaign and exhibition (ENEX).

On the Horizon

Green technology is gaining more and more public attention through the work of environmental organizations and government initiatives. VIA is one of the first corporations to concentrate on green computing that seems less a passing trend than a first step toward significant changes in technology. In May 2007, IBM unveiled its Project Big Green, dedicated to increasing energy efficiency across the company's branches around the world. Experts say that businesses will continue to invest in clean computing, not only because of future regulations, policies, and social demands to reduce their carbon footprint, but also due to the significant long-term savings it can make.

Several companies are already headfirst into the green-computing business. Located in the Silicon Valley and founded in 2006, Zonbu was the first company to introduce a completely environmentally responsible computer - Their "Zonbox" computer is a carbon-emission neutral computer, thanks to a low-power design and regulatory-grade carbon offsets. The device, which complies both with Energy Star standards and the Restriction of Hazardous Substances Directive (RoHS), consumes only 15W, compared to the 175W consumed by a typical desktop PC. Zonbu also provides a free take-back program to minimize environmental e-waste.

Another American company, Everex, has released the Impact GC3502, a green PC that uses 20W of power, owing to a 1.5GHz VIA C7-D processor.

VIA: VISION THROUGH THE PC-1 INITIATIVE

VIA isn't focusing only on the technological aspects of its eco-friendly devices, it's also taking a look at their applications. The VIA pc-1 initiative seeks to enable the next 1 billion people to get connected, by providing wider access to computing and communications technologies. The company is concentrating on empowering new, emerging markets, looking at models that reach beyond individual ownership of a PC, such as local pay-for-use facilities. Products built for such a use are characterized by ultra-efficient energy consumption and the ability to withstand heat and dust in harsh environments.

CONCLUSION

So green computing is a mindset that asks how we can satisfy the growing demand for network computing without putting such pressure on the environment. There is an alternative way to design a processor and a system such that we don't increase demands on the environment, but still provide an increased amount of processing capability to customers to satisfy their business needs. Green computing is not about going out and designing biodegradable packaging for products. Now the time came to think about the efficiently use of computers and the resources which are non renewable. It opens a new window for the new entrepreneur for harvesting with E-waste material and scrap computers.

REFERENCES

- [1] <<http://www.csi-india.org/green-computing>>
- [2] Marty Poniatowski. *Foundation of Green IT: Consolidation, Virtualization, Efficiency, and ROI in the Data Center*. Prentice Hall, August, 2009, ISBN-13: 978-0137043750.
- [3] John Lamb. *The Greening of IT: How Companies Can Make a Difference for the Environment?* IBM Press; May, 2009, ISBN-13: 978-0137150830.
- [4] Toby Velte, Anthony Velte, and Robert Elsenpeter. *Green IT: Reduce Your Information System's Environmental Impact While Adding to the Bottom Line*, McGraw-Hill Osborne Media; September, 2008, ISBN-13: 978-0071599238.
- [5] Bhuvan Unhelkar. *Green IT Strategies and Applications: Using Environmental Intelligence*. CRC Press, March 2011.
- [6] Wu-chun Feng (Editor). *Green Computing: Large-Scale Energy Efficiency*. CRC Press, January 2011.
- [7] Frank Teuteberg and Jorge Marx Gomez. *Corporate Environmental Management Information Systems: Advancements and Trends*. IGI-Global, 2010.
- [8] Bhuvan Unhelkar. *Handbook of Research on Green ICT: Technology, Business and Social Perspectives*. IGI-Global, 2010.
- [9] Gary Moore. *The Dark Side of Green: The Unintended Consequences of the Climate Change Movement*. CRC Press, April 2011.
- [10] <<http://www.wipro.in/Products/greenpc/index.htm#1>>
- [11] <<http://content.dell.com/us/en/corp/d/press-releases/2009-05-20-TBR-Green-Report.aspx>>
- [12] <<http://www.redbooks.ibm.com/abstracts/redp4413.html>>
- [13] <<http://www.vmware.com/solutions/green-it>>
- [14] <http://www.mbtmag.com/article/194428,Green_computing_Sun_helping_partners_offer_eco_friendly_services_php>
- [15] <http://docs.google.com/gview?a=v&q=cache:XH0R_gojM4kJ:www.indiaprwire.com/pdf/pressrelease/200711265832.pdf+via+technology+green+computing&hl=en&gl=in&sig=AFQJCNFy9M6GvpxXBx920VePk57uNZ6fA>

Optimization of Server Management for WebSphere Application Server

Rajeev Ranjan¹, Wajid Ali² and Shusma Rana³

¹Dept. of CSE, RVCE Bengaluru

^{2,3}Computer Science and Engineering, HITM, Ambala, Kurukshetra University

Abstract—Server Management is a process of managing the server which includes communicating to the server, administration and configuration of server for better performance and quick response to the administrator. There are many tools which can be used to manage the Server but still there is need of tool which can manage the server very effectively and reliably and provides good interface to the administrator by assisting at each and every step of management of server. The framework that is developed to manage the server uses an efficient and effective approach to manage the server by considering the optimization of performance issue of the server. Optimization of server management is done by caching the results of administration and configuration.

Keywords: Caching, Optimization, Response Time

INTRODUCTION

The paper basically states about set of aspects of sever management process with respect to the IBM WebSphere Application Server product in order to enhance the performance and efficiency of the management process. Application servers are at the core of any enterprise business in current trends of IT industry and it supports for On Demand Business and Service Oriented Architecture (SOA) for any enterprise. In general the sever management process states about the administration and configuration of the server to provide better performance to the end user while maintaining good health of the server. According to paper server management process basically deals with the connection establishment, administration and configuration of the server where server may be installed on the local or remote machine. The process of administration of server with existing Web based tool is Administrative Console. The Administrative console is the currently used tool which is Web based tool that user make use of it to manage the server i.e. IBM WebSphere Application Server product. The Administrative console supports a full range of product administrative activities. The flow of administration of the WebSphere

Application Server using administrative console is shown in Figure 1.



Fig. 1: Flow of Execution for Administration of WebSphere Application Server

The Application Server is at the heart of any enterprise business to support the smooth running and effective management of the resources by considering current and future business requirements. The management of the Server is very critical in order to achieve the better performance and quick response to the end user. The process of server management should be optimized and reliable to achieve the requirements of the end user. The management of WebSphere Application Server through the Administrative console is based on the use of Java Management Extensions

(JMX) [1]. JMX is a framework that provides a standard way of exposing Java resources, for example application servers, to a system management infrastructure. The JMX framework allows a provider to implement functions, such as listing the configuration settings, and allows users to edit the settings. It also includes a notification layer that can be used by management applications to monitor events such as the startup of an application server.

Each time end user perform any task of administration and configuration then the process of execution follows the approach shown in Figure 1. There are situations where in the administrator or end user performs the same set of operation on the server that's is being performed recently then also the request go through the Web Server and Application Server as shown in Figure 1 which consumes lot of resources and time which is very critical.

The administrator or end user is in need of a way which provides more flexibility, reliability and optimization of performance in management of the server than the existing web based approach. In the following how the framework that's been designed will do the needful to the administrator to effectively and efficiently manage the server to achieve the better performance.

RELATED WORK

There are different approaches to manage the application server for WebSphere family. The two important approaches are explained below which manage the server effectively.

The system management concepts in WebSphere Application Server might seem complex. However, the fact that the system management architecture is based on JMX and the fact that WebSphere Application Server provides easy-to-use administration tools makes it fairly simple to use and understand [1].

The first approach is through administrative console or Integrated Solutions console [2] is a Web-based interface that provides configuration and operation capability. The administrator connects to the application using a Web browser client. Users are assigned with different administration roles for managing the application server and certain components and services using this interface [1]. The Administrative Console is a graphical interface that provides many features to guide you through deployment and systems administration tasks [3]. It is extremely useful for helping you start exploring the available management options. Various wizards guide you through the more complicated processes. The Administrative Console program is documented in the Application Server Version 5 Info Center [4].

The second approach is through wsadmin scripting client provides extra flexibility over the Web-based administration application, allowing administration to use the command-line interface. Using the scripting client not only makes administration quicker, but it automates the administration of multiple application servers and nodes using scripts [1]. The wsadmin tool is Command-line tool where in simple programs that you run from a command prompt to perform specific tasks. Using the command-line tools, you can start and stop application servers, check server status, add or remove nodes, and complete similar tasks [3]. The observation made out of many existing administrative tools for management of server shows that wsadmin tool provides more flexibility in managing the server [5].

The observation states that server management process which includes administration and configuration of application server need to offer flexibility, reliability and better performance. The paper states about the global framework which can deal with set of aspects that are necessary for the optimization of server management process and provide better way for managing the server. The global framework provides flexibility in managing the server which enables end user to write the scripts in any of the scripting language i.e. Jython or Jacl [2] and providing meaningful information to the end user that's is more readable and understandable. The global framework is more reliable and secured way of communicating to the server for management purpose. The global framework optimizes the server management process by caching the results at the client machine. Thus the cached results can be used if end user performing the same set of operations that's recently performed by last user such that there is no any configuration modification.

SYSTEM DESIGN

The system design of the framework makes use of the observation and related work carried out for performing the server management. As it's known that every tool that's been designed make the server management will comes with its own pros and cons. In similar way approaches that's described in related work comes with some pros and cons.

The Administrative Console gives good interface for the end user for the management of all the administrative activity of WAS but few times it fails to provide instantly reliable results and updated status to the end user. The Administrative console is a Web based tool for managing the WAS where it make use of the HTTP protocol through Http server so web server may get overloaded with 'N' number of request from the different user during peak hours which can be avoided by using the desktop client side application to manage the WAS. The Administrative console may not perform up to the expectation of the end user during peak hours and reliable and updated services so the need of framework is much more required. As shown in Figure1 the administrative console will forward its entire request through the web server for administration of server.

The wsadmin scripting mechanism to manage the server is a command oriented [5] which brings lot of manual work and more complexity in understanding the syntactic structure of wsadmin objects to manage the server. There is lot of complication in understanding of the wsadmin tool which includes the launching wsadmin tool, configuring wsadmin tool, command and script invocation on wsadmin tool and wsadmin objects [6]. The process of management of sever through wsadmin tool is more reliable and flexible than the Administrative console only it lacks is the good interface for the novice user to manage the server.

The framework is designed to manage the Web Sphere Application Server by considering few of the pros and cons of the existing tools to manage the Web Sphere Application server. The framework can be used to manage the local or remote server i.e. server may be installed on local or remote machine.

The framework designed to manage the server make use of the wsadmin tool where the scripts for administration and the configuration can be executed.

The performance of the server management process can be enhanced by caching the results at the client machine. The cached results can be used whenever the end user performing the set of administration activity which are recently performed by last administrator could be used to provide the results to the end user. The consistency of the results are retained by changing the set of flag values whenever the configuration of the server changes.

The performance of the server management process is optimized during the peak hours as the framework designed does not make use of the HTTP protocols for communicating to the Web Sphere Application Server. Hence by making use of the caching and no web server in the management of the server performance is optimized. Figure 2 shows the flow of execution of the framework for management of Web Sphere Application Server.

The framework designed performs the administration and configuration activity for the WebSphere Application Server Network Deployment v7.0.

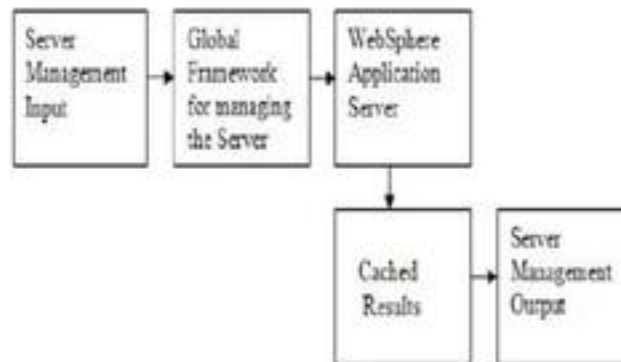


Fig. 2: Flow of execution for Management of WebSphere Application Server through Framework

SYSTEM ADMINISTRATION

The administrative activity that can be performed by framework includes listing of the different resources on the WebSphere Application Server i.e. applications, datasources, and server instances etc. The administration also includes the checking the status of the server and applications which are deployed on the WebSphere environment. The status indicates the mode in which the server and application will be present i.e. RUNNING or STOPPED. If end user performs any of these activities then the corresponding scripts will be executed on the wsadmin tool. The wsadmin tool fetches correct and updated results which show the status of the WebSphere Application Server. Results will be cached in client machine as shown in the Figure 2 then end user is provided with server management results from the cached location. The consistency of the cached results is maintained depending on the flag values which changes according to few of the configuration tasks being performed by administrator. The performance of the server management can be optimized by making use of the cached results at client machine. The end user can fetch the results very quickly from the cached location because it's located on the client machine so less delay in fetching the results to the end user. The response time is reduced very considerably as the user will be using the cached results from the client machine. The use of the resources for administration are also very less when user performing the activity of administration which is very similar to the recently performed activity of administration. The results fetched to the end user are reliable and consistent.

SYSTEM CONFIGURATION

The configuration activity that can be performed by framework includes deploy and undeploy the application, modifying the datasource connection pool values, configuring the server port name and values and starting and stopping of the application or the server. The process of configuration follows the flow of execution as shown in Figure 2. The consistent results in case of configuration are maintained depending on the flag values which used to control the flow of execution. Here the results that are cached will be used serve the information to the end user. Thus user will get quick response from the cached location and the resources used for administration and configuration activity are also very minimal i.e. framework don't make use of the wsadmin tool and web server when fetching the results from the cached location.

APPROACH FOR OPTIMIZATION

The server management process can be optimized in case of the framework by caching the results and avoiding HTTP protocols usage. In this paper caching the result states that results are stored at the client machine hard disk not at the real cache of the system. The cached results may be used in future for analyzing the status and getting information about the

WebSphere environment when the server crashes i.e. resources used in terms of number of application deployed, server instances and datasources. Consider a scenario where framework will make use of cached results is if administrator lists number of application being deployed on server, then the result of this administration task will remain static till administrator deploy a new application. So the cached results can be used without executing the scripts on the wsadmin tool and results will be consistent and reliable hence quick response and less resources used. This approach is applicable to many of the administrative tasks. As and when configuration of the server changes the flag value changes hence the updated results will be available to end user which follows the flow of execution as shown in Figure 2.

ADVANTAGES OF THE FRAMEWORK

- The Framework is more reliable and flexible for managing the server as it fetches updated results to the end user which is more accurate.
- The Framework makes use of the caching concept for enhancing the performance of the server management process by reducing the response time.
- The management of both local and remote server is very similar and the assistance for end user is provided at every step of management process to make maximum use of the framework.
- In case of any connectivity [network connection] problem with remote server or the local server i.e. sever crashes then the locally cached results can be used to get the details about the application server for analysis.

CONCLUSION

The process of server management process through framework is more effective and reliable. The framework is designed to optimize the performance of server management hence its more flexible and reliable then the existing tools. The framework which is designed has limited scope of administration and configuration for WebSphere Application Server. In future the scope of framework can be extended and the framework can be made to work very effectively and reliably on multiple platforms i.e. on UNIX, MAC and AIX etc currently it works successfully on windows platform. In future the framework incorporates the advanced administration and configuration activity for the WebSphere Application Server.

REFERENCES

- [1] Carla Sadler, Lars Bek Laursen, Martin Phillips, Henrik Sjostrand, Martin Smithson, Kwan-Ming Wan "WebSphere ApplicationServer V6: System Management and Configuration Handbook" February 2005 International Technical Support OrganizationSG24-6451-00.
- [2] "WebSphere Application Server V7.0: Concepts, Planning, and Design" IBM Redbooks developed by the IBM International Technical Support Organization.
- [3] Leigh Williamson, Lavena Chan, Roger Cundiff, Shawn Lauzon, Christopher C. Mitchell "IBM® WebSphere® System Administration", IBM press, July 12, 2004, Page 7-11.
- [4] Starting the wsadmin scripting client" http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/iindex.jsp?topic=/com.ibm.websphere.express.doc/info/e xp/ae/txml_launchscript.html.
- [5] Arden Agopyan, Hermann Huebler, Tze Puah, Thomas Schulze, David Soler, Martin Keen "WebSphere Application Server V6.1: Technical Overview" An IBM Redpaper publication 2009.
- [6] Carla Sadler, Albertoni, Bernardo Fagalde, Thiago Kleinubing, Henrik Sjostrand, Ken Worland, Lars Bek Laursen, Martin Phillips, Martin Smithson, Kwan-Ming Wan "WebSphere Application Server V6.1: System Management and Configuration" November 2006.

Wireless Security in IGNOU

Vidya Varidhi Upadhyay

Deputy Director, Indira Gandhi National Open University, New Delhi

Abstract – Wireless networks are emerging as a significant aspect of networking; wireless local area networks (WLANs), Bluetooth, and cellular systems have become increasingly popular in the education and computer industry, with consequent security issues. WLANs, especially the Institute of Electrical and Electronics Engineers (IEEE) 802.11 networks, are becoming common access networks in private and public environments. This study investigated the performance and security issues of IEEE 802.11 wireless networks using layered security models. Models, such as 802.1X and virtual private network (VPN), were selected from a variety of proposed security mechanisms. This study consisted of a performance evaluation with layered security implementations to provide us with a set of possible operating and management parameters. These parameters may be incorporated into secure wireless network management policies in educational institutions in India.

Keyword: Wireless network security, Wireless Security, Server Security, IGNOU, Wi-Fi

WIRELESS LANS

A Wireless Local Area Network (WLAN) is a computer network that transmits and receives data with radio signals instead of wires. WLANs are used increasingly in both home and educational environments, and public areas such as airports, and universities. Innovative ways to utilize WLAN technology are helping people to work and communicate more efficiently. Increased mobility and the absence of cabling and other fixed infrastructure have proven to be beneficial for many users.

Unlike a wired LAN, which requires a wire to access the network, a WLAN facilitates network transmissions of data from computers and other components through an *access point (AP)*. An AP typically provides a range (cell or area coverage) of 100 metres. IEEE 802.11 is an international standard providing transmission speeds ranging from 1 Mbps to 54 Mbps in either the 2.4 GHz or 5 GHz frequency bands. The 802.11b is the dominant WLAN technology at present, and provides an expected data throughput of 5.5 Mbps.

Wireless WANs

A WWAN is a computer network that extends over a large geographical area. Characteristically, a WWAN receives and transmits data using radio signals over an interconnection with a mobile computer system. At the mobile switching centre, WWAN segments then connect to either a specialised public or private network via telephone or other high-speed communication link.

The research goal of this study is to identify the performance and security issues of WLANs using layered security models and its implementation in IGNOU. This goal is subdivided into three research questions:

- Is the network performance of the model at each security level the same?
- Are there any impacts on performance resulting from using the 802.1X and VPN models?
- Does security have an impact on different traffic types?

Wong provided perhaps the most well prepared study that was found on the subject matter. In addition to using standard TCP and UDP traffic, he examined specific types of traffic such as HTTP and file transfer protocol (FTP).

Authentication and Encryption Protocols

The IEEE 802.11 standard has several methods of encryption and authentication that provide varying levels of security for wireless networks [Sankar04]. This process allows an organization to restrict access of its wireless network to certain individuals just as it would restrict access to its wired network. Without proper authentication a wireless client will not be able to associate with a wireless access point and therefore will be unable to gain access to network resources. Encryption is a process of shielding transmitted data by changing the structure of the data with a known process by one of the following two methods: the use of a symmetric key paradigm or an asymmetric key paradigm.

Authentication

There are several authentication methods and protocols that can be implemented within a wireless network; however, only certain ones are of interest in this research. The authentication protocol used for this research is Remote Address Dial-In User Service (RADIUS) which was developed in 1996. Additionally, the methods of authentication that the research focuses on are: 802.1x, Extensible Authentication Protocol (EAP), Protected EAP (PEAP), and the Lightweight EAP (LEAP).

Authentication begins at the client which passes identity information through the access point to the authentication server where credentials are verified. Once verification is complete the access point will grant access to the wireless client.

The following information provides an overview of these authentication methods and protocols so that it can be established how they introduce overhead to IEEE 802.11 networks.

OVERVIEW OF IEEE 802.1X

There are a few important points with regards to IEEE 802.1x. The first is that it provides a method to supply user or client-based authentication to a network with individual user names and passwords, tokens, certificates, or other methods. This is important because it can be effectively utilized in large scale networks as an authentication medium for both an organization's wired and wireless networks with almost no overhead on those networks.

Encryption

Encryption provides a method for wireless networks to provide end-to-end security on data streams. IEEE 802.11 networks currently have three encryption protocols available for use today: WEP, Temporal Key Integrity Protocol (TKIP), and Counter Mode/CBCMAC Protocol (CCMP). Although WEP does not provide the security required by most networks, and TKIP and CCMP are quickly becoming the minimum standards to use for data encryption on wireless networks, it is still in wide use and is examined in this research.

EXPERIMENTATION

Common Criteria Assessment

Common Criteria is an internationally recognised method for certifying the security of IT products and systems. *Security audit*: recognises, records, stores and analyses information related to relevant security activities, e.g. remote user access information. *Communication*: assures the identity of parties involved in a data exchange (nonrepudiation).

- *Cryptographic Support*: supports high-level security objectives and key management.
- *User Data Protection*: Ensures user data will not be exposed to danger, via encryption and access control.
- *Identification and Authentication*: establishes and verifies a claimed user identity.
- *Security Management*: manages aspects of the security component such as the security component's data and attributes.
- *Privacy*: user protection against the discovery and misuse of a user's identity by other users.
- *Protection of Security Functions*: provides the integrity and management of the component that provides the security mechanisms.
- *Resource Utilisation*: Utilises the performance of the component, such as resource allocation.
- *Component Access*: controls the establishment of a user session.
- *Trusted Path/ Channel*: provides a trusted communication path between user and a security component, e.g. a secured path between a remote user and an authentication
- Server.

Hardware Used

- Netgear G54 Wireless PCI Adapter (WG311 v3).
- Wireless Access Point DWL-3200 AP from Dlink (ver. 2.50 (WW), 802.11g).
- Existing LAN in IGNOU

Specification

DWL 3200 AP has the following technical specification. It supports IEEE 802.11b, IEEE 802.11g, IEEE 802.3, IEEE 802.3u, IEEE 802.3x standards. It has Web Browser interface as well as command line interface (telnet) for network management and supports HTTP and Secure HTTP (HTTPS). Usual data transmission rates for 802.11g: • 54, 48, 36, 24, 18, 12, 9 and 6 Mbps and for 802.11b 11, 5.5, 2, and 1Mbps Wireless Frequency Range is from 2.4GHz to 2.4835GHz

Security

The DWL-3200AP provides the latest wireless security technologies by supporting WPA and WPA2 and includes personal and enterprise versions along with 802.1x. For additional network access security, the DWL-3200AP supports VLAN tagging to provide internal and guest network access options. Other security features included are: MAC Address Filtering, Wireless LAN segmentation, Rogue AP detection, etc.

The experiment was conducted using Windows-based operating systems – Windows 2000 Advanced Server and Windows XP. DLINK AP-3200 access point was used as the medium between the server and the client to facilitate wireless connections.

The components were as follows

- The server used Windows 2000 Advanced Server platform to provide access controls.
- The client used the Windows XP operating system, which supported 802.1X authentications.
- The AP used the DLINK 3200 AP product.
- Transmission speeds used in the experiments:
- Between the server and the AP was a 90 Mbps Ethernet connection
- Between the AP and the client was an 11 Mbps wireless connection

CONCLUSION

As the security level gets higher, the general observed trend is increased response times and decreased throughputs. The 802.1X model provides better response times and throughputs than the VPN model; the IPSec-based VPN model provides end-to-end security that produces more performance overheads. It was observed that FTP performed better than HTTP, because the nature of their transmission is different and means that HTTP requires more interaction between the server and the client.

Inverse relationship was found in both 802.1X and VPN models between response time and throughput: as response time increased throughput decreased. Deploying the 802.1X infrastructure causes increased performance degradation compared to the 802.11 standard. MAC address authentication produces no performance overheads when compared to the default security setting, and thus should be used at all times.

The 802.11 standard's WEP (shared key) authentication creates a positive effect on FTP throughput but decreased HTTP throughput by 5.5%. Since the effect is small, WEP authentication should be deployed.

WEP encryption improved the network performance slightly, at approximately 4.5% in HTTP. However, different longer key lengths 128 bits impacted FTP performance less than 15%. Depending on the nature of traffic transmission, the strongest key length should be deployed.

An authenticated tunnel created a response time delay of more than 235% for FTP and 103% for HTTP. Throughputs were reduced by more than 40%. This may be due to the transaction size or the transmission medium differences. Different tunnelling technologies impacted only the response time of the traffic; with HTTP traffic affected slightly. Certificate-based authentication (EAP-TLS) generated more than 15% delay and reduced throughput by approximately 17% for all traffic types.

Implementing a firewall actually improved the network performance by more than 13% regardless of which tunnelling protocol was used. Since the number of packets before and after the firewall implementations are roughly the same, the only factor altered was the response time. One possible explanation could be that the software firewall and router reside on the same Windows machine causing side effects that produce positive results on network performance (for example, interactions between the firewall software and the TCP/IP stack).

IMPLEMENTATION

The lessons learnt from the experiment were implemented in Wireless security at IGNOU –HQ. In general the following information played a major role in implementing wireless security in IGNOU.

- Deploying -MAC and WEP authentication created no overheads.
- Different authentication methods created different levels of performance overhead; EAP-TLS generated the longest delay and decreased throughput. A comparison of the authentication mechanisms can be summarised as follows:
- EAP-TLS > EAP-MD5/CHAP > WEP > MAC
- Tunnelling produced large overheads; IPSec overheads > PPTP overheads.
- WEP encryption impact on performance varied; key length affected only response times. However, when WEP encryption was used in conjunction with 802.1X-based authentication, network performance was dramatically degraded.
- Deploying DES cryptographic methods introduced large overheads, however, there was not much difference between 3DES and DES, especially when used with a certificate-based authentication.
- The interaction of authentication and encryption generated different results from adding encryption to the same authentication methods for FTP and HTTP traffic. EAP-TLS produced the most adverse impact.
- Firewall deployment (router integrated) provided some interesting results.
- Performance was actually improved instead of degraded. Further investigation is required.

LIMITATIONS

Information Technology security requires both human intervention and technical support to provide a secure network solution. This research focused on the technical support for a secured wireless network. The human aspects (like hacking and related issues) are equally important but will not be investigated due to the limited timeframe and resources.

This study examined only one type of wireless network, the 802.11 standard in IGNOU's environment; the results of this study might not be applicable to all other types of wireless networks and in different situations.

One inherent limitation is using vendor-specific equipment. Different vendors provide different capabilities.

The characteristic of FTP and HTTP application protocols provide different file sizes thus direct comparison will show limited results.

FUTURE WORK

As wireless network access grows, new opportunities will be created. In our country India where face to face education is a great challenge, the opportunity to provide video lectures, online course delivery, on demand examination and finally allowing faculty as well as students to use the server using their wireless equipment's will empower them in true sense.

The advantage of increasing mobility will lead to stronger demand for QoS, and simpler roaming structure at a secured connection.

Present research was limited to a single client and server pair operating in a single cell, and future work could incorporate inter-cell or inter-AP support for single and multiple users.

To further widen the scope, experiments using multimedia data types at various sizes could be conducted.

REFERENCES

- [1] Agarwal, Avesh, K., Wang, Wenye. Measuring Performance Impact of Security Protocols in Wireless Local Area Networks. Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC.
- [2] Baghaei, Nilufar. IEEE 802.11 Wireless LAN Security Performance Using Multiple Clients. Department of Computer Science and Software Engineering, University of Canterbury, Christchurch, New Zealand,(2003).
- [3] Hideki, Imai, (2006), Wireless Communications Security. Norwood, MA, Artech House, Inc.

A New Concept of Data Mining: Data Stream Mining

Kuldep¹ and Sumit²

¹Student, U.I.E.T MDU

²Asst. Prof., Suraj College of Engineering

Abstract—The recent advances in hardware and software have enabled the capture of different measurements of data in a wide range of fields. These measurements are generated continuously and in a very high fluctuating data rates. The storage, querying and mining of such data sets are highly computationally challenging tasks. Data stream mining is concerned with extracting knowledge structures represented in models and patterns in non stopping streams of information. The research in data stream mining has gained a high attraction due to the importance of its applications and the increasing generation of streaming information. Applications of data stream analysis can vary from critical scientific and astronomical applications to important business and financial ones. Algorithms, systems and frameworks that address streaming challenges have been developed over the past

Keywords: Data Mining

INTRODUCTION

The intelligent data analysis has passed through a number of stages. Each stage addresses novel research issues that have arisen. Statistical exploratory data analysis represents the first stage. The goal was to explore the available data in order to test a specific hypothesis. With the advances in computing power, machine learning field has arisen. The objective was to find computationally efficient solutions to data analysis problems. Along with the progress in machine learning research, new data analysis problems have been addressed. Data mining is that interdisciplinary field of study that can extract models. Advances in networking and parallel computation have lead to the introduction of distributed and parallel data mining. The goal was how to extract knowledge from different subsets of a data set and integrate these generated knowledge structures in order to gain a global model of the whole dataset. Client/server, mobile agent based and hybrid models have been proposed to address the communication overhead issue. Different variations of algorithms have been developed in order to increase the accuracy of the generated global model.

DATA MINING TECHNIQUES

Data mining is a branch of computer science. It is the process of extracting patterns from large data sets by combining methods from statistics and artificial intelligence with Data base management. The Various data mining techniques is

Clustering

Babcock et al. [6] have used exponential histogram (EH) data structure to improve Guha et al. The inspiration behind sliding window is that the user algorithm. They use the same method described more concerned with the above, however they address the problem of merging clusters when the two sets of cluster centers to be merged are far apart by maintaining the EH data structure. They have studied their proposed algorithm analytically.

Charikar et al [10] have proposed another k-median algorithm that overcomes the problem of increasing approximation factors.

Domingos et al. [14, 15] have proposed a general method for scaling up machine learning algorithms. They have termed this approach Very Fast Machine Learning VFML.

Aggarwal et al. [1] have proposed a framework for clustering data streams called CluStream algorithm.

Gaber et al. [19] have developed Lightweight Clustering LWC. It is an AOG-based algorithm. AOG has been discussed in section 2. The algorithm adjusts a threshold that represents the minimum distance measure between data items in different clusters. This adjustment is done regularly according to a pre-specified time frame. It is done according to the available resources by monitoring the input-output rate. This process is followed by merging clusters when the memory is full.

Classification

Ganti et al. [17] have developed analytically an algorithm for model maintenance under insertion and deletion of blocks of data records. This algorithm can be applied to any incremental data mining model. They have also described a generic framework for change detection between two data sets in terms of the data mining results they induce. They formalize the above two techniques into two general algorithms: GEMM and FOCUS. The algorithms have been applied to decision tree models and the frequent item set model. GEMM algorithm accepts a class of models and an incremental model maintenance algorithm for the unrestricted window option, and outputs a model maintenance algorithm for both window-independent and window dependent block selection sequence. FOCUS framework uses the difference between data mining models as the deviation in data sets.

First Impression: 2012

© Teerthanker Mahaveer University, Moradabad-244001, U.P., India

Resurging India—Myths & Realities

ISBN: 978-93-82062-04-2

No part of this publication may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owners.

DISCLAIMER

The authors are solely responsible for the contents of the papers compiled in this volume. The publishers or editors do not take any responsibility for the same in any manner. Errors, if any, are purely unintentional and readers are requested to communicate such errors to the editors or publishers to avoid discrepancies in future.

Published by

EXCEL INDIA PUBLISHERS

61/28, Dalpat Singh Building, Pratik Market, Munirka, New Delhi-110067

Tel: +91-11-2671 1755/ 2755/ 5755 ● Fax: +91-11-2671 6755

E-mail: publishing@excelpublish.com

Website: www.excelpublish.com

Typeset by

Excel Publishing Services, New Delhi-110067

E-mail: prepress@excelpublish.com

Printed by

Excel Printing Universe, New Delhi-110067

E-mail: printing@excelpublish.com

...Fig. 1 (Contd.)

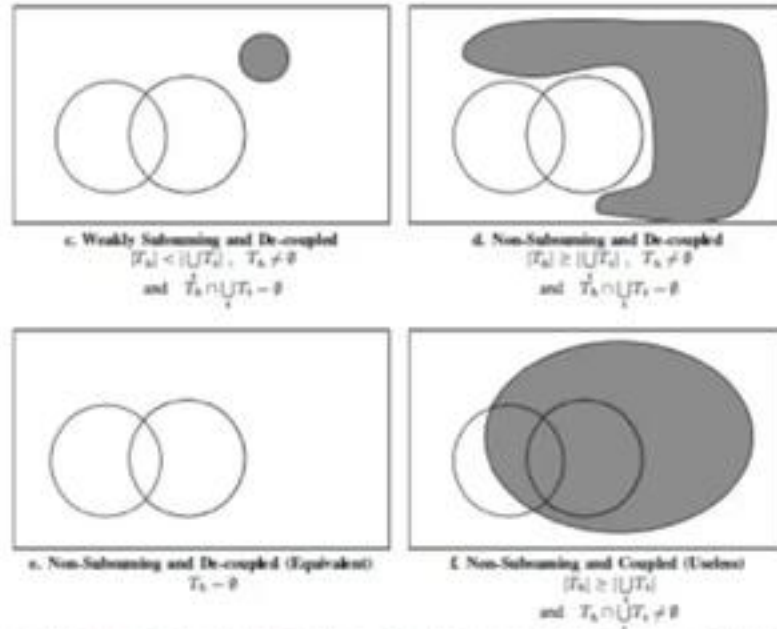


Fig. 1. HCMs Classification. These pseudo Venn diagrams depict the relationship between some of the interesting classes of HCMs and their first order constituents. In each of the six examples, the rectangle depicts all possible test inputs. The two circles within each rectangle depict the possible regions of test cases that can kill a HCM in the standard way for a Venn Diagram. The shaded region indicates the killing test sets for the HCMs. The size of the shaded region is intended to show the relative size of the HCM kill sets compared to the HCM kill sets. Because it attempts to show an idea, the diagram is a "pseudo" Venn Diagram, rather than a true Venn Diagram. For ease of exposition, the diagrams illustrate only the second order case, whereas the definitions cover arbitrary order HCMs of type (a), (b) and (c) are harder to kill than their constituent HCMs, thereby capturing potentially subtle facts. In particular, type (a) are both useful and useful, they can replace their constituent HCMs because they are killed by a subset of the intersection of test cases that kill their constituents. For a HCM h , constructed from HCMs f_1, \dots, f_n , the test set T_h contains all the test cases that kill h , while the test sets T_1, \dots, T_n are the test sets that kill f_1, \dots, f_n respectively.

Fig. 1

REASONS TO SUPPORT HOM

1. Cost: Work on Mutant Sampling and Selective Mutation has shown how the number of mutants can be reduced with only a small impact on test effectiveness [1], [8], [7], [17].
2. Uncertainty: Work on reducing the impact of equivalent mutants has reduced, though not eradicated, this problem [6], [16], [5], [4], [1].
3. Realism: Empirical evidence has been provided that the faults denoted by mutants do, indeed, overlap with a class of real faults [16], [12], [5].

PROPOSED WORK

In order to explain Higher Order Mutation Testing we take the following example.

```
Original_Program
{if ( (a>b) && (a>c)).....}
```

We create a first order mutant of the Original_Program by adding a single fault i.e. we change a>b to a<b and name it FOM1 as below:

```
FOM1
{if ( (a<b) && (a>c)).....}
```

We create another first order mutant of the Original_Program by adding a single fault i.e. we change a>c to a<c and name it FOM2 as below:

```
FOM2
{if ( (a>b) && (a<c)).....}
```

FOM1 and FOM2 are first order mutants as they vary by a single fault from the Original_program. Now we create a HOM from FOM1 and FOM2 by having more than one fault from the Original_program. Our HOM differs from original program by 2 faults. We change a>b to a<b and also a>c to a<c.

```
HOM
{if ((a<b) && (a<c)).....}
```

Domingos et al. [14] have developed VFDT. It is a decision tree learning systems based on Hoeffding trees. It splits the tree using the current best attribute taking into consideration that the number of examined data items used satisfies a statistical measure which is Hoeffding bound. The algorithm also deactivates the least promising leaves and drops the non-potential attributes.

Aggarwal et al. have adopted the idea of micro clusters introduced in CluStream in On-Demand classification [3] and it shows a high accuracy. The technique uses clustering results to classify data using statistics of class distribution in each cluster.

Ding et al. [13] have developed a decision tree based on Peano count tree data structure. It has been shown experimentally that it is a fast building algorithm that is suitable for streaming applications.

Frequency Counting

Giannella et al. [18] have developed a frequent item sets mining algorithm over data stream. They have proposed the use of tilted windows to calculate the frequent patterns for the most recent transactions based on the fact that users are more interested in the most recent transactions. They use an incremental algorithm to maintain the FP-stream which is a tree data structure to represent the frequent itemsets. They conducted a number of experiments to prove the algorithm efficiency.

Cormode and Muthukrishnan [12] have developed an algorithm for counting frequent items. The algorithm uses group testing to find the hottest k items. The algorithm is used with the turnstile data stream model which allows addition as well as deletion of data items. An approximation randomized algorithm has been used to approximately count the most frequent items. It is worth mentioning that this data stream model is the hardest to analyze. Time series and cash register models are computationally easier. The former does not allow increments and decrements and the later one allows only increments.

Gaber et al. [19] have developed one more AOG-based algorithm: Lightweight frequency counting LWF. It has the ability to find an approximate solution to the most frequent items in the incoming stream using adaptation and releasing the least frequent items regularly in order to count the more frequent ones.

Time Series Analysis

Chen et al. [11] have proposed the application of what so called regression cubes for data streams. Due to the success of OLAP technology in the application of static stored data, it has been proposed to use multidimensional regression analysis to create a compact cube that could be used for answering aggregate queries over the incoming streams. This research has been extended to be adopted in an undergoing project Mining Alarming Incidents in Data Streams MAIDS.

RESEARCH ISSUES

Data stream mining is a stimulating field of study that has raised challenges and research issues to be addressed by the database and data mining communities. The following is a discussion of both addressed and open research issues [16, 19]:

Transferring data mining results over a wireless network with a limited bandwidth; Knowledge structure representation is another essential research problem. [4] and the ubiquitous data stream mining approaches: it is an essential issue that should be addressed to realize a fully functioning ubiquitous mining. The integration among storage, querying, mining and reasoning over streaming information would realize robust streaming systems that could be used in different applications. Current database management systems have achieved this goal over static stored datasets.

The needs of real world applications: The relationship between the proposed techniques and the needs of the real world applications is another important issue. Some of the proposed techniques attempt to improve computational complexity of the mining algorithms with some margin error without taking care to the real needs of the applications that will use the proposed approach. Since data mining is an applied scientific discipline, the requirements of the applications should be stated clearly in order to achieve the analysis objectives.

The formalization of real-time accuracy evaluation: That is to provide the user by a feedback by the current achieved accuracy with relation to the available resources and being able to adjust according to the available resources.

SUMMARY

The dissemination of data stream phenomenon has necessitated the development of stream mining algorithms. The area has attracted the attention of data mining community. The proposed techniques have their roots in statistics and theoretical computer science. Data-based and task-based techniques are the two categories of data stream mining algorithms. Based on these two categories, a number of clustering, classification, frequency counting and time series analysis have been developed. Systems have been implemented to use these techniques in real applications. Mining data streams is still in its infancy state. Addressed along with open issues in data stream mining are discussed in this paper. Further developments would be realized over the next few years to address these problems. Having these systems that address the above research issues developed, that would accelerate the science discovery in physical and astronomical applications [20].

REFERENCES

- [1] C. Aggarwal, J. Han, J. Wang, P. S. Yu, A Framework for Clustering Evolving Data Streams, Proc. 2003 Int. Conf. on Very Large Data Bases, Berlin, Germany, Sept. 2003.
- [2] C. Aggarwal, J. Han, J. Wang, and P. S. Yu, A Framework for Projected Clustering of High Dimensional Data Streams, Proc. 2004 Int. Conf. on Very Large Data Bases, Toronto, Canada, 2004.
- [3] C. Aggarwal, J. Han, J. Wang, and P. S. Yu, On Demand Classification of Data Streams, Proc. 2004 Int. Conf. on Knowledge Discovery and Data Mining, Seattle, WA, Aug. 2004.
- [4] A. Arasu, B. Babcock, S. Babu, M. Datar, K. Ito, I. Nishizawa, J. Rosenstein and J. Widom, STREAM: The Stanford Stream Data Manager Demonstration description - short overview of system status and plans; in Proc. of the ACM Intl Conf. on Management of Data, June 2003.
- [5] B. Babcock, S. Babu, M. Datar, R. Motwani, and J. Widom. Models and issues in data stream systems. In Proceedings of PODS, 2002.
- [6] B. Babcock, M. Datar, R. Motwani, L. O'Callaghan: Maintaining Variance and k-Medians over Data Stream Windows, Proceedings of the 22nd Symposium on Principles of Database Systems, 2003.
- [7] R. Bhargava, H. Kargupta, and M. Powers, Energy Consumption in Data Analysis for On-board and Distributed Applications, Proceedings of the ICML'03 workshop on Machine Learning Technologies for Autonomous Space Applications, 2003.
- [8] M. Buel, Ch. Fowlkes, J. Roden, A. Stechert, and S. Mukhtar, Diamond Eye: A distributed architecture for image data mining, in SPIE DMKD, Orlando, April 1999.
- [9] Y. D. Cai, D. Clutter, G. Pape, J. Han, M. Welge, L. Auvil, MAIDS: Mining Alarming Incidents from Data Streams. Proceedings of the 23rd ACM SIGMOD International Conference on Management of Data, June 13-18, 2004, Paris, France.
- [10] M. Charikar, L. O'Callaghan, and R. Panigrahy. Better streaming algorithms for clustering problems In Proc. of 35th ACM Symposium on Theory of Computing, 2003.
- [11] Y. Chen, G. Dong, J. Han, B. W. Wah, and J. Wang, Multi-Dimensional Regression Analysis of Time-Series Data Streams In VLDB Conference, 2002.
- [12] G. Cormode, S. Muthukrishnan What's hot and what's not: tracking most frequent items dynamically, PODS 2003: 296-306
- [13] Q. Ding, Q. Ding, and W. Perrizo, Decision Tree Classification of Spatial Data Streams Using Peano Count Trees, Proceedings of the ACM Symposium on Applied Computing, Madrid, Spain, March 2002.
- [14] P. Domingos and G. Hulten. Mining High-Speed Data Streams. In Proceedings of the Association for Computing Machinery Sixth International Conference on Knowledge Discovery and Data Mining, 2000.
- [15] P. Domingos and G. Hulten, A General Method for Scaling Up Machine Learning Algorithms and its Application to Clustering, Proceedings of the Eighteenth International Conference on Machine Learning, 2001, Williamstown, MA, Morgan Kaufmann
- [16] G. Dong, J. Han, L.V.S. Lakshmanan, J. Pei, H. Wang and P.S. Yu. Online mining of changes from data streams: Research problems and preliminary results, In Proceedings of the 2003 ACM SIGMOD Workshop on Management and Processing of Data Streams. In cooperation with the 2003 ACM-SIGMOD International Conference on Management of Data, San Diego, CA, June 8, 2003.
- [17] V. Ganti, Johannes Gehrke, Raghu Ramakrishnan: Mining Data Streams under Block Evolution. SIGKDD Explorations 3(2), 2002.
- [18] C. Giannella, J. Han, J. Pei, X. Yan, and P.S. Yu, Mining Frequent Patterns in Data Streams at Multiple Time Granularities, in H. Kargupta, A. Joshi, K. Sivakumar, and Y. Yesha (eds.), Next Generation Data Mining, AAAI/MIT, 2003.
- [19] Gaber, M. M., Krishnaswamy, S., and Zaslavsky, A., On-board Mining of Data Streams in Sensor Networks, Accepted as a chapter in the forthcoming book *Advanced Methods of Knowledge Discovery from Complex Data*, (Eds.) Sanghamitra Badyopadhyay, Ujjwal Maulik, Lawrence Holder and Diane Cook, Springer Verlag, to appear
- [20] Gaber, M. M., Zaslavsky, A., and Krishnaswamy, S., Towards an Adaptive Approach for Mining Data Streams in Resource Constrained Environments, the Proceedings of Sixth International Conference on Data Warehousing and Knowledge Discovery - Industry Track (DaWak 2004), Zaragoza, Spain, 30 August - 3 September, Lecture Notes in Computer Science (LNCS), Springer Verlag.

Real Time Scheduling for Embedded System

Neeraj Chauhan, Ranjana Sharma and Mohan Vishal Gupta

CMCA, TMU

Abstract—Scheduling is the process of deciding how to commit resources between a variety of possible tasks. In computer science scheduling is the method by which threads, process or data flows are given access to system resources (e.g. processor time, communications bandwidth). This paper introduces a new scheduling concept New Multi Level Feedback Queue (NMLFQ) algorithm. It's important to get a good response time with interactive tasks while keeping other tasks from starvation. In this research paper, we prove that a New version of the Multilevel Feedback queue algorithm is competitive for single machine system, in our opinion providing theoretical validation of the goodness of the idea that has proven effective in practice.

Keywords: Scheduling; Real-Time System

INTRODUCTION

A real-time system as: "Any system in which the time at which output is produced is significant. This is usually because the input corresponds to some movement in the physical world, and the output has to relate to that same movement.

The lag from input time to output time must be sufficiently small for acceptable timeliness". The correct behavior of a real-time system depends as much on the timing of computations as it does on the results produced by those computations.

Results delivered too late may be useless, or even harmful. Real-time systems are in widespread use and can be found in such application domains as industrial automation, process control, Communications, Command, Control, and multimedia.

The Main objective of this paper is to study the available task schedulers in practice.

ALGORITHM

Define Criteria. Examples:

Maximize CPU utilization under the constraint that response time ≤ 1 second

Maximize throughput so that turnaround time is (on average) linearly proportional to total execution time

New scheduler using the concept of multiple queuing has been implemented. This scheduler also considers an important parameter. priority which is a factor to be considered while developing scheduling policies for soft and firm real time systems.

In this scheduler multiple waiting queues have been implemented where each of the ready processes wait for the CPU cycle. The processes go into each of the queues based on their priority levels. 0-49-low priority, 50-99 medium priority and 100-149 high priority.

The high priority queues are given a greater CPU cycles than the lower priority ones hence avoiding starvation and allowing the higher priority processes more CPU cycles. The scheduling in the queues happens in a round robin fashion minimizing the possibilities of a very high priority process being ignored for long in the queue.

FEATURES OF REAL TIME SYSTEMS

- Multitasking: Provided through system calls.
- Priority based Scheduling: In principle of flexible concepts, but limited to number of priority levels.
- Ability to quickly respond to external interrupts.
- Basic mechanisms for process communication and synchronization.
- Small kernel and fast context switching.
- Support real time clock as internal time interface.

TASK STATES

The basic building block of RTOS is the task. Task is a segment of code which is treated by the system software (O/S) as a program unit which can be started, stopped, delayed, suspended, resumed and interrupted, Example:-Read a byte form serial buffer.

For each task they will have their own stack and registers. All the tasks share common data. RTOS will have its own data area.

These are THREE major states for a task.

a) Running b) Ready c) Blocked

Running task is the task under execution by the CPU. Only one task can be in the running condition. Ready task is ready to run. Only RTOS is holding it. Any number of tasks can be in ready state. Blocked task cannot run. It is waiting for something to happen. Any numbers of tasks can be in blocked state.

There can be other states like sleeping suspended, pended, waiting, dormant, delayed as shown in Figure 1. They are only minor variation of the blocked state.

- A task will be brought to running state from ready state by the scheduler of the RTOS. Similarly, a task will be sent to ready state from running state by RTOS when it wants to stop the current task in the middle and allow another task to run because of priority.
- A task will go from blocked state to ready state when it receives signal for which it has been waiting. It could be an external event, or the result of another task or the time signal from a timer and so on.
- A task will go from running to blocked state when it has to be suspended from running condition because it requires an information that is not available now and it cannot proceed further. It can happen due to various reasons and requirements.
- No task can come from blocked state to running state directly.
- No task can come to running state unless the scheduler allows it.

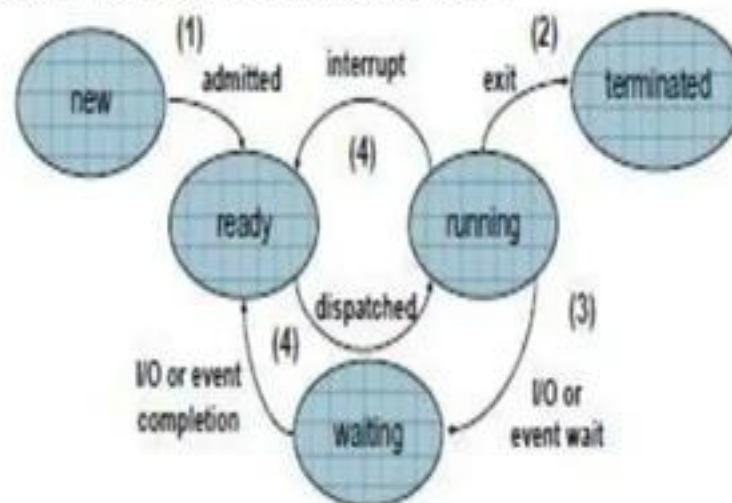


Fig. 1: Process States

STARVATION OF PROCESSES

In computer science, **starvation** is a multitasking-related problem, where a process is perpetually denied necessary resources. Without those resources, the program can never finish its task.

Starvation is similar in effect to deadlock. Two or more programs become deadlocked together, when each of them wait for a resource occupied by another program in the same set. On the other hand, one or more programs are in starvation, when each of them is waiting for resources that are occupied by programs, that may or may not be in the same set that are starving.

RELATED WORK

This section provides a review of the research related to our work for the implementation of NMLFQ. We describe each approach, its distinguishing features, and how it differs from generic scheduling mechanism.

Analysis for Real-Time Scheduling

A number of optimal scheduling algorithms exist for CPU loads of up to 100%. Optimality is defined as the algorithm's ability to find a feasible task ordering if such an ordering exists,

The Earliest Deadline First (EDF) and Least Laxity First (LLF) are two such optimal algorithms. When invoked, an EDF scheduler simply scans through all the tasks in the system and dispatches the one with the earliest deadline. The difference between the remaining execution time of a task and its remaining time to deadline is its laxity. The LLF scheduler dispatches the task with the smallest laxity.

CPU load (also known as processor utilization factor) is defined as:

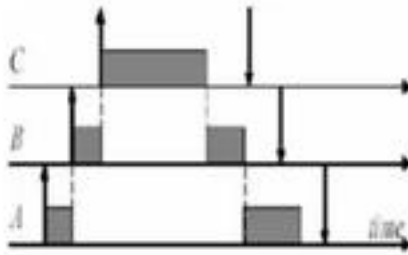


Fig. 2: Earliest Deadline First Algorithm

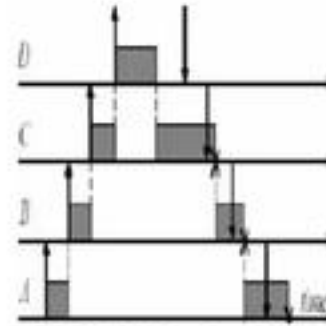


Fig. 3: EDF Domino Effect

Where for each of n concurrent tasks in the system, C_i is the task's computation time (also known as cost), and T_i is the task's period. The deadline for each task is the same as its period, i.e., the task must complete its computations before the arrival of its next instance. The processor utilization factor is used as a schedulability test – for $U \leq 1.0$, the task set under consideration can be scheduled using any of the optimal algorithms.

Hard real-time systems, by definition, operate below (or occasionally at) capacity. No overload can occur in such a system because it would cause missed deadlines.

An Extensive Literature Survey for Examples of Real-Time Operating Systems

Current real-time operating systems can be divided into three main categories.

1. Priority-based kernel for embedded applications,
2. Real-time extensions of timesharing operating systems, and
3. Hard real-time operating systems.

Scope and Limitation; Research Findings and Gaps

Though algorithms such as EDF produce optimal schedules during underload, they can produce schedules with catastrophic effects as load grows beyond capacity. Figure 3, shows one such case where EDF scheduling of a newly arrived task pushes all existing tasks beyond their respective deadlines.

The diagram shows task A arriving first (denoted by the up-arrow). It starts executing and is subsequently preempted by task B which has an earlier deadline (denoted by a down-arrow). Task B is in turn preempted by the arrival of task C with yet an earlier deadline. Task C then runs to completion, after which task B is resumed as depicted in Figure 2. Upon completion of task B, task A is resumed and runs to completion. If task D with an earlier deadline were to arrive (increasing the load beyond 100%), EDF would blindly schedule it, thereby pushing all other tasks beyond their deadlines, like falling dominos, as shown in Figure 3. This phenomenon is known as the domino effect.

As real-time systems enter overload, only a subset of all contending tasks can complete execution by their deadlines. The system therefore must shed load to a point at (or below) capacity where it properly can service task requests. It must shed load in a predictable way that avoids uncontrolled performance degradation.

EDF SCHEDULING

Formal analysis methods are available for EDF scheduling. In the simplest case the following assumptions are made: - only periodic tasks exist,

- Each task i has a period T_i ,
- Each task has a worst case execution time C_i ,
- Each task has a deadline D_i ,
- The deadline for each task is equal to the task period ($D_i = T_i$),
- No interprocess communication, and
- An "ideal" real-time kernel (context switching and clock interrupt handling takes zero time).

With these assumptions the following necessary and sufficient condition holds: If the utilization U of the system is not more than 100% then all deadlines will be met.

◆(4)

The utilization U determines the CPU load. The main advantage with EDF scheduling is that the processor can be fully utilized and still all deadlines can be met. More complex analysis exists that loosens some of the assumptions above.

RM Scheduling

Rate monotonic (RM) scheduling is a scheme for assigning priorities to tasks that guarantees that timing requirements are met when preemptive fixed priority scheduling is used. The scheme is based on the simple policy that priorities are set monotonically with task rate, i.e., a task with a shorter period is assigned a higher priority.

MOTIVATION, OBJECTIVES AND GOALS

Making sure that the scheduling strategy is good enough with the following criteria:

- Utilization / Efficiency: Keep the CPU busy 100% of the time with useful work
- Throughput: Maximize the number of jobs processed per hour.
- Turnaround time: From the time of submission to the time of completion.
- Waiting time: Sum of times spent in ready queue – Normally we must minimize this.
- Response Time: Time from submission till the first response is produced, minimize response time for interactive users.
- Fairness: make sure each process gets a fair share of the CPU

The Research Plan-Problem Statement

The aim of this research is to study the policy mechanisms of different real time schedulers in embedded systems domain, evaluation of performance of these mechanisms. In addition, to arrive at a common solution to simulate a new scheduling policy.

RESEARCH METHODOLOGY

The NMLFQ scheduling algorithm works by dividing the CPU time into *epochs*. In a single epoch, every process has a specified time quantum whose duration is computed when the epoch begins. In general, different processes have different time quantum durations. The time quantum value is the maximum CPU time portion assigned to the process in that epoch. When a process has exhausted its time quantum, it is preempted and replaced by another runnable process. Of course, a process can be selected several times from the scheduler in the same epoch, as long as its quantum has not been exhausted—for instance, if it suspends itself to wait for I/O, it preserves some of its time quantum and can be selected again during the same epoch.

The epoch ends when all runnable processes have exhausted their quantum; in this case, the scheduler algorithm recomputes the time-quantum durations of all processes and a new epoch begins.

Each process has a *base time quantum*: it is the time-quantum value assigned by the scheduler to the process if it has exhausted its quantum in the previous epoch. A new process always inherits the base time quantum of its parent. There are two kinds of priority:

Static Priority

This kind is assigned by the users to real-time processes and ranges from 1 to 99. It is never changed by the scheduler.

Dynamic Priority

This kind applies only to conventional processes; it is essentially the sum of the base time quantum (which is therefore also called the *base priority* of the process) and of the number of ticks of CPU time left to the process before its quantum expires in the current epoch.

Background Significance and Features of New Scheduler

Preemptive Scheduling is the best algorithm for embedded systems. Despite this, many well-known RTOS's (e.g. WinCE, embedded NT, Linux, and PharLap ETS) utilize priority time slicing. Under this algorithm, when a higher priority task becomes ready to run, it must wait until the end of the current time slice to be dispatched. Hence response time is governed by the granularity of the time slice. However, if the granularity is set too fine, the processor spends too much time thrashing -i.e. interrupting the current task to find out if a higher priority task is waiting. This pretty much precludes hard real time response without using an over-kill processor.

NMLFQ uses preemptive scheduling. This means that, as soon as a higher priority task becomes ready to run, it preempts the current task and runs as shown in Figure 4. For safety, NMLFQ does permit the current task to lock the scheduler if necessary (i.e. if it is in a critical section of code.) The programmer controls locking.

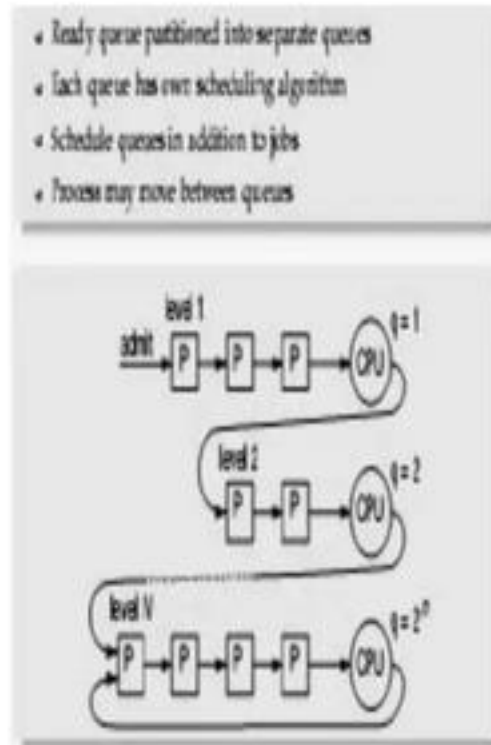


Fig. 4: Priority Levels of Newc Multilevel-Feedback-Queue Scheduler

Priority Levels: Some kernels (e.g. uC/OS) require each task to have a unique priority. This is limiting, because, within a group of equally important tasks, it is usually better for the task that has waited the longest, to run first. One task per priority level does not permit this. Allowing multiple tasks at the same priority level also permits round robin scheduling among those tasks. This is a good way to share resources equally among the lowest priority tasks in the system. NMLFQ also permits time slicing among the lowest priority tasks -this is even more equal.

Scheduler Locking: NMLFQ allows the current task to lock the scheduler. Many kernels do not provide this feature. Why is it important? With the addition of locking, there are three ways to protect access to a resource: (1) disabling interrupts, (2) semaphores, and (3) locking.

The first method is the only way to protect a resource shared between foreground and background [9]. However, it causes interrupt latency and should be used as little as possible. Semaphores are the traditional method to protect resources shared between tasks. Semaphores are resource-specific and do not add interrupt latency. However, they do cost a fair bit of processor overhead -typically on the order of 100 instructions to signal and test a semaphore. Hence using semaphores is inefficient for short, critical

DESIGNING THE NEW MULTILEVEL QUEUE SCHEDULER

As it was mentioned before, in MLFQ the operating system builds several separate queues as in Figure 5 and specifies the quantum for each queue. Generally in this method, all processes end in the mentioned queue and move out of system. In these methods, the number of queue and the quantum size are specified while the process is running, so the operating system has no role in controlling the number of queues and amount of each layer's quantum.

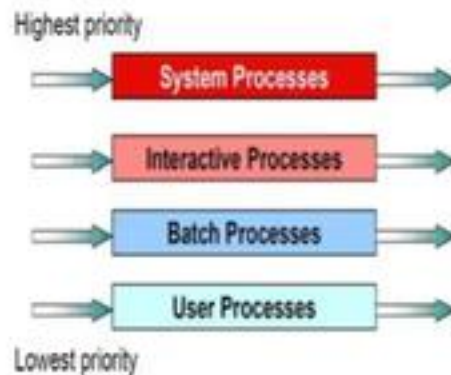


Fig. 5: Distinguishing Processes in Queues

The scheduler keeps a list of process queues. Every queue gets a priority assigned. Processes start in a given priority queue. Different OSs use other numbers corresponding with priorities.

Processes in queues with a higher priority get less CPU time, so a smaller 'time quantum' than processes in lower priority queues. In this way, interactive processes get less CPU time and computing processes more. This is depicted in Figure 8. But how do we know which processes are interactive and which are not? There is an easy solution: let processes move from queue to queue. When a process blocks before its time quantum is spent, the scheduler will increase its priority. So interactive processes, which normally just read some input and then quit, will automatically promote to higher priorities.

CONCLUDING REMARKS

The main contributions made by this research are:

The scheduling policies of the different schedulers are studied and their performance has been compared. The scheduler code is developed using C++ language on Linux operating system.

This algorithm uses a *New approach* for defining the optimized quantum of each queue and number of queues. The simulations show that the NMLFQ algorithm gives 10% better performance compared to Multi Level Queue real time scheduling with respect to response time and waiting time.

REFERENCES

- [1] Chih-Lin Hu, "On-Demand Real-Time Information Dissemination: A General Approach with Fairness, Productivity and Urgency", 21st International Conference on Advanced Information Networking and Applications.
- [2] Gauthier L, Yoo S and Jerraya A, "Automatic generation and targeting of application-specific operating systems and embedded systems software," IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems.
- [3] Ghosh S., Mosse D. and Melhem R., "Fault-Tolerant Rate Monotonic Scheduling", Journal of Real-Time Systems
- [4] Kenneth J. Duda and David R. Cheriton, "Borrowed-virtual-time (BVT) scheduling: supporting latency-sensitive threads in a general-purpose scheduler", Proceedings of the seventeenth ACM symposium on Operating systems.

Cloud Computing

R. Vijaya Baskaran

Associate Professor, MBA Department, Kristu Jayanti College of Management and Technology, Bangalore

Abstract—Cloud computing is seen by many as the next wave of information technology for individuals, companies and governments. This paper tries to address the issues faced like any new technology advancement, cloud computing also creates disruptive possibilities and potential risks and also the fact that cloud computing involves the aggregation of computing power, and more importantly, information, has become a source of increasing concern. Technology start-ups continue to proliferate as cloud computing enables them to avoid the substantial costs of selling and distributing software around the world. In fact, at present many venture capitalists were reluctant to fund any IT startup that did not plan to operate from the cloud. It is also observed that cloud computing is expected to have a undoubtedly substantial impact on a broad swath of industries outside of IT and telecom.

Keywords: cloud computing, virtualization, API, IaaS, PaaS, SaaS

INTRODUCTION

We observe the first paradigm shift from the mainframe era to PC era which resulted in comparable reduced investment on the cost of software and hardware leading to eventual user-friendly desktop applications leading to the explosion of PC. According to Forrester Research the amount of personal computers in the world crossed one billion already by 2008, and two billions - by 2015. The research also specifies that the achievement of first billion of personal computer in the world took 27 years, and the threshold in 2 billion will be overcome for five years. Out of this nearly 775 million will be in Russia, China, India and Brazil. The enabling technologies in the PC Era were networking, RDBMS and UI's. The came the second paradigm shift ushering in "The Internet Era" opened up web browsers, comprising of mobile and distributed workforce running data centers to host critical business applications. As on now 17 billion devices are connected to the internet as on 2012 and this will be 50 billion devices by 2020. The modern day IT Departments 70% of most IT budgets are spent on "Keeping the Lights On". IT Departments buy IT hardware & software and majority of software both proprietary and 3rd party are run within own Data Centers resulting in too much time spent on "Patching, Securing and Upgrading." The latest paradigm shift is taking place in Cloud Computing. Cloud Computing has evolved through a number of phases which include grid and utility computing, application service provision (ASP), and Software as a Service (SaaS). But the overarching concept of delivering computing resources through a global network is rooted in the sixties. The idea of an "intergalactic computer network" was introduced in the sixties but J.C.R. Licklider, who was responsible for enabling the development of ARPANET (Advanced Research Projects Agency Network) in 1969. His vision was for everyone on the globe to be interconnected and accessing programs and data at any site, from anywhere, a vision that sounds a lot like what we are calling cloud computing.

Other experts attribute the cloud concept to computer scientist John McCarthy who proposed the idea of computation being delivered as a public utility. Since the sixties, cloud computing has developed along a number of lines, with Web 2.0 being the most recent evolution. However the internet only started offering significant bandwidth in the nineties, cloud computing for the masses happened late. One of the first milestones for cloud computing was the arrival of Salesforce.com in 1999, which pioneered the concept of delivering enterprise applications via a simple website. The services firm paved the way for both specialist and mainstream software firms to deliver applications over the internet. The next development was Amazon Web Services in 2002, which provided a suite of cloud-based services including storage, computation and even human intelligence through the Amazon Mechanical Turk. Then in 2006, Amazon launched its Elastic Compute cloud (EC2) as a commercial web service that allows small companies and individuals to rent computers on which to run their own computer applications.

Another big milestone came in 2009, as Web 2.0 hit its stride, and Google and others started to offer browser-based enterprise applications, though services such as Google Apps. Other key factors that have enabled cloud computing to evolve include the maturing of virtualisation technology, the development of universal high-speed bandwidth, and universal software interoperability standards. Many IT professionals recognise the benefits cloud computing offers in terms of increased storage, flexibility and cost reduction. Experts seem to agree that cloud computing will ultimately transform today's computing landscape.

United States National Institute of Standards and Technology (NIST) Information Technology Laboratory defines as "Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

BENEFITS OF CLOUD COMPUTING

Cloud Computing is a general term used to describe a new class of network based computing that takes place over the Internet, basically a step on from Utility Computing. In other words, this is a collection/group of integrated and networked

hardware, software and Internet infrastructure (called a platform). Using the Internet for communication and transport provides hardware, software and networking services to clients. These platforms hide the complexity and details of the underlying infrastructure from users and applications by providing very simple graphical interface or API (Applications Programming Interface). In addition, the platform provides on demand services that are always on anywhere, anytime and any place. Pay for use and as needed, elastic (scale up and down in capacity and functionalities). The hardware and software services are available to the general public, enterprises, corporations and businesses markets.

CLLOUD COMPUTING MARKET AND PLAYERS

For developing world, there are few choices for either adopting foreign based cloud computing service or building cloud service infrastructure in-house, neither of such options is appealing to the poor world. Buying the cloud service from foreign land runs the latency concerns of data transfer bottlenecks and performance unpredictability (Armbrust, Fox et al. 2010). The business opportunity in cloud computing is expected to be enormous. The leading IT research and advisory firm Gartner (2008) predicts cloud computing to become as influential as e-business. In Gartner's (2010) recent report, they forecast worldwide cloud services market's revenue to surpass \$68.3 billion in 2010 and reach \$148.8 billion by 2014. IDC (2009) predicts worldwide IT spending on cloud services to reach \$42 billion by 2012. Companies in India will increase the adoption of cloud computing technology over the next five years. The total cloud market in India, currently at \$400 million, will reach \$4.5 billion by 2015. Of which private cloud adoption will dominate and account for \$3.5 billion in revenues, growing at over 60 per cent, according to a study. The study, 'private cloud landscape in India' was done by EMC Corporation, a provider of IT service and solutions, and Zinnov Management Consulting, a management consulting firm.

The study says that private cloud market will create one lakh jobs by 2015 against 10,000 now. Today, companies are under-skilled in addressing cloud computing implementations. It recommends companies to invest in competency building internally to take advantage of cloud computing technologies. The study estimates that the skilling and re-skilling market in India will grow fast as cloud computing becomes critical to IT strategies. Leading public and private educational institutions, along with IT enterprises are expected to play a key role in enhancing workforce skills to match the industry demand for cloud computing.

The growth in cloud computing market is attributed to the increased maturity of Indian enterprises towards cloud computing and the chief executive officer / chief information officer mandate for an enterprise-wide cloud strategy. It adds that with the overall environment of cloud adoption fast evolving in India, cloud computing will account for a significant share in the total IT spend of small, medium and large enterprises.

The study notes that IT/ITeS, telecom, BFSI, manufacturing and government sectors will contribute nearly 78 per cent of the total cloud market, according to Pari Natarajan, Chief Executive Officer, Zinnov Management Consulting.

TYPES OF CLOUD COMPUTING AND MODELS

Cloud computing services can enable an enterprise to expand its infrastructure, add capacity on demand, or outsource the whole infrastructure, resulting in greater flexibility, a wider choice of computing resources thereby resulting in significant cost savings. Cloud computing has the potential to benefit organizations, whole industries, and even entire economies by:

Dramatically accelerating the way companies create new products and services, in part through enabling product development professionals around the world to collaborate more effectively and access more powerful and economical computer resources.

- Increasing the ability of organizations to mine their data for important trend information, such as customers' changing needs and competitors moves in the marketplace.
- Leveling the playing field between large and small companies by giving companies of all sizes access to information technology that previously was affordable for only the largest of companies.
- Helping emerging economies leapfrog to higher levels of technological development by providing more immediate and affordable access to next generation applications, tools, and infrastructure.

From a hardware point of view, the essentials of Cloud Computing are,

- There is an infinite computing resource available on demand, thereby eliminating the need for Cloud Computing users to plan far ahead for provisioning.
- The elimination of an up-front commitment by Cloud users, thereby allowing companies to start small and increase hardware resources only when increase in their needs.
- The ability to pay for use of computing resources on a short-term basis as needed (e.g., processors by the hour and storage by the day) and release them as needed, thereby rewarding conservation by letting machines and storage go when they are no longer useful.
- The type of models are 1. Acquisition Model: Based on purchasing of services
- 2. Business Model: Based on pay for use 3. Access Model: Over the Internet to ANY device 4. Technical Model: Scalable, elastic, dynamic, multi-tenant, & sharable

Now we prove that if we are able to find a subsuming HOM in particular a strongly subsuming HOM, it will kill all the FOM's from which it is constructed thereby reducing the number of test cases without loss of test case effectiveness.

We take simple example to find largest of 3 numbers a, b and c. Our program takes as input 3 numbers and as output it gives the largest of these numbers.

```
Original_program
#include<stdio.h>
#include<conio.h>
void main ()
{int a,b,c;
clrscr();
printf("ENTER THE 3 NUMBERS");
scanf("%d%d%d",&a,&b,&c);
if((a>b) &&(a>c))
printf("A IS GREATEST");
else if ((b>a) &&(b>c))
printf("B IS GREATEST");
else if ((c>a) && (c>b))
printf("C IS GREATEST");
else printf (" WRONG RESULT");}
```

We create First Order Mutant FOM1 from the Original_program by changing a> b to a<b
FROM1

```
if((a<b) &&(a>c))
printf("A IS GREATEST");
else if ((b>a) &&(b>c))
printf("B IS GREATEST");
else if ((c>a) && (c>b))
printf("C IS GREATEST");
else printf(" WRONG RESULT");
```

We create another First Order Mutant FOM2
from the Original_program by changing a> c to a<c
FOM2

```
if((a>b) &&(a<c))
printf("A IS GREATEST");
else if ((b>a) &&(b>c))
printf("B IS GREATEST");else if ((c>a) && (c>b))
printf("C IS GREATEST");
else printf(" WRONG RESULT");
```

We create Higher order mutant HOM from First order mutant FOM1 and FOM2 by changing a> b to a<b and a>c to a<c. This differs from Original_program by 2 faults.

HOM

```
if((a<b) &&(a<c))
printf("A IS GREATEST");
else if ((b>a) &&(b>c))
printf("B IS GREATEST");
else if ((c>a) && (c>b))
printf("C IS GREATEST");
else printf(" WRONG RESULT");
```

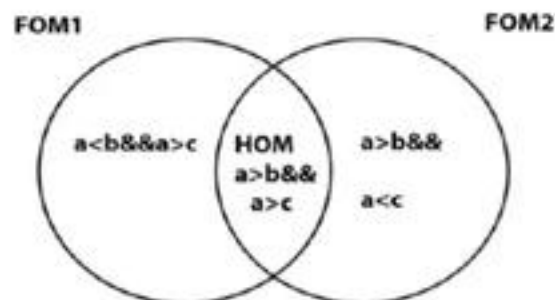


Fig. 2

Cloud services can be used in a private, public, community/managed or hybrid setting (Cloud Security Alliance 2009). Privately-hosted cloud services are generally considered a safer but more costly option than services using a shared-tenancy setting (i.e. data from different clients stored on a single physical machine). In line with this, the US Government recently announced an initiative 'to offer cloud-based services that are hosted in private data centers and which could be used to handle more sensitive data' (McMillan 2009: np). In a community/managed setting, tenancy can either be single (dedicated) or shared and the IT infrastructure is either managed by the organisation or a third-party cloud service provider. The main difference between hybrid cloud services and other cloud services is that the former 'is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability' (Mell & Grance 2009: 13). Cloud architectures can be broadly categorised into (see Appendix -I)

Infrastructure as a Service (IaaS) is the foundation of cloud services. It provides clients with access to server hardware, storage, bandwidth and other fundamental computing resources. For example, Amazon EC2 allows individuals and businesses to rent machines preconfigured with selected operating systems on which to run their own applications.

Platform as a Service (PaaS) builds upon IaaS and provides clients with access to the basic operating software and optional services to develop and use software applications (eg database access and payment service) without the need to buy and manage the underlying computing infrastructure. For example, Google App Engine allows clients to run their web applications (ie software that can be accessed using a web browser such as Internet Explorer over the internet) on Google's infrastructure.

Software as a Service (SaaS), builds upon the underlying IaaS and PaaS provides clients with integrated access to software applications. For example, Oracle SaaS Platform allows independent software vendors to build, deploy and manage SaaS and cloud-based applications using a licensing economic model. Here, users purchase a license and support for components of the Oracle SaaS Platform on a monthly basis.

OPPORTUNITIES AND CHALLENGES

- It enables services to be used without any understanding of their infrastructure.
- Cloud computing works using economies of scale by potentially lowering the outlay expense for start up companies, as they would no longer need to buy their own software or servers.
- Cost would be by on-demand pricing.
- Vendors and Service providers claim costs by establishing an ongoing revenue stream.
- Data and services are stored remotely but accessible from "anywhere".
- In parallel there has been backlash against cloud computing:
- Use of cloud computing means dependence on others and that could possibly limit flexibility and innovation:
- The others are likely become the bigger Internet companies like Google and IBM, who may monopolise the market.
- Another argument is that this use of supercomputers is a return to the time of mainframe computing
- Security could prove to be a great bottleneck
- It is still unclear how safe out-sourced data is and when using these services ownership of data is not always clear.

A successful example illustrated in the power of using computing in the cloud in pharmaceutical industry. Scientists at a drug company used Amazon's cloud services to dramatically shrink the time to analyse data and determine how to treat diseases. They cut the time to analyse a large data set from 140 days (on a desktop computer) to six days (in the cloud). Another example comes from the manufacturing sector, where cloud computing is viewed as a superior tool to link factory information systems to those of suppliers, distributors and customers, resulting in fewer supply chain disruptions. And media companies imagine cloud computing opening up vast new distribution channels new outlets for movies, newspapers, magazines, music and other forms of information and entertainment that can be digitized and delivered through the cloud.

ADVANTAGES & DISADVANTAGES OF CLOUD COMPUTING

Benefits Cloud computing provides a scalable online environment which facilitates the ability to handle an increased volume of work without impacting on the performance of the system. Cloud computing also offers significant computing capability and economy of scale that might not otherwise be affordable to businesses, especially small and medium enterprises (SMEs) that may not have the financial and human resources to invest in IT infrastructure.

Advantages

Lower Computer Costs

- No need for a high-powered and high-priced computer to run cloud computing's web-based applications.
- Since applications are run in the cloud, not on the desktop PC, desktop PC does not need that much processing power or hard disk space demanded by traditional desktop software.
- While using web-based applications, PC can be less expensive, with a smaller hard disk, less memory, more efficient processor does not even need a CD or DVD drive, as no software programs have to be loaded and no document files need to be saved.

Improved Performance

- With few large programs hogging your computer's memory, you will see better performance from your PC.
- Computers in a cloud computing system boot and run faster because they have fewer programs and processes loaded into memory

Reduced Software Costs

- Instead of purchasing expensive software applications, most cloud computing applications today, such as the Google Docs suite, are totally free. That is a lot better than paying Rs.10000+ for similar Microsoft Office software - which alone may be justification for switching to cloud applications.
- Instant software updates is yet another advantage to cloud computing is that no longer faced with choosing between obsolete software and high upgrade costs. When the application is web-based, updates happen automatically.
- When access a web-based application, you get the latest version - without needing to pay for or download an upgrade.

Improved Document Format Compatibility

- There are potentially no format incompatibilities when everyone is sharing documents and applications in the cloud. When documents are created on user machine being compatible with other users' applications or operating systems.

Unlimited Storage Capacity

- Cloud computing offers virtually limitless storage. Whatever need to stored canbe done.

Increased Data Reliability

- Unlike desktop computing, in which if a hard disk crashes and destroy all your valuable data, a computer crashing in the cloud should not affect the storage of data, that is even a personal computer crashes, all data is still out there in the cloud, still accessible.

Universal Document Access

- Documents stay in the cloud, canbe accessed anywhere with a computer and an Internet connection. The cloud always hosts the latest version of documents enabling easier group collaboration which leads directly to better collaboration in documents sharing.
- Many users do this as it is an important advantages of cloud computing - multiple users can collaborate easily on documents and projects.

DISADVANTAGES OF CLOUD COMPUTING

- Always requires Internet connection with high speed and more bandwidth, often a low-speed Internet connection, normally found with dial-up services, makes cloud computing painful at best and often impossible.
- Web-based applications require a lot of bandwidth to download, as do large documents.
- Labouring with a low-speed dial-up connection, it might take seemingly forever just to change from page to page in a document.
- Features might be limitedtoday many web-based applications simply are not as full-featured as their desktop-based applications. For example, you can do a lot more with Microsoft PowerPoint than with Google Presentation's web-based offering. The basics are similar, but the cloud application lacks many of PowerPoint's advanced features.
- Stored data might not be secure:
- Stored data can be lost. In principle, data stored in the cloud is always safe, replicated across multiple machines. But on the off chance if data goes missing, no physical or local backup.
- Each cloud systems use different protocols and different APIs. Making it not be possible to run applications between cloud based systems. Amazon has created its own DB system (not SQL 92), and workflow system (many popular workflow systems out there) – so normal applications will have to be adapted to execute on these platforms.

IMPEDIMENTS TO BROADER CLOUD COMPUTING ADOPTION

Governments everywhere are also anxious to leverage the cloud to make public information accessible to citizens at a low cost. Examples include providing information about land ownership and allowing companies to generate customized applications using that data. In the UK, for example, cloud-based applications are used to inform governments about the

need to repair potholes. The US government's chief information officer, Vivek Kundra, said cloud computing "allows us to create a government that is more transparent – so that government is not practiced behind closed doors, but in the public square. For European Commission it is, "Cloud computing facilitates public procurement among different member states' administrations and enables small & medium enterprises to gain access to public services. Whereas in Japan a nation-wide "Kasumigaseki Cloud" is being developed to enable various ministries to collaborate. At the local level, the "Jichitai Cloud" is being built to provide interoperability among local governments. Providers of cloud services have their own set of worries can be grouped into three categories: data governance, outdated laws, and users' lack of understanding of cloud computing. Under data governance, survey participants most commonly cited the burden of privacy requirements as a "very serious" issue. Additionally, limitations to letting users' data cross country or continental borders were another big cloud provider concern. The more regulations against cross-border data transfers, the more data centers a cloud vendor must build (and, consequently, the less economical the service becomes for the provider). Issues about data ownership were also found to be significant. There is very blurry definition of ownership. Does it mean right to access? Right to download? Or right to own?" Perhaps not surprisingly, the nascent cloud industry views government regulations as complex and inconsistent. The last group of significant concerns for cloud providers revolves around customer confusion the lack of customer understanding of exactly what "cloud" means.

CONCLUSION

Cloud computing isn't new technology; it's a newly evolved delivery model. The key point is that cloud computing focuses on the end users and their abilities to do what they want to do, singularly or in communities, without the need for specialized IT support. The technology layer is abstracted, or hidden, and is simply represented by a drawing of a "cloud." Cloud technology will continue to evolve and expand. One of the biggest advances will be the availability of software that allows companies to fully manage their own private and public clouds. Similar tools used by Amazon EC2 will be available to the general market to install and use. Different approaches are needed to accelerate cloud usage in emerging markets. Major investments need to be made in telecommunications infrastructure to provide access to major cloud data centers. Cloud computing has several positives: disaster recovery, consolidation, test and development, ease of application and workload delivery, among others. It will be up to developers and admins to understand how to reap these benefits and how each technology will interact with a company's existing IT infrastructure. IT managers and administrators will need to update their skill sets to fully understand how data is traveling within the cloud. And even though cloud computing shares characteristics with existing environments, it has very stark differences. Cloud managers will need to have a better grasp of distributed computing, how data lives in the cloud and how to best use cloud technologies so they benefit the organization. Cloud marketing begins to differentiate its message recognising that the 'go to the cloud' messaging for enterprises is vastly different to the message for start-ups, web shops, development shops and small business. Whilst the enterprise will move individual workloads to the cloud, the more large scale cloud adoption by enterprises will continue to slow as the realization that the scale of these transformations will have deep impacts on business models, processes and people. The hype such as 'everything will be in the cloud by 2015' will be replaced with 'Cloud is here and stay and will be more about a business transformation over the next 5+ years'. This will lead to an increased focus on professional services as the cloud adoption process for the enterprise becomes a discussion on long-term 'roadmap' and slow and safe transitions touching everything from project management, business process improvement, Enterprise Architecture and Business Analysis.

REFERENCES

- [1] Forrester Research 2011
- [2] <www.amazon.com>
- [3] <<http://www.pwc.com/us/en/technology-forecast/2010/issue4>>
- [4] <upcon11.com/pwc>
- [5] <www.exordia.co.za/TechnicalServices/Pages/default.aspx>
- [6] <www.microsoft.com/Private_Cloud7 <<http://www.pwc.com/us/en/issues/cloud-computing/risks.html>>

APPENDIX

Use Cases Vs Service Levels			
	SaaS	PaaS	IaaS
Public Cloud Services	Google Apps, Zoho, MS Office Web, Facebook	Google App Engine, Facebook Platform, Gigaspaces	Amazon Web Services (AWS), Sun, vCloud Express
Outsourced Cloud Services	Salesforce.com	Force.com, 3Tera, Gigaspaces	Terremark, Savvis, Rackspace, AWS, ATT
Cloud Enhanced Enterprise Services	IBM Cloud Analytics	Microsoft Azure	AWS Virtual Private Cloud
Private Cloud Services	Internal applications billed by usage	Appistry, Gigaspaces	IBM, HP, VMware vCloud
Shared Cloud Services	Commerce Hubs	Cross –Enterprise BPM Tools for Cloud	IBM

APPENDIX-I

Use Cases Vs Service Levels	SaaS	PaaS	IaaS
Public Cloud Services	Google Apps, Zoho, MS Office Web, Facebook	Google App Engine, Facebook Platform, Gigaspaces	Amazon Web Services (AWS), Sun, vCloud Express
Outsourced Cloud Services	Salesforce.com	Force.com, 3Tera, Gigaspaces	Terremark, Savvis, Rackspace, AWS, ATT
Cloud Enhanced Enterprise Services	IBM Cloud Analytics	Microsoft Azure	AWS Virtual Private Cloud
Private Cloud Services	Internal applications billed by usage	Appistry, Gigaspaces	IBM, HP, VMware vCloud
Shared Cloud Services	Commerce Hubs	Cross –Enterprise BPM Tools for Cloud	IBM

APPENDIX-II

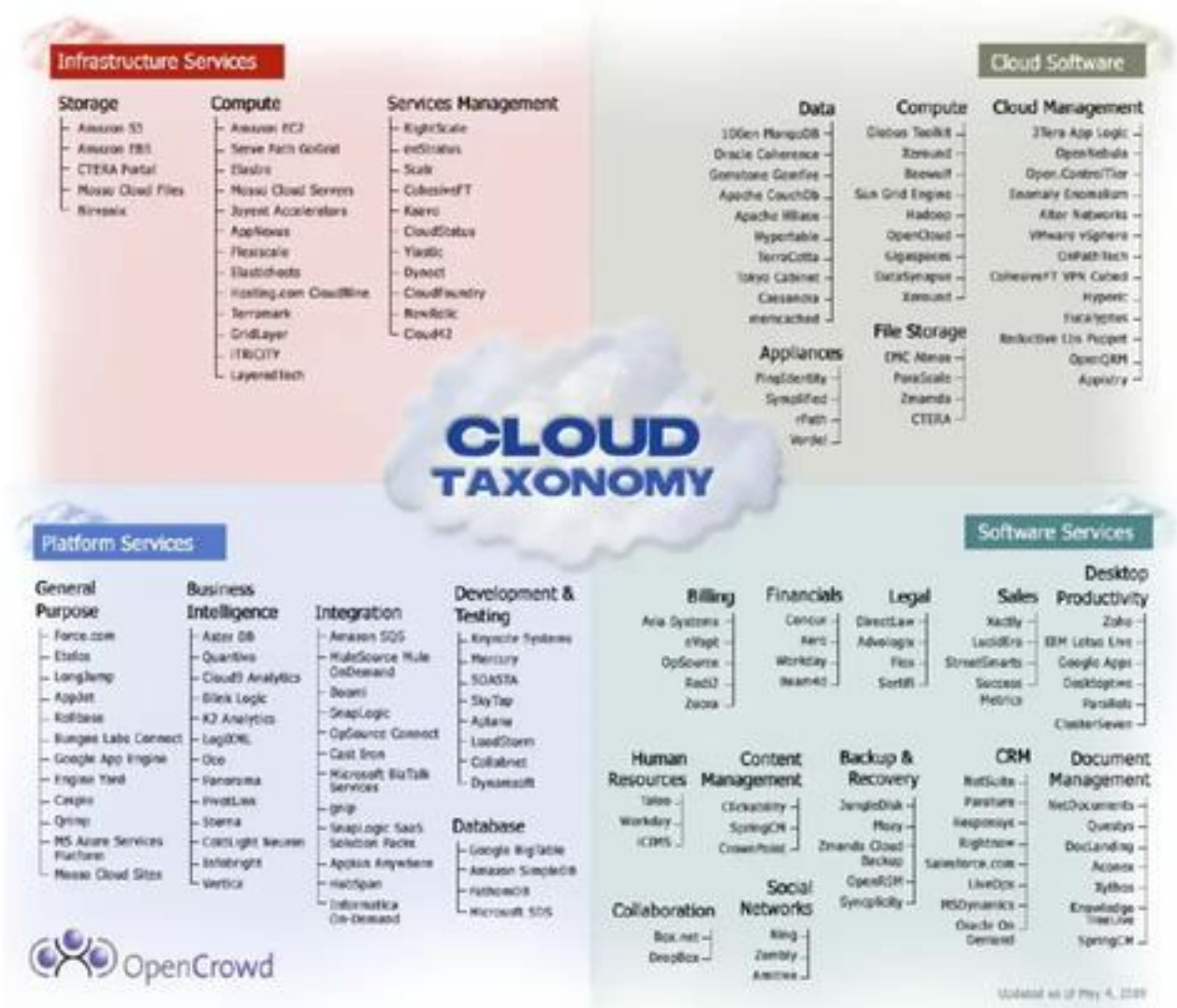


Fig. 1

A Comparative Study of Automatic Face Recognition Systems

Anand Sharma¹, Pradeep Kumar Sharma²,
Nidhidh Singh³ and Lalit Mohan Gupta⁴

¹Assoc. Prof., HOD CS/ IT Dept., ACET, Aligarh

²Asst. Prof., CS/ IT Dept., VCTM, Aligarh

³Asst. Prof., CS/ IT Dept., VIT, Aligarh

⁴Assoc. Prof., HOD CS/ IT Dept., VCTM, Aligarh

Abstract—Face recognition system has been evolving as convenient biometric mode for human authentication. Face recognition is the problem of searching a face in the reference database to find a face that matches a given face. The purpose is to find face in the database, which has highest similarity with a given face. We implemented four face recognition systems based on Principal Component Analysis (PCA), Discrete Cosine Transform (DCT), Template Matching using Correlation and Partitioned Iterative Function System (PIFS). We experiment with the standard database namely Olivetti Research Laboratory face database. We find that DCT based face recognition outperforms

Keyword: Face Recognition, PCA, DCT, Template Matching, LFA, PIFS, ORL

INTRODUCTION

Facial recognition is still in the research and development phase, several face recognition algorithms have been developed and some have been commercialized for applications such as access control and surveillance. Several studies have been reported in the last 10 years [1, 2, 3, 7] that compare those algorithms. Research organizations are working on the development of more accurate and reliable systems. The goal is to find which face recognition techniques performs better in terms of recognition rate.

BACKGROUND WORK ON FACE RECOGNITION SYSTEMS

Some background studies are discussed below on the analysis of face recognition system. PCA also known as Eigen face method, In PCA method the images are projected onto the facial value so called eigenspace [5, 8]. PCA approach reduces the dimension of the data by means of data compression basics [2] and reveals the most effective low dimensional structure of facial patterns.

The representations of Local feature analysis are sparse-distributed and, hence, are effectively low-dimensional and retain all the advantages of the compact representations of the PCA

Model Matching methods of face recognition (like Hidden Markov Model (HMM) [10]) train a model for every person during model learning and choose the best matching model, given a query image.

Recognition technique formulated on PIFS [6] makes use of the fact that human face shows region-wise (fractal) self-similarity, which is utilized for encoding the face to generate the PIFS code. Recognition is performed by matching these PIFS codes. In [10] the face recognition system based on partitioned Iterated Function System is proposed, in which face recognition based on PIFS representation and matching is carried out in the PIFS code domain.

DCT is used to extract the features and feature vector from images. This feature vector contains low to mid frequency DCT coefficients, as these are the ones containing highest information [4]. In [9] illumination normalization is proposed by exploiting the correlation of DCT low-frequency coefficients to illumination variations.

ORL FACE DATABASE

The ORL face database was originally published by Cambridge University. ORL database contains a set of faces taken between April 1992 and April 1994 at the Olivetti Research Laboratory in Cambridge, U.K. [11]. Since 1994, ORL has been used to benchmark many face identification systems. An overview of the ORL face database is shown in Figure 3.1. All the images are against a dark homogeneous background with the subjects in an up-right, frontal position, with tolerance for some tilting and rotation of up to about 20 degrees. The images are in bitmap, grayscale with resolution of 92x 112 pixels. Also, there is variation in images of same person shown in Figure 3.2

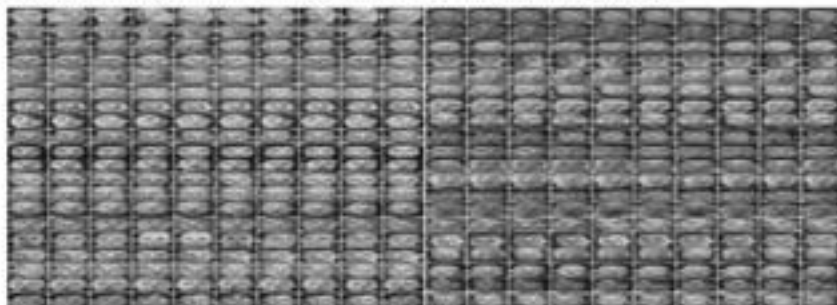


Fig. 3.1: Olivetti Research Lab Faces Database Overview



Fig. 3.2: Set of 10 images of the same person

STEP OF IMPLEMENTATION OF INDIVIDUAL TECHNIQUES AND INTERMEDIATE RESULTS

In this section we have discussed implementation steps and also show the corresponding results in the given subsection of the following face recognition techniques: PCA, DCT, Template matching using correlation and PIFS. For implementing face recognition system based on the above techniques, we follow the following three steps: 1: Face preprocessing, 2: Feature vector extraction, 3: Recognition step.

PCA

Figure 4.1 shows the block diagram of the implementation process of the above discuss face recognition approaches. Before we proceed, we have to perform some preprocessing tasks. In this step, we are resizing the images because original images have more values by which eigenface computation becomes complex. ORL face database images size is 92×112. After resizing the face image size is 64×64 as shown in Figure 3.4

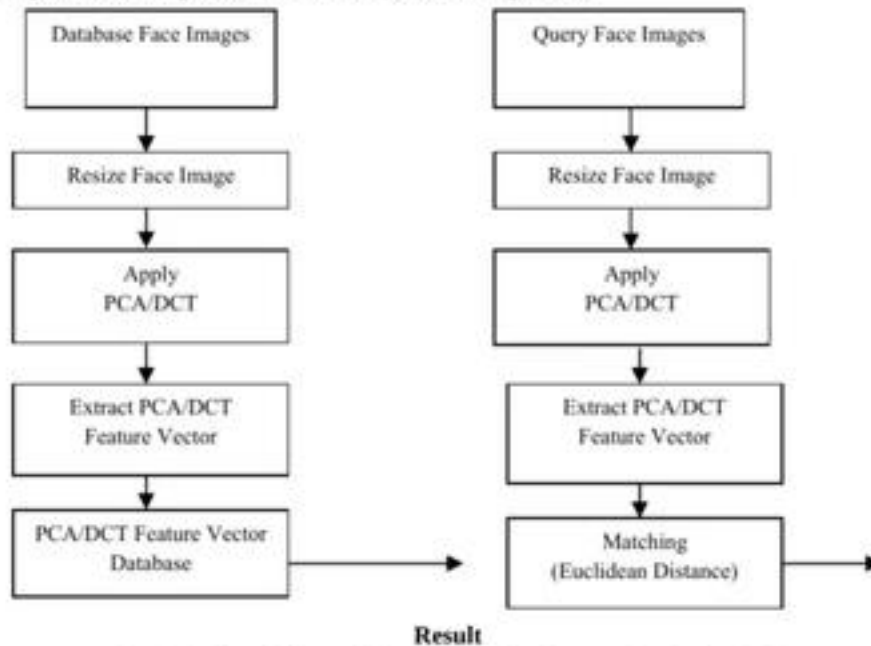


Fig. 4.1: Flow Chart of face Recognition System Based on PCA



Fig. 4.2: Resizing of image

In feature vector extraction step we find the eigenvectors with the highest eigenvalue. These eigenvectors can be thought of as a set of features that together characterize the variation between face images. Based on this idea, the procedure is described as follows:

1. Let us assume we have a reference database of face images, $\Gamma_1, \Gamma_2, \Gamma_3, \dots, \Gamma_M$ with each image has a dimension (64, 64) after preprocessing task. M depends on the number of persons and the images of per person, e.g. we take 25 persons and 10 pose of each persons so that M equal to the 250. Convert each image (N×N) into a column vector of N^2 rows, where N^2 is 64×64. Thus, the new representation of the database images set is a matrix, X of dimension (4096×M).
2. The mean face is calculated by taking the pixel-by-pixel average of all the faces in the face database.

$$\Psi = \frac{1}{M} \sum_{n=1}^M \Gamma_n \quad (4.1)$$

Find the mean face column vector by

1. Calculate Difference matrix, is built by subtracting the mean face by each face in training set and the set of column vectors Φ_i forms a matrix known as difference matrix.

$$\forall i = 1, 2, \dots, M \quad (4.2)$$

$$\Phi_i = \Gamma_i - \Psi$$

$$\text{Calculate the Covariance Matrix } C = \frac{1}{M} \sum_{n=1}^M \Phi_n \Phi_n^T \quad (4.3)$$

2. The covariance matrix stores the difference images in a matrix form, thus capturing the deviations of the face images from the mean face. The covariance matrix represents the variations across the faces of the face database.
3. The matrix C has a dimension of $N^2 \times N^2$ and determining N^2 eigenvectors and eigen values from this matrix is unwieldy. To handle this problem, Turk and Pentland proposed the following solution.
4. Following this method, we construct a matrix $L = A^T A$ of M by M dimensions and find M eigenvectors, v_i of L . The M eigenvectors of the covariance matrix can be obtained by finding Av_i and the corresponding eigenvalues allow us to rank the eigenvectors according to their significance. Thus we find the top N eigenfaces according to their eigenvalues. Eigenfaces with higher Eigenvalue represents features with the greater amount of changes across the whole image set.

$$f_i = u_k^T (\Gamma_i - \Psi)$$

$$1 \leq k \leq M, 1 \leq i \leq M \quad (4.4)$$

5. The least minimum Euclidean distance gives closest match with the query face image.

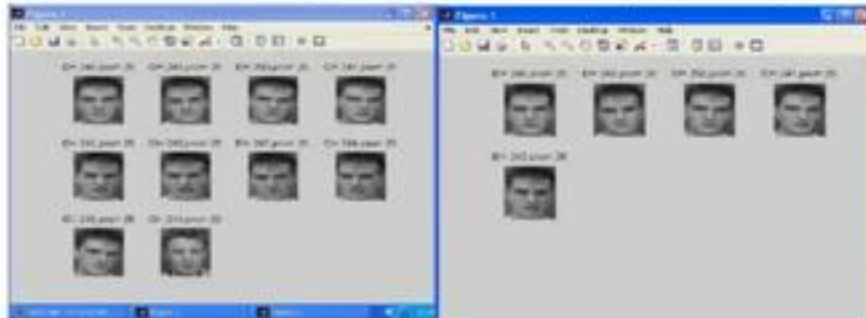


Fig. 4.3: PCA: Top five and ten close matches: the first image is the query image

DCT

DCT is used to extract the features from images. To get the feature vector representing a face, its DCT coefficients are determined and only a subset of the DCT coefficients is retained. To recognize a particular input query face, the system compares the face's feature vector to the feature vector of the database faces using Euclidean Distance nearest neighbor classifier [4]. If the feature vector of a database face is f and that of input query face image is v , then the Euclidean distance between the two is:

$$d = \sqrt{\{(f_0 - v_0)^2 + (f_1 - v_1)^2 + \dots + (f_{M-1} - v_{M-1})^2\}} \quad (4.5)$$

Where

$$v = [v_0 v_1 \dots v_{M-1}]^T \quad f = [f_0 f_1 \dots f_{M-1}]^T$$

In this work, 2-D DCT is used to extract features from face images.

Mathematically, 1-D DCT for length N is represented as-

$$C(u) = \alpha(u) \sum_{x=0}^{N-1} f(x) \cos \left[\frac{\pi(2x+1)u}{2N} \right] \quad (4.6)$$

For $u = 0, 1, 2, \dots, N-1$.

The inverse transform is defined as-

$$f(x) = \sum_{u=0}^{N-1} \alpha(u) C(u) \cos \left[\frac{\pi(2x+1)u}{2N} \right] \quad (4.7)$$

For

$x=0, 1, 2, \dots, N-1$. In both equations $\alpha(u)$ is defined as:

$$\alpha(u) = \begin{cases} \sqrt{1/N} & , \{u = 0\} \\ \sqrt{2/N} & , \{u = 1, 2, \dots, N-1\} \end{cases}$$

The 2-D DCT is extension of the 1-D and is given by-

$$C(u, v) = \alpha(u)\alpha(v) \sum_{x=0}^{N-1} \sum_{y=0}^{N-1} f(x, y) \cos \left[\frac{\pi(2x+1)u}{2N} \right] \cos \left[\frac{\pi(2y+1)v}{2N} \right] \quad (4.8)$$

For $u, v = 0, 1, 2, \dots, N-1$.

The inverse transform is defined as-

$$f(x, y) = \sum_{u=0}^{N-1} \sum_{v=0}^{N-1} \alpha(u)\alpha(v) C(u, v) \cos \left[\frac{\pi(2x+1)u}{2N} \right] \cos \left[\frac{\pi(2y+1)v}{2N} \right] \quad (4.9)$$

$$\alpha(u) = \begin{cases} \sqrt{1/N} & , \{u = 0\} \\ \sqrt{2/N} & , \{u = 1, 2, \dots, N-1\} \end{cases} \quad \text{For } x, y = 0, 1, 2, \dots, N-1.$$

$$\alpha(v) = \begin{cases} \sqrt{1/N} & , \{v = 0\} \\ \sqrt{2/N} & , \{v = 1, 2, \dots, N-1\} \end{cases}$$

In this work, 2D DCT has been used to extract feature vectors from face image. Since, DCT has a property of accumulating image information in just few coefficients instead of using whole (say 64x64 pixel) image only 12x12 DCT coefficients are taken.



Fig. 4.4: DCT: Top five and ten Close Matches: the First Image is the Query Image

TEMPLATE MATCHING

Correlation is important tool in image processing and template matching. The correlation between two signals (cross correlation) is a standard approach to feature detection as well as a building block for more sophisticated recognition techniques.

The cross correlation coefficient between two windows f and g of size $N \times N$ is defined by:

$$r = \frac{\sum_{x=0}^{N-1} \sum_{y=0}^{N-1} f(x,y)g(x,y)}{\left\{ \sum_{x=0}^{N-1} \sum_{y=0}^{N-1} f(x,y)^2 \sum_{x=0}^{N-1} \sum_{y=0}^{N-1} g(x,y)^2 \right\}^{0.5}} \quad (4.10)$$

Where $f(x,y)$ and $g(x,y)$ are the pixel values at location (x,y) of f and g , respectively and 'r' is correlation coefficient $0 \leq r \leq 1$. When the search area is $M \times M$ and that of the template size is $N \times N$ ($N < M$), we have to compute correlation coefficient 'r' for every shift position $(M - N + 1)^2$.

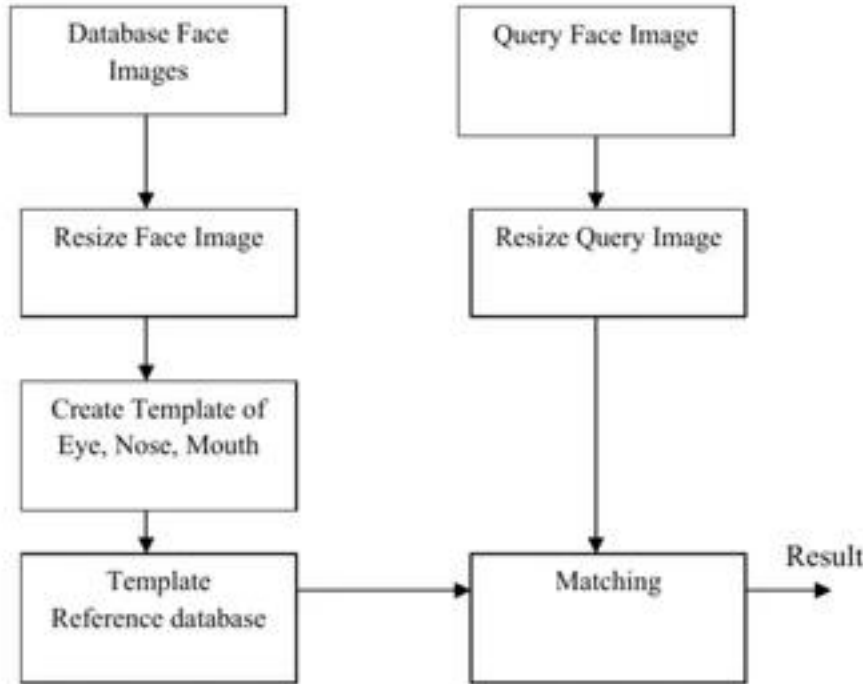


Fig. 4.5 Flow Chart of Face Recognition System Based on Template Matching



Fig. 4.6: Template Matching: Top Five and ten close Matches: the first Image is the Query Image

PIFS

All images of natural or man made objects show region wise self similarity although they may not be globally self similar. Such images can be represented by PIFS.

PIFS is collection of transformations w_i . Each transformation w_i is applied to a part of image, w_i can be written as:

$$w_i \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} a & b & 0 \\ c & d & 0 \\ 0 & 0 & s \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} + \begin{pmatrix} e \\ f \\ o \end{pmatrix} \quad (4.11)$$

In PIFS fractal image coding the original image f of $N \times N$ is partitioned into non-overlapping regions called the range block R with size $B \times B$ (B usually takes 4, 8 etc.). Domain blocks D are extracted from original image. Each domain block is of size $2B \times 2B$ which should be larger than that of the range block to fulfill contractive requirement. The

pool of domains, $\{D_j\}$ ($j=1,2,\dots,n$) is obtained by sliding a window, is size equal to $2B \times 2B$, in a single pixel step across the original image from the left to right and from the bottom to the top.

The domain pool $\{D_i\}$ and contractive affine transformation set $\{w_i\}$ are defined for the range block R_i , then the encoding process starts, applying one of the self-symmetry transformations and finally completing a shift of intensity to match the range block most approximately by following error calculation:

$$E(R, D) = \sum_{i=1}^n (\alpha D + o - R)^2 \tag{4.12}$$

$$o = \frac{1}{n} \left(\sum_{i=1}^n r_i - \sum_{i=1}^n d_i \right) \tag{4.13}$$

Where α is the contrast scaling factor and O is the luminance shift using the formulae

$$\alpha = \frac{n \sum_{i=1}^n d_i r_i - \sum_{i=1}^n d_i \sum_{i=1}^n r_i}{n \sum_{i=1}^n d_i^2 - \left(\sum_{i=1}^n d_i \right)^2} \tag{4.15}$$

And finally find the Euclidean distance between the query PIFS code and reference database PIFS code, minimum distance gives the closet match

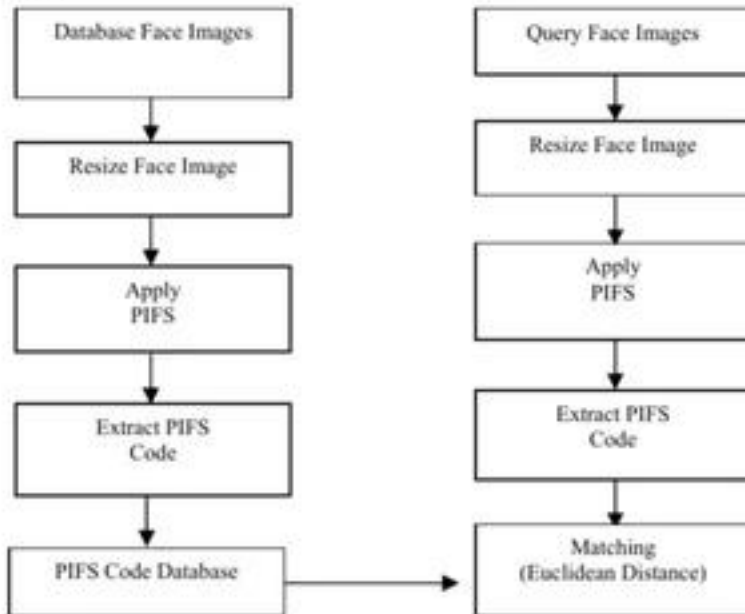


Fig. 4.7: Flow Chart of Face Recognition System based on PIFS



Fig. 4.7: PIFS: Top Five and ten Close Matches: the First Image is the Query Image

Table 1: Test Cases which kill FOM1, FOM2, HOM

Mutant	Test Case	Original_program Result	Mutant Result
FOM1	a>b && a>c	A is Greatest	Wrong Result
	a<b && a>c	B is Greatest	A is Greatest
FOM2	a>b && a>c	A is Greatest	Wrong Result
	a>b && a<c	C is Greatest	A is Greatest
HOM	a>b && a>c	A is Greatest	Wrong Result

Table 2

Test Data a,b,c	Original_Program Result	FOM1 Result	FOM2 Result	HOM Result
15,10,5 a>b && a>c	A is Greatest	Wrong Result	Wrong Result	Wrong Result
25,20,10 a>b && a>c	A is Greatest	Wrong Result	Wrong Result	Wrong Result
20,25,10 a<b && a>c	B is Greatest	A is Greatest	B is Greatest	B is Greatest
25,20,50 a>b && a<c	C is Greatest	C is Greatest	A is Greatest	C is Greatest

Table 2 From the Table-1 we find that there are 2 test cases which kill FOM1 and also 2 test cases which kill FOM2. There is one test case which kills HOM and is found in the intersection of FOM1 and FOM2. This test case kills both FOM1 and FOM2. The converse is not true. The test case ((a<b) && (a>c)) which kills FOM1 does not kill FOM2 and HOM. Similarly the test case ((a>b) && (a<c)) which kills FOM2 does not kill FOM1 and HOM. This is shown diagrammatically above in Figure 2.

From the Table-2 its clear that the test case a<b && a>c which kills FOM1 and the Original_program does not kill FOM2 and HOM, similarly the test case a>b && a<c which kills FOM2 and the Original_program does not kill FOM1 and HOM but the test case a>b && a>c found in the intersection of FOM1 and FOM2 kills our HOM and also FOM1 and FOM2. So if use this test case automatically both FOM1 and FOM2 will get killed thereby reducing the number of test cases without leading to loss of effectiveness.

CONCLUSION

In this paper, we examine the utilities of Higher Order Mutation Testing by creating mutants both First and Higher Order. From the above work we conclude that though HOM's are harder to kill but if we are able to find a subsuming HOM than the number of test cases reduces as these test cases will automatically kill all the FOM's from which it is constructed thereby leading to reduction in test efforts without loss of effectiveness.

REFERENCES

- [1] A. T. Acree. On Mutation. Phd thesis, Georgia Institute of Technology, Atlanta, Georgia, 1980.
- [2] T. A. Budd. Mutation Analysis of Program Test Data. Phd thesis, Yale University, New Haven, Connecticut, 1980.
- [3] W. E. Wong. On Mutation and Data Flow. Phd thesis, Purdue University, West Lafayette, Indiana, 1993.
- [4] A. P. Mathur and W. E. Wong. An Empirical Comparison of Mutation and Data Flow Based Test Adequacy Criteria. Technique report, Purdue University, West Lafayette, Indiana, 1993.
- [5] A. S. Namin and J. H. Andrews. On Sufficiency of Mutants. In Proceedings of the 29th International Conference on Software Engineering (ICSE COMPANION'07), pages 73–74, Minneapolis, Minnesota, 20–26 May 2007.
- [6] A. P. Mathur. Performance, Effectiveness, and Reliability Issues in Software Testing. In Proceedings of the 5th International Computer Software and Applications Conference (COMPSAC'79), pages 604–605, Tokyo, Japan, 11–13 September 1991.
- [7] M. Sahinoglu and E. H. Spafford. A Bayes Sequential Statistical Procedure for Approving Software Products. In Proceedings of the IFIP Conference on Approving Software Products (ASP'90), pages 43–56 Garmis Partenkirchen, Germany, September 1990. Elsevier Science.
- [8] R. A. DeMillo, D. S. Guindi, K. N. King, W. M. McCracken, and A. J. Offutt. An Extended Overview of the Mothra Software Testing Environment. In Proceedings of the 2nd Workshop on Software Testing, Verification, and Analysis (TVA'88), pages 142–151, Banff Alberta, Canada, July 1988. IEEE Computer society.
- [9] A. J. Offutt, G. Rothermel, and C. Zapf. An Experimental Evaluation of Selective Mutation. In Proceedings of the 15th International Conference on Software Engineering (ICSE'93), pages 100–107, Baltimore, Maryland, May 1993. IEEE Computer Society Press.
- [10] W. E. Wong and A. P. Mathur. Reducing the Cost of Mutation Testing: An Empirical Study. *Journal of Systems and Software*, 31(3):185–196, December 1995.
- [11] K. N. King and A. J. Offutt. A Fortran Language System for Mutation- Based Software Testing Software: Practice and Experience, 21(7):685–718, October 1991.
- [12] E. S. Mresa and L. Bottaci. Efficiency of Mutation Operators and Selective Mutation Strategies: An Empirical Study. *Software Testing, Verification and Reliability*, 9(4):205–232, December 1999.
- [13] A. S. Namin and J. H. Andrews. Finding Sufficient Mutation Operators via Variable Reduction. In Proceedings of the 2nd Workshop on Mutation Analysis (MUTATION'06), page 5, Raleigh, North Carolina, November 2006. IEEE Computer Society.
- [14] A. S. Namin and J. H. Andrews. On Sufficiency of Mutants. In Proceedings of the 29th International Conference on Software Engineering (ICSE COMPANION'07), pages 73–74, Minneapolis, Minnesota, 20–26 May 2007.
- [15] A. J. Offutt, A. Lee, G. Rothermel, R. H. Urtich, and C. Zapf. An Experimental Determination of Sufficient Mutant Operators. *ACM Transactions on Software Engineering and Methodology*, 5(2):99–118, April 1996.

ANALYSIS OF EXPERIMENT

The results of four face recognition systems based on four individual techniques namely PCA, DCT, Template matching using Correlation and PIFS is discussed.

The experimental results are obtained on ORL face image database.

- A reference face database of 250 images is created. There are 25 persons, 10 poses corresponding to each person.
- Recognition rate results are obtained at two levels: At top 5-IDs and 10-IDs.
- Each image in the reference face image database is made as query. The top 5-IDs and 10-IDs are retrieved corresponding to each query image based on minimum matching distance.
- Rate of recognition for each image at top 5-IDs and 10-IDs is determined as the number of relevant images retrieved out of five and ten respectively.
- Then the average rate of recognition for system is determined at top 5-IDs and 10-IDs.

Analysis of recognition rate at the 1st level (at top 5 IDs)

Effect of varying number of eigenvectors at top 5 IDs for PCA and DCT coefficient

Here we present the recognition accuracy of system based on PCA/DCT at top 5-IDs as the function of number of eigenvectors. The recognition rate increases as the number of eigenvectors increases. It becomes maximum at 24 eigenvectors.

Table 5.1: Effect of Varying Number of Eigenvectors on Recognition Rate at Top 5-IDs

No. of Eigenvectors	3	6	9	12	15	18	21	24	27	30
Recognition rate (%)	0.7632	0.8496	0.8928	0.9008	0.9056	0.9056	0.9080	0.9088	0.9080	0.9080

We observe that there is slight bit of decrease in recognition accuracy as we go to higher number of eigenvectors.

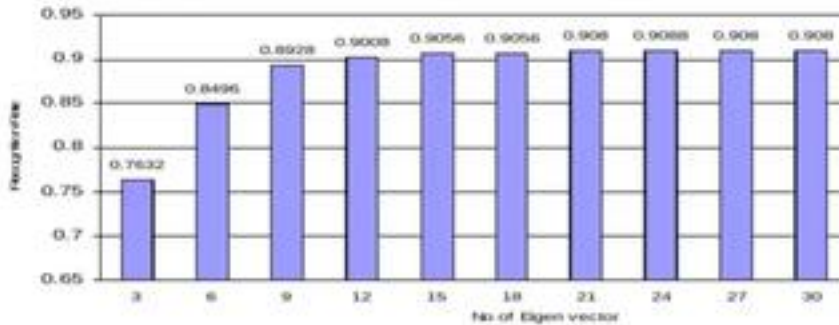


Fig. 5.1: Effect of Varying Number of Eigenvectors at Top 5-IDs

The recognition rate of Discrete Cosine Transform depends on the number DCT coefficients used. The recognition rate of the system based on DCT increase with the increase in number of DCT coefficients. It becomes maximum at 12x12 DCT coefficients.

Table 5.2: Effect of DCT Coefficients on Recognition Rate at Top 5-IDs

No. of DCT Coeff	2x2	4x4	6x6	8x8	10x10	12x12	14x14	16x16	18x18	20x20
Recognition Rate (%)	0.3348	0.7588	0.8722	0.9234	0.9276	0.9324	0.9324	0.9324	0.9324	0.9322

The figure below shows the recognition rate at top 5-IDs. We observe that as we go for higher number of DCT coefficients, there is a slight bit of decrease in the recognition rate.

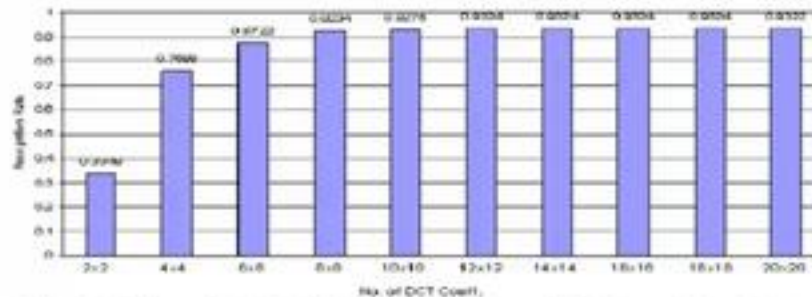
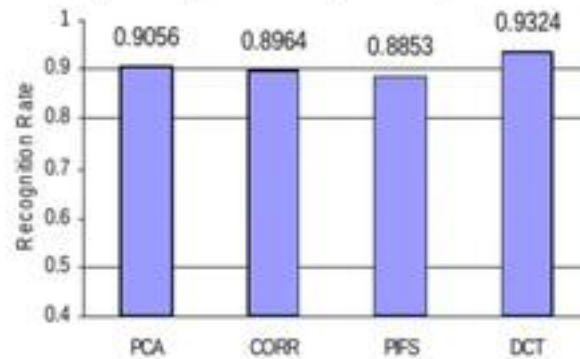


Fig. 5.2: Effect of DCT Coefficient on the Recognition Rate at Top 5-IDs

Table 5.3: Average Recognition Rate of Face Recognition Rate by Individual four Techniques at Top 5 IDS

S. No.	Face Recognition Methods	Recognition Rate (%)
1	PCA	0.9056
2	Coer	0.8964
3	PIFS	0.8853
4	DCT	0.9324

We find that the DCT based face recognition systems has higher recognition rate as compared to other three systems.

**Fig. 6.3: Recognition Rate at Top 5-IDs of the four Individual Techniques**

Analysis of recognition rate at 2nd level (at top 10 IDS)

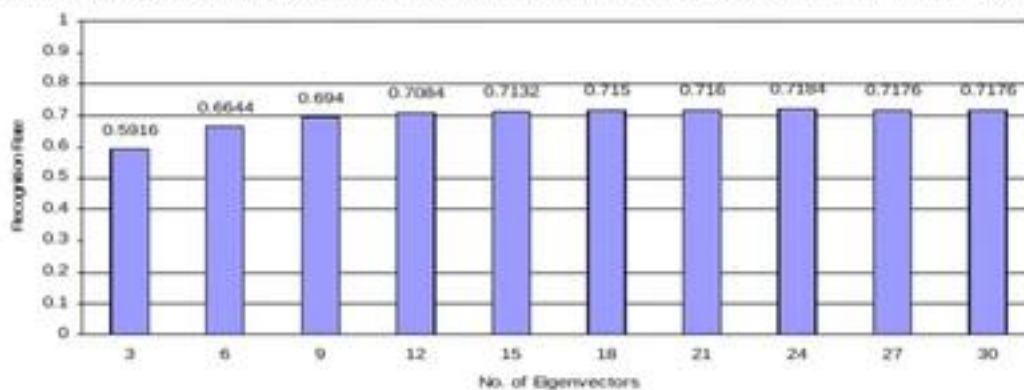
Effect of varying number of eigenvectors at top 10 IDs for PCA and DCT coefficient

The number of Eigenvectors affects the recognition rate of the system based on PCA. The table below shows that rate increase as the number of Eigenvectors increase, for top 10- IDs, it becomes, maximum at 24 Eigenvectors.

Table 5.4: Effect of Varying Number of Eigenvectors on Recognition Rate at Top 10-IDs

No. of Eigenvectors	3	6	9	12	15	18	21	24	27	30
Recognition rate (%)	0.5916	0.6644	0.6940	0.7084	0.7132	0.7150	0.7160	0.7184	0.7176	0.7176

We observe that with the more increase in the number of Eigenvectors there is a slight bit of decrease in the recognition rate. Following fig. shows graphical representation of number of Eigenvectors verses the recognition rate.

**Fig. 5.4: Effect of Varying Number of Eigenvectors on Recognition Rate at Top 10-IDs**

The rate of recognition of the system based on DCT varies as the number of DCT coefficients is varied. The table below shows that the rate increases as the number of DCT coefficients increase. It becomes maximum at 12x12 DCT coefficients.

Table 5.5: Effect of DCT Coefficients on Recognition Rate at top 10-IDs

No. of DCT Coff	2	4	6	8	10	12	14	16	18	20
Recognition Rate (%)	0.3335	0.6214	0.6923	0.7321	0.7402	0.7420	0.7420	0.7420	0.7420	0.7402

In the figure below, we observe that as we go for higher number of DCT there is a slight bit of decrease in the recognition rate.

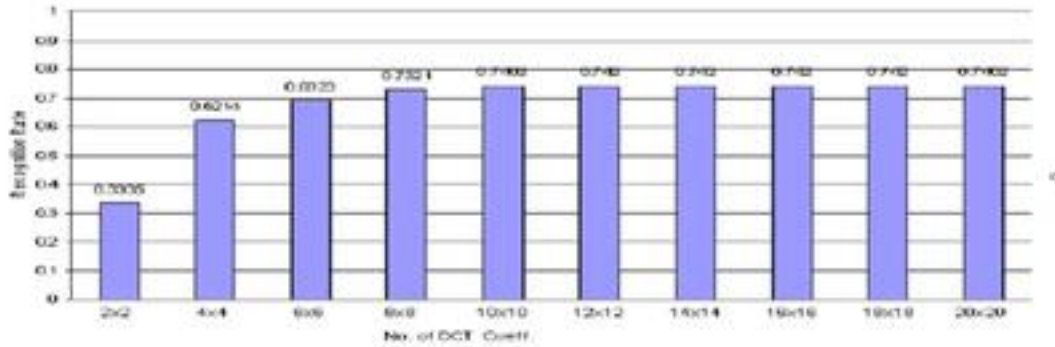


Fig. 5.5: Effect of Varying DCT Coefficient on the Recognition Rate at Top 10-IDs.

The experimental results of face recognition systems based on the individual techniques at top 10-IDs are shown in the figure below.

Table 5.6: Recognition Rate at Top 10-IDs of the four Recognition Systems

S. No.	Face recognition Methods	Recognition Rate (%)
1	PCA	0.7184
2	Corr	0.7084
3	PIFS	0.6808
4	DCT	0.7420

The table shows the recognition rates of the four recognition systems based on four individual techniques namely PCA, DCT, Template Matching using Correlation and PIFS. We find that the DCT based face recognition systems has higher recognition rate as compared to other three systems.

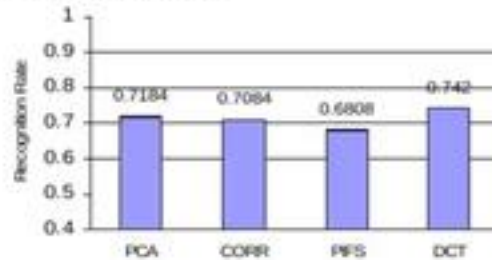


Fig. 5.6: Recognition Rate at top 10-IDs of the four Recognition Systems

CONCLUSION

In this work, we have developed multi algorithmic approaches for the purpose of face recognition based on four individual techniques namely PCA, DCT, Correlation and PIFS with the combination of two individual algorithms. we find that the DCT based face recognition systems outperforms the other three face recognition systems as it has higher recognition rates in both cases.

REFERENCES

- [1] R. Gross, J. Shi and J. Cohn., "Quo vadis Face Recognition: Third Workshop on Empirical Evaluation Methods in Computer Vision", Carnegie Mellon University, Pittsburgh, USA, December, 2001.
- [2] D. Blackburn, M. Bone, and P. Phillips, (2000), "Facial Recognition Vendor Test 2000: Evaluation Report", publish in National Institute of Science and Technology, Gaithersburg, USA.
- [3] P. J. Phillips, H. Moon, S.Rizvi and P. Rauss, (2000), "FERET Evaluation Methodology for Face Recognition Algorithms", IEEE transaction on pattern analysis and machine intelligence (PAMI 2000), Los Alamitos, USA, pp.1090-1103.
- [4] Z. M. Hafeed and M. D. Levine, (2001), "Face Recognition Using the Discrete Cosine Transform", International Journal of Computer Vision, vol.(43), no.3, pp.167-188.
- [5] Turk, M. and A. Pentland, (1991), "Eigenfaces for Recognition", Journal of Cognitive Neuroscience, pp. 71-86.
- [6] S. Chandran and S. Kar, (2002), "Retrieving Faces by the PIFS Fractal Code", Proceedings of the Sixth IEEE Workshop on Applications of Computer Vision (WACV 2002), Orlando, Florida, pp. 8-12, Dec.
- [7] Ming-Hsuan Yang, D.J. Kriegman and N. Ahuja, (2002), "Detecting Faces in Images: A Survey", IEEE Transactions on Pattern Analysis and Machine Intelligence, vol.(24), no.1, pp. 34-58, Jan.
- [8] Tat-Jun Chin and David Suter, (2004), "A Study of the Eigenface Approach for Face Recognition", Technical Report of Monash University, Dept. Elect & Comp.Sys Eng (MECSE 2004) Australia, pp.1-18.
- [9] The Database of Faces, <<http://www.cl.cam.ac.uk/research/dtg/attarchive/Facedatabase.html>>.
- [10] M. Bicego, U. Castellani & V. Murino; "Using Hidden Markov Models and Wavelet for face recognition" <<http://profs.sei.univr.it/~bicego/iciap2003.pdf>>.
- [11] Wei Chen, Tongfeng Sun, Xiaodong Yang, and Li Wang, (2009), "Face detection based on half face-template", Proc. of the IEEE Conference on Electronic Measurement and Instrumentation, pp. 54-58.

A Architecture of Congestion Control at Application Layer using Vehicular Ad-hoc Network

Anand Sharma, Malikhhan Singh, Nidhish Singh and Pradeep Kumar Sharma

Dept. of Computer Science, ACET, Aligarh (U.P.)

Abstract—The basic objective of congestion control is to best exploit the available network resources while preventing sustained overloads of network nodes and links. Vehicular ad-hoc networks (VANET) are a form of MANETs used for communication among between vehicles and roadside equipment. The basic idea of our application layer congestion control approach is to define policies, based on dynamically scheduling messages transmission in the network. Our approach is divided into three steps that we present hereafter: dynamic priority assignment, message scheduling and message transmission.

Keywords: VANET, congestion detection and control, application layer

INTRODUCTION

VANET is the technology of building a robust Ad-hoc network between mobile vehicle and each other, besides, roadside units.

Figure:1 is illustrating there are two types of nodes in VANETs; mobile nodes as On Board Units (OBUs) and static nodes as Road Side Units (RSUs). An OBU resembles the mobile network module and a central processing unit for on-board sensors and warning devices. The RSUs can be mounted in centralized locations such as intersections, parking lots or gas stations. They can play a significant role in many applications such as a gate to the Internet. VANET presents a new and promising field of research, development and standardization. The 'Dedicated Short Range Communications (DSRC)' [3] is a pioneer ITS (Intelligent Transportation Systems which is a branch of the U.S. Department of Transportation [12]) project dedicated to VANET standardization.

VANET applications: These new scenarios generally fall into safety or non-safety (comfort) categories. Safety applications include imminent collision warning, forward obstacle detection and avoidance, highway/rail collision avoidance, emergency message dissemination, intersection decision support, cooperative driving (e.g. lane merging, cooperative collision warning, etc. [9, 11]). Non-safety applications include traffic congestion advisories, route updates, traveler and tourist information, automated toll and parking services, etc. Safety application communications are usually of broadcast type, whereas non-safety applications are typically based on request-response communication schemes [10, 11]. Safety applications related to accident reconstruction in VANETs have not been a focus of research, or at least we were not able to find sources discussing this particular topic. We believe possibilities of leveraging inter-vehicle communications within the VANET framework for the purpose of analyzing crash data for accurate accident reconstruction are quite promising.

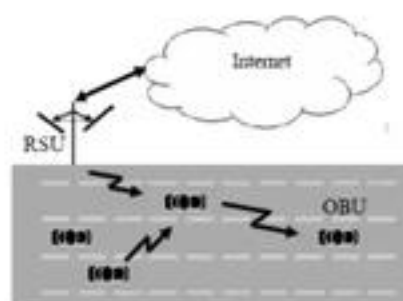


Fig. 1: Node types in VANETs, from [2]

Due to the high mobility of vehicles, that can be up to one hundred fifty kilometers per hour, the topology of any VANET changes frequently and unexpectedly. Hence, the time that a communication link exists between two vehicles is very short especially when the vehicles are traveling in opposite directions. The congestion and related vehicle accommodation problem is accompanied by a constant threat of accidents as well. Absence of road traffic safety takes a toll of precious human lives and poses a dire threat to our environment as well. Other negative consequences are related to energy waste and environmental pollution. Due to congestion we find three major issues about message priority, message scheduling, and message transmission between vehicles to vehicle.

- Congestion Detection and Congestion Control
- Priority Assignment
- Messages Scheduling

RELATED WORK

In VANETs, the main challenge of the communication which will lead to the frequent end-to-end transmission delay and reliability issue of safety messages [6]. One of the important aspects with future of VANETs is to maintain the efficiency network operation while preventing degradation of wireless channels communication because of expected amount of data generated by vehicles in dense network. Some of researchers challenges on develop congestion control approaches in VANETs are introduced in [1, 4, 5, 6, 7]. By controlling the load a saturated channel conditions and their negative impact on performance of wireless channels communication will be avoided.

Mostly research in congestion control [1, 4, 6] focused on comfort applications such as browsing Internet, multimedia etc. However research from [5] concentrated on safety messages. The safety application is important to improve the safety level of passengers by exchanging safety relevant information between vehicles.

Research from [6] explored concepts and proposed a good framework for congestion control for safety messages in VANETs. To deal with congestion in data networks, they proposed three steps are taken in sequence:

- Monitor networks and detect congestion
- Pass congestion information to protocol instances
- Adjust system operation to cope with congestion.

They also believe it is necessary that each node takes both the following two approaches in a distributed way:

- Reactive approach: reduce network load in response to locally obtained feedback from the network.
- Proactive approach: reduce network load irrespective of the network load in order to prevent congestion from happening in the first place

They proposed congestion control architecture illustrated in Figure 2.

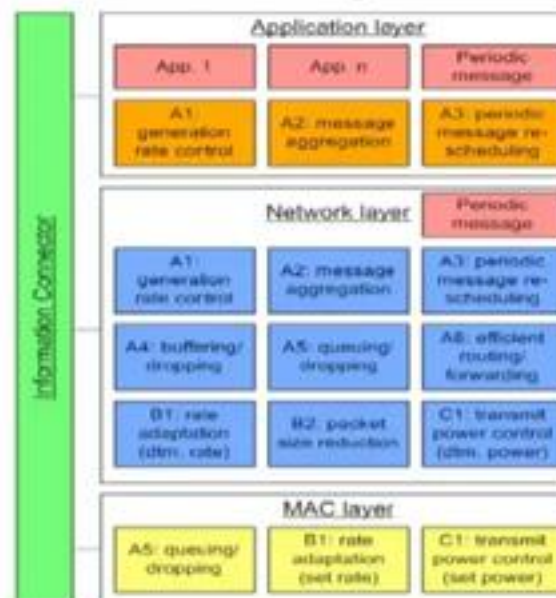


Fig. 2: Congestion Control Architecture

Some of researcher considers the utility of packets an important part in congestion control [1, 4]. In research [4], they proposed a novel concept for utility-based congestion control and packet forwarding in VANETs. This protocol called as decentralized Utility-Based Packet Forwarding and Congestion Control (UBPFCC) is implemented on top of the IEEE 802.11 MAC protocol. The control algorithm uses an application-specific utility function and encodes the quantitative utility information in each transmitted data packet in a transparent way for all users within a local environment. A decentralized algorithm then calculates the "average utility value" of each individual node based on the utility of its data packets and assigns a share of the available data rate proportional to the relative priority. While research in [1] applied message utility one of dynamic factor, according to the number of its retransmissions by the neighbourhood.

Most of studies in congestion control set a threshold to detect congestion in communication channels [1, 5, 7]. For example [5] applied channel usage level as threshold. Each device periodically senses the channel usage level, and detects the congestion whenever the measured channel usage level exceeds the predefined threshold. Research from [1] set a queue length as threshold. If the queue length exceeds a threshold, congestion is indicated and the preceding node is notified in order to decrease its transmission rate. However [7] set channel occupancy time as threshold. If channel occupancy time measured at a node in CCH is longer than a given threshold, all beacon messages will be blocked immediately.

Some of researchers was developed a congestion control approach based on the concept of dynamic priorities-based scheduling [1]. The purpose of dynamic priorities-based scheduling is to ensure a reliable and safe communications architecture within VANET. In this research, they evaluated dynamic priority based on three factors:

- Node Speed Consideration
- Message Utility Consideration
- Message Validity Consideration

The dynamic scheduling periodically each node triggers a rescheduling process, consisting of scanning the messages queues, and computing the overall priority indicator for each message (taking into account the dynamic factor of each priority). The rescheduling process then reorders the messages according to their new computed priorities.

ARCHITECTURE OF CONGESTION CONTROL

The basic idea of our applicative-layer congestion control approach is to define policies, in order to dynamically and cooperatively schedule messages transmission in the network. Messages scheduling is carried out according to priorities, evaluated as a function of the utility of the concerned messages, the sender application and the neighborhood context. The messages transmission in the vehicular network is carried out in an efficient and cooperative manner, by favoring vehicles holding the highest-priority messages to send. Therefore, our approach is divided into three steps that we present hereafter: dynamic priority assignment, message scheduling and cooperative message transmission.

We will design new scalable congestion control architecture to drawback delay, reliability and broadcast storm problem in disseminating event-driven safety messages. This congestion control architecture can be divided into three main parts:

Congestion Detection and Congestion Control

The purpose of the congestion detection is to monitor network communication channels and detect congestions. Two kinds of congestion detection methods in our congestion control approach are event driven detection and measurement-based detection. The event-driven detection method monitors the safety messages and decides to start the congestion control whenever a high priority safety message is detected.

Priority Assignment

Messages will be assigned a priority by application initiating. The relative time of transmission of each priority level will however vary as network density increases: medium and low priority packets being delayed to allow high priority packets to be sent without delays. The priority of a packet is composed of 2 fields: the first is static, deduced from the application type and the second is dynamic, obtained from the specific context of the VANET (neighborhood density) and determined by the congestion control module. The sizes of the message, the dynamic and static fields are combined to obtain the overall priority indicator ($Pri_{message} = \text{Dynamic_factor} \times \text{Static_Message_Priority} / \text{Message_size}$).

Messages Scheduling

Each node schedules its messages according to their priorities, in the appropriate channel. The Car to car Communication Consortium (C2C CC) considers two VANET wireless channels (control and service), each used for different traffic [8].

Control Channel (CCH)

The CCH is primarily used to transmit beacons and high/first hop priority traffic. All messages that are necessary to maintain the VANET are transmitted on this channel, especially the network layer beacons. Furthermore, high priority messages (emergency notifications) are sent on this channel. Normally, such messages occur on an event basis. With multihop communications, only the first hop will require high priority.

Service Channel (SCH1)

This channel is available for safety applications with lower priority. Here periodic messages could be sent. This channel should also be used by forwarders of multihop and geocast messages. A second SCH is intended to short distance peer to peer VANET communications, with reduced power level. However, this service channel is currently unused.

Hence, we split the scheduling process into two phases: static and dynamic, presented hereafter:

Static Scheduling

The static scheduling process consists of dispatching messages according to their priorities, into the suitable communication channel queues. Thus, $PRI_{EMERGENCY}$, PRI_{VANET} and PRI_{HIGH} priority messages are affected to the control communication channel queue, whereas PRI_{MID} and PRI_{LOW} priority messages are affected to the service queue.

Dynamic Scheduling

Periodically, each node triggers a rescheduling process, which scans the messages queues, and computes the overall priority.

Research Objective

Applicative layer congestion control approach, in order to define packets priorities according to their application, their utilities and validities in the network and the neighbourhood context.

Methodology

Messages transmission process sends the highest priority message within the corresponding channel, whenever it is free. However, sending high priority packets via the control channel is preemptive, compared to packets sent via service channel. Indeed, in order to send high priority packets with the minimum delay, lower priority packets emission is frozen, even if their corresponding channel is free. We divide our cooperative transmission technique into two main mechanisms that we present hereafter: the available bandwidth sharing and the next forwarder selection for the multihop communication case. These procedures require the modification of the periodic beacon structure, that we present later.

Concerning the dynamic use of the bandwidth within VANET, the IEEE 802.11p underway standard supports three mandatory user data rates 3 Mbit/s, 6 Mbit/s and 12 Mbit/s within a 10 Mhz channel, and some optional data rates up to 27 Mbit/s. The most robust data rate is the 3 Mbit/s one. This rate must be shared among all applications and vehicles inside the interference range. In order not to saturate the provided bandwidth and to allow a reliable transmission of the emergency messages, the bandwidth offered to VANET application per 10 Mhz is equal to the half of the total bandwidth.

The simplest way to share the available bandwidth to the neighbors is to divide it equitably between them, as follows. Let n denotes the number of neighbors of a node. The effective bandwidth that a vehicle can use within the vehicular network is thus computed as

$$\text{Effective_Bandwidth} = \text{Selected_Bandwidth} / (2(n+1))$$

However, such a solution treating all the neighbours equitably does not favour higher-priority messages holders to use the available bandwidth, nor avoids eventual collisions and interferences. The suitable solution to eliminate these drawbacks is to offer the available bandwidth to the transmitter node whose message holds the highest priority compared to the messages of its neighbours.

In order to notify its neighbours about the priority of the first message it has to send, each vehicle includes this information in its beacon structure, as presented in Section 3.4.3. Therefore, as for the token ring communication protocol, a node can use the available bandwidth only if it holds the highest-priority message (it does not receive any beacon notifying the occurrence of a higher-priority message holder within its neighbourhood). In the same way, when a node receives beacons notifying the presence of higher-priority messages than messages that it will send (the first messages in its queues), it freezes its transmission.

When two vehicles have to send two messages with the same priority, as for the FIFO scheduling model, the available bandwidth will be devoted to the first vehicle who notifies the priority of its message. The time of a first notification corresponding to a message priority should thus be included in the beacon structure. Note that generally, messages corresponding to a vehicular application have the same priority; consequently, the priority notification sent within beacons is not frequently modified.

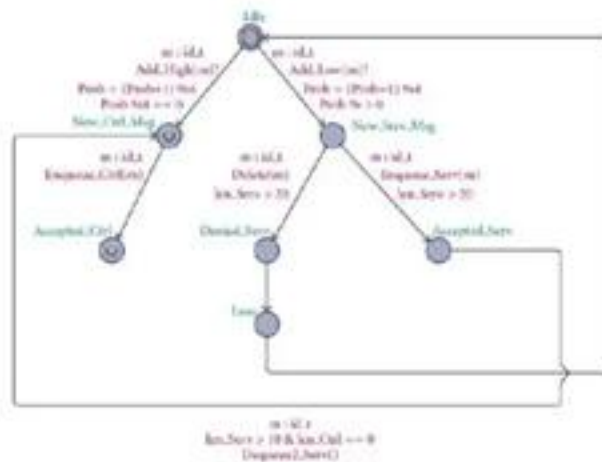


Fig. 3: Congestion Control Message Enqueueing

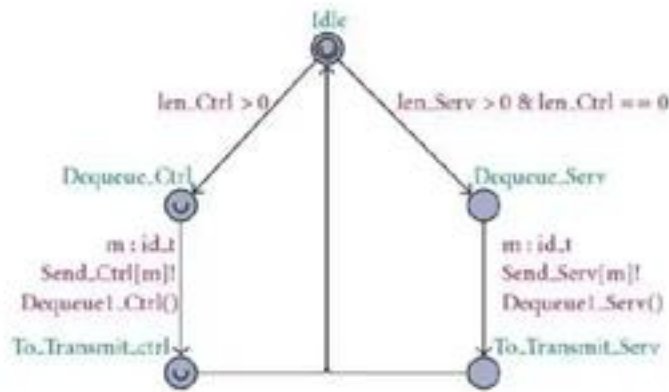


Fig. 4: Congestion Control Message Dequeuing

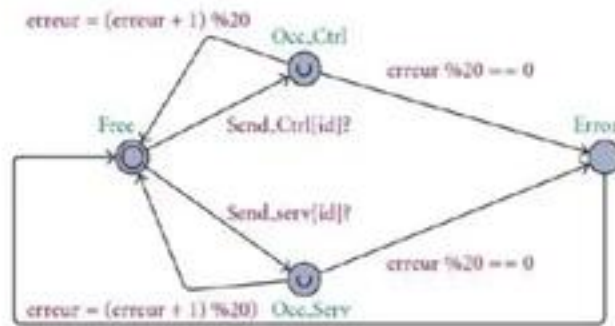


Fig. 3: Transmission Engine

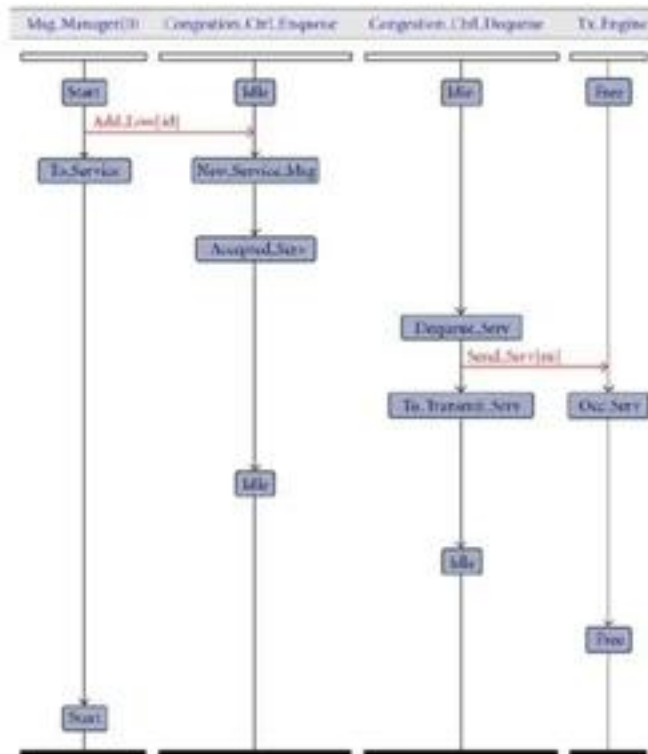


Fig. 5

The Verification step Validates the Following Results:

1. No deadlock in the operation of our messages priorities-based scheduling approach. All states of the modeled automata have successors.
2. All states of the modeled automata are eventually reachable.
3. All the high priority messages are effectively sent on the control channel. However, some low priority packets can be deleted, due to service channel congestion
4. The transmission of high priority messages is preemptive comparing to the emission of low priority messages.
5. In addition, the emission of a high priority message is carried out without delay.

CONCLUSION

We presented our cooperative congestion control approach, based on dynamic messages scheduling and transmission, considering the network load and the neighbourhood context. Then, we validate the efficiency and the real operability of our congestion control technique through two principal steps: formal verification and validation, and performance evaluation and analysis. The formal verification step, carried out via the UPPAAL tool, proved the reliability of our congestion control technique in terms of reachability, safety, liveness, and no-deadlock properties, whereas the performance evaluation step considers the delays of messages before their effective sending in the appropriate queue, and the service packets-loss rate.

REFERENCES

- [1] Y. Zang, L. Stibor, and H. J. Reuserman, (2007), "Neighborhood evaluation of vehicular ad-hoc network using IEEE 802.11p," in Proceedings of the 8th European Wireless Conference, p. 5, Paris, France.
- [2] H. K. Rath, A. Sahoo, and A. Karandikar, (2006), "Cross layer based congestion control in wireless networks for TCP Reno-2," in Proceedings of the 12th National Conference on Communications (NCC '06), Delhi, India, April.
- [3] V. Raghunathan and P. R. Kumar, (2005), "A counterexample in congestion control of wireless networks," in Proceedings of the 8th ACM Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM '05), pp. 290-297, Montreal, Canada, October.
- [4] Y. Yi and S. Shakkottai, (2007), "Hop-by-hop congestion control over a wireless multi-hop network," IEEE/ACM Transactions on Networking, vol. 15, no. 1, pp. 133-144.
- [5] D. Klizovich and F. Granelli, (2006), "Cross-layer congestion control in ad hoc wireless networks," Ad Hoc Networks, vol. 4, no. 6, pp. 687-708.
- [6] S. Rangwala, A. Jindal, K.-Y. Jang, K. Psounis, and R. Govindan, (2008), "Understanding congestion control in multi-hop wireless mesh networks," in Proceedings of the 14th Annual International Conference on Mobile Computing and Networking (MOBICOM '08), pp. 291-302, San Francisco, Calif, USA, September.
- [7] Y. Zang, L. Stibor, X. Cheng, H.-J. Reuserman, A. Paruzel, and A. Barroso, (2007), "Congestion control in wireless networks for vehicular safety applications," in Proceedings of the 8th European Wireless Conference, p. 7, Paris, France.
- [8] IEEE P1609.4, (2005), "Wireless access in vehicular environments (wave) multichannel operation," in Draft Standard, November.
- [9] A. David, (2002), "Uppaal2k: small tutorial," Report Version 3.2.11, October.
- [10] S. Olariu and M.C. Weigle, (2009), Vehicular Networks from Theory to Practice, CRC Press, Boca Raton, FL.
- [11] L.A. Klein, M. Mills, and D. Gibson, (2006), Traffic Detector Handbook, 3rd Ed., Vol. 1, Federal Highway Administration, Washington, D.C.
- [12] D. Jiang and L. Delgrossi, (2008), "IEEE 802.11p: Toward an International Standard in Wireless Access in Vehicular Environments," 68th IEEE Vehicular Technology Conference (VTC), Calgary, Alberta.

Cryptovirology: Extortion based Security Threats and Countermeasures

Nidhi Mishra¹ and Sakshi Pandey²

¹Dept. of IT, SRMSCET, Bareilly

²Dept. of CS, SRMSCET, Bareilly

Abstract—Cryptography is derived from Greek language where *kryptó* stands for "hidden" and *gráfo* stands for "to write". Traditionally cryptography is benediction to information processing & communications. It is used to provide confidentiality, integrity, authentication and security to data. It tells how modern cryptographic paradigms and tools can be used to strengthen, improve, and develop new malicious software attacks. Also analyse threats and attacks that misuse of cryptography can cause when combined with fraudulent software (viruses, Trojans). It describes a less prominent attack on standalone and networked computer systems known as Crypto Viral attacks. These are very powerful attacks, where the attacker can hold the victim's data for ransom. It attempts to make malicious attacks as sophisticated as possible by using different cryptological paradigms and increasing the anonymity of the attacks. Public-key cryptography is very essential for the attacks that based on cryptovirology. This paper also suggests some of the countermeasures, mechanisms to cope with and prevent such attacks. The experimental virus would demonstrate how cryptographic packages can be packed into a small space, which may have independent existence. These are many powerful attacks, where the attacker can encrypt the victim's data for ransom and release it after hostage.

Keywords: cryptography, cryptovirology, virus, public key cryptography, kleptography, cryptanalysis

INTRODUCTION

The most distinctive and alarming trends in current computer attacks are high automation and speed, increasing sophistication of attack tools, vulnerability discovery rate that is hard to keep up with, increasing permeability of firewalls and highly asymmetric nature of threat.

Each coin has its two sides. Cryptography is just like a coin which also has a destructive side and this side is named as Cryptovirology. Basically, Cryptovirology was born in *academia*. However, practitioners have recently expanded the scope of this field to include the analysis of cryptographic algorithms used by malware writers, attacks on these algorithms using automated methods and analysis of viruses' encryptors. 'virology' is the study of creation, duplication and propagation of viruses. Thus Cryptovirology is a field that studies how to use cryptography to design powerful *malicious software*. . Cryptovirology began when virus writers tried to break the security of a system through the use of public-key cryptography. Public-key cryptography breaks the symmetry between what an antivirus analyst sees regarding a virus and what the virus writer sees. The antivirus analyst sees only a public key, while the virus writer sees both a public key and a private key.

Historians say that the first attack in the field of cryptovirology involved cryptoviral extortion. In here, hackers used a virus or worm or Trojan hybrid to encrypt files of a victim and literally extort money from the victim. After hacking, the victim has to pay the hackers to receive the needed session key just to be able to get the files back. These viruses also go by the name ransomware.

The field was born with the observation that *public-key cryptography* can be used to break the symmetry between what an antivirus analyst sees regarding a virus and what the virus writer sees. The first attack that was identified in the field is called "cryptoviral extortion". In this attack a virus, worm, or trojan hybrid encrypts the victim's files and the user must pay the malware author to receive the needed session key (which is encrypted under the author's public key that is contained in the malware) if the user does not have backups and needs the files back.

A "questionable encryption scheme", which was introduced by Young and Yung, is an attack tool in cryptovirology. Informally speaking; a questionable encryption scheme is a *public key cryptosystem* (3-tuple of algorithms) with two supplementary algorithms, forming a 5-tuple of algorithms. It includes a deliberately bogus yet carefully designed key pair generation algorithm that produces a "fake" public key. The corresponding private key (witness of non-encryption) cannot be used to decipher data "encrypted" using the fake public key. By supplying the key pair to an efficient verification predicate (the 5th algorithm in the 5-tuple) it is proven whether the public key is real or fake. When the public key is fake, it follows that no one can decipher data "enciphered" using the fake public key. A questionable encryption scheme has the property that real public keys are computationally indistinguishable from fake public keys when the private key is not available. The private key forms a poly-sized witness of decipherability or indecipherability, whichever may be the case.

An application of a questionable encryption scheme is a *trojan* that gathers plaintext from the host, "encrypts" it using the trojan's own public key (which may be real or fake), and then filtrates the resulting "ciphertext". In this attack it is thoroughly intractable to prove that data theft has occurred.

Image based Dual Level Authentication System

Vaibhav Sharma¹, Gulista Khan², Dhanshree Gupta³ and Hari Om Sharan⁴

^{1,2,3}COE, TMU

⁴HOD, CS Dept. COE, TMU, Moradabad

Abstract—Previous research recognized the weaknesses of knowledge-based authentication schemes (in particular password-based computer logins). So far, however, most of the proposed solutions have been based on technical fixes or on educating users. Neither of these addresses the fundamental problem of knowledge-based authentication systems, which is that the authentication task is based on precise recall of the secret knowledge. As since people are much better at recognizing previously seen images than at previously recalling pass phrases from memory, for that we employ a Dual Level Authentication. In this during sign in process after confirming password the server side will show an image and ask for predefined locations in the image. After confirming those location the person get sign in. For applying this type of authentication we use image Coordinates. For that initially for sign up server shows a picture and it asks person for clicking on some positions which saves in server memory. In sign in process it check password as well as predefined image coordinates. If person clicks on same coordinates then he get sign in. This Authentication system provides more security than previously defined techniques.

Keywords: Dual level Authentication, Image authentication, biometric.

INTRODUCTION

Authentication plays an imperative role in protecting resources against unauthorized use. Many authentication processes exist from simple password based authentication system to costly and computation intensive Biometric authentication systems. But still the most widely used authentication system is based on the use of text passwords [2] [4]. Text based passwords are not secure enough for many applications that enforce security by access control mechanisms. Authentication based on text based passwords has major drawbacks. More sophisticated authentication process is costly and may need additional equipment or hardware. To overcome such drawbacks we developed a system for verification of personal identity using Java. In this project we have investigated how the security of user authentication can be improved by using both text passwords and structured images. Our registration and authentication algorithm is called IBDLA.

The purpose of this paper is to present the dual level authentication process which is simple enough, cost effective and does not need any additional hardware. This IBDLA can be used in educational institutions as well as corporate world with ease. The paper is organized in to many sections. Firstly we present the authentication problem and different authentication processes. The next section explains the advantages and disadvantages of existing authentication systems. Then we present our solution authentication system.

AUTHENTICATION

Authentication is a function where a user presents some credentials to the system. If the system recognizes this set of credentials or the credentials match a given set on the system, then the user is said to be authorized otherwise the user is not authorized [7]. Authentication is needed to let the system perform some tasks for the user. The user needs to be authorized to request services from the system. Before a user can be authenticated to the system, he has to be registered with the system for the first time. This step is called registration. So, for a new user, he has to get registered with a system and then authenticated before he can request services.

In a basic authentication process, a user presents some credentials like user ID and some more information to prove that the user is the true owner of the user ID. This process is simple and easy to implement. An example of this type of authentication process is the use of user ID and password.

A complicated process involves a user ID, password and a key value generated with time and which changes constantly at fixed intervals. A user is authenticated only if all three values are right. This is better and more secure than the basic authentication process as the user has to be there physically to use the changing key. An example of this process is use of smart cards [6].

The third authentication process uses biometrics. Biometrics can measure finger prints, retinal scan, facial image scan and many more. In this case, a user always has these credentials on him. User has to present physically for authentication. The most widely used authentication process uses user ID and a password. Our authentication system can be classified under the simple authentication process which is more secure and powerful than the password based system.

COMPARISON OF PASSWORDS, BIOMETRICS AND IBDLA SYSTEMS

The pros and cons of existing and proposed system are discussed in the following sections.

Password Based Authentication System

This is a simple system where a user presents a user ID and a password to the system. If the user ID and password match with the one stored on the system, then the user is authenticated. A user may have many accounts on many computers. He has to remember many passwords. Research on human cognitive ability has generated a lot of knowledge on what an

The field also encompasses covert attacks in which the attacker secretly steals private information such as private keys. An example of the latter type of attack are asymmetric *backdoors*. An asymmetric backdoor is a backdoor (e.g., in a cryptosystem) that can be used only by the attacker, even after it is found. This contrasts with the traditional backdoor that is symmetric, i.e., anyone that finds it can use it. Kleptography, a subfield of cryptovirology, is concerned with the study of asymmetric back doors in key generation algorithms, digital signature algorithms, key exchanges, and so on.

BACKGROUND

Cryptography

Cryptography is the science of writing in secret code and is an ancient art; the first documented use of cryptography in writing dates back to circa 1900 B.C. when an Egyptian scribe used non-standard hieroglyphs in an inscription.

The important encryption techniques are symmetric, asymmetric and hash function algorithms.

Cryptovirology

Cryptovirology is the study of the applications of cryptography for implementation of malicious software.

GOAL: Attack systems + give new capabilities

Kleptography

The art and science of stealing information securely and subliminally. Kleptographic attacks are primarily geared towards designing black box ciphers to leak secret key information securely and subliminally to the designer." A secure kleptographic attack is truly undetectable as long as the cryptosystem is a black-box.

Virus

A **computer virus** is a program or piece of code written with malicious intent, so to alter the normal working of the computer and is done without the knowledge or permission of the legitimate user.

Trojan

A Trojan is a piece of code that claims to be something desirable but in practice is malicious. Once a user is tricked into running a trojan, it acts as a backdoor to the computer on which it is running. Trojans can be potentially malicious and may cause widespread damage such as erasing files, stealing of passwords and so on.

A computer virus is defined as a program that can infect other programs by modifying them to include a, possibly evolved, copy of itself [Coh89]. "VIRUS" stands for Vital Information Resource Under Siege.

The fields of virus and antivirus technology are broad in scope and are slowly changing over time.

Virus acts on the "Theory of self-reproducing automata". There are several rules that all viruses seem to obey.

1. After gaining access, the virus may attempt to execute certain tasks, called its payload. Though some viruses do little but replicate,

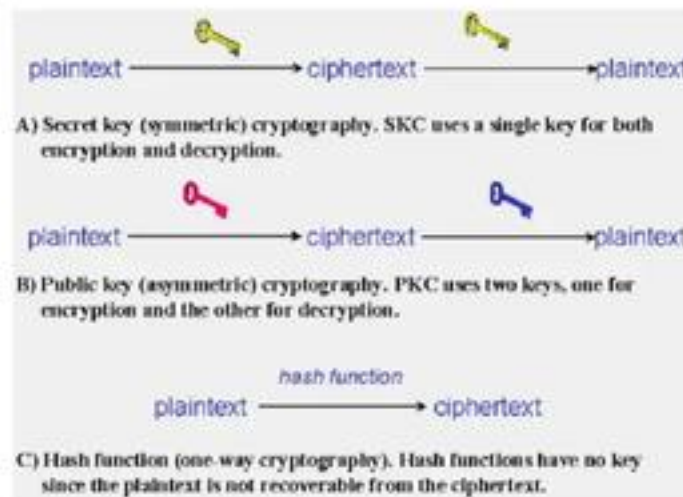


Fig. 1: Types of Cryptography

2. Others can cause serious damage or effect program and system performance.
3. A virus is capable of being a resident that is first loaded into memory and then infects the computer.
4. A virus can lead to another virus making it much more lethal and help each other to hide.
5. Since viruses need to gain control of the program counter in order to execute, they must (directly or indirectly) modify code in the host system in order to do so.

ATTACKING METHODOLOGY OF A CRYPTOVIROLOGICAL ATTACK

A cryptographic attack can be performed by a cryptovirus or a cryptotrojan, which are defined by the following.

Definition: A cryptovirus (cryptotrojan) is a computer virus (Trojan horse) that uses a public key generated by the author to encrypt data D that resides on the host system, in such a way that D can only be recovered by the author of the virus.

CRYPTOVIROLOGY EXTORTION

Young and Yung gave the following definition:

"Crypto-viral extortion, which uses public key cryptography, is a denial of resources attack. It is a three-round protocol that is carried out by an attacker against a victim. The attack is carried out via a crypto-virus that uses a hybrid cryptosystem to encrypt host data while deleting or overwriting the original data in the process."

The three-round protocol is interesting. It consists of the following:

Crypto-Virus is Installed

Using any number of techniques, usually *drive-by dropper* platforms; the crypto-virus gets installed on vulnerable computers. When the virus activates, it creates a symmetric key and initialization vector (IV). The crypto-virus proceeds to encrypt data files using the symmetric key and IV. After which, the crypto-virus concatenates the IV with the symmetric key. Finally, the concatenated string is encrypted using the malware author's public key. With everything now in place, the crypto-virus pops open a window explaining the ransom demands to the victim.

Victim's Response

If the victim decides to pay the ransom. There are several ways that can happen. We will look at those in a bit. The victim also has to send the encrypted concatenated string to the cybercriminal.

Attacker's Response

The extortionist then decrypts the string using the private key, which discloses the symmetric key and IV. Finally, sending both back to the victim. Who will use them to decrypt the data files?

To help understand the entire process, let's look at what many consider cutting-edge ransom ware. F-Secure have released information about Trojan: W32/DatCrypt. Here's how it works.

The Trojan makes its way onto the victim's computer. After which, it gives the illusion data files such as Office documents, music, audio, and video are corrupt. As shown in the following slide (courtesy of F-Secure):



Fig. 2: Indication of Corrupted Files

In reality, the files have been encrypted by the Trojan. The next message opened by DatCrypt informs the victim to download specified file repair software. Notice how the window created by the malware appears to be a message from the Security Centre (courtesy of F-Secure): advantage is that the virus writer no longer needs to handle the RSA private keys and the victim need not send anything other than the ransom to the virus writer.

The secret sharing scheme takes advantage of the fact that the RSA private key will be split across k or more hosts on the network making it hard for the system administrator find them and recover them.

DENIABLE PASSWORD SNATCHING



Fig. 3: Message from the Security Center

What is actually downloaded is *Rogue:W32/DatDoc*. Malware that gives the appearance of fixing the problem. But, only one file can be fixed with the free version (courtesy of F-Secure):

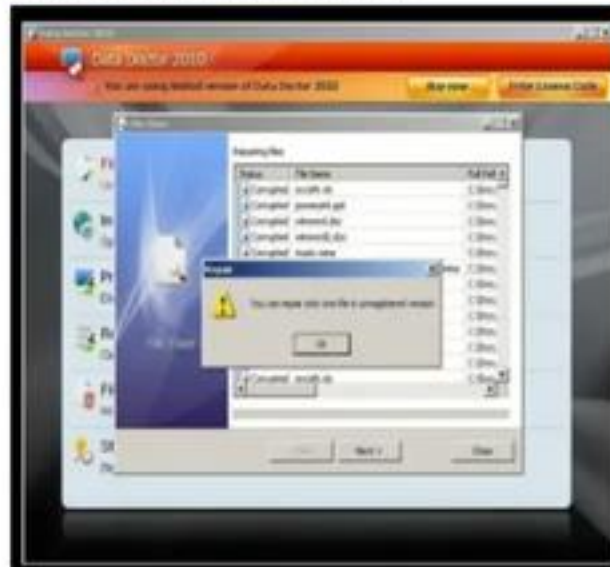


Fig. 4: Fixation of Files

2. The Secret Sharing Virus

Secret and confidential information theft is a major computer crime. ***“In 2002, more than \$70 million loss was reported due to information theft in US only”*** More than 80% of organizations reported virus’s attacks. Cryptovirus can be made into a secret sharing virus.

The idea works in the following setting:

We have a local network with n hosts. The mode of attack is similar to the previous scenarios except for that the RSA private key $RSAPri$ is now split among k or more nodes, $k < n$ and $RSAPri$ no longer resides with the virus author. The being blamed for installing it.

COUNTER MEASURES

There are several measures that can be taken to immensely reduce the risk of being get attacked or infected by a cryptovirus. Many of the attacks described in here can be avoided with existing antiviral mechanisms and tools, since cryptoviruses propagate in the similarly as traditional viruses does.

Currently password based authentication schemes are very common. Many organizations use this scheme for protection of crucial information. Users have to enter their password to access the information. These passwords are highly vulnerable to threats. The attack produces a threat with strong concealment properties. It involves the use of public key cryptosystem and *Las Vegas probabilistic algorithm* within a Trojan horse program. The probabilistic nature of Trojan horse implies better hiding of gathered information. The attacks have the effect that even if a system administrator discovers the Trojan horse program he will be unable to what have been stolen.

A typical use of Trojan horse program is to steal information that is entered through keyboard. When the key is pressed, the Trojan is activated via the patched interrupt and logs the key that was pressed in hidden files. Typically such programs are activated at certain well defined time.

In the DPS attack, the attacker first seeks to install a cryptotrojan into a target computer. Already it seems possible that the attacker is at the high risk of getting caught and most probably if he has installs the cryptotrojan manually. The attack is generally carried out by using a custom cryptovirus designed by the attacker. The attacker (virus author) distributes the virus preferably using the passive virus distribution channel. Once the virus gets installed a Trojan horse that it carries with it activated. The purpose of this whole is to allow the attacker to indirectly run code of his own Trojan without and watching out for zero day exploits.

CONCLUSION

In this paper it is clearly described that how Cryptography can be used to build the malicious software programs that can be used in extortion-based attacks on computer system. Cryptovirology turns cryptography into a powerful weapon. Public-key cryptography is necessary for the attacker to take advantage over the owner of infected system. Also presented a demonstrative cryptoviruses which could accomplish this very easily. And a set of measures that can be taken to minimize the risks of attack posed by the cryptovirology.

In short, the attack based on a cryptotrojan or cryptovirus, if made then it is not possible to linked it to its author. The cryptotrojan take the control over internal resources to steal passwords and login information, and make use of the strengths of probabilistic public key cryptography to maintain exclusivity of the stolen (or encrypted) data with respect to the virus author. The cryptotrojan is elusive in nature as it prevents the system administrator from being able to prove that anything has been stolen when the cryptotrojan is discovered due to its statelessness nature.

1. Permanent and direct memory monitoring is necessary to catch self-encrypting, polymorphic cryproviruses.
2. Only passwords are weak to authenticate a host. Two level authentications, first with the biometric entity such as the users fingerprint, iris scan and second using the password.
3. Use of up-to-date anti-virus machinery, since cryptoviruses spread the same way as normal viruses does.
4. Access control to cryptographic tools and API's. This will helps virus analyst or the system administrator to identify suspicious cryptographic usage of the system component.
5. We note that if strong cryptographic routines and good pseudo random number generators are available, it makes the virus smaller and simpler to code and faster to execute if the code is optimal. Incorporating strong cryptographic tools into the operating systems may increase system security but makes it vulnerable since viruses can make calls to these operation system routines. It is hence essential to monitor the processes invoking the cryptographic routines and try to prevent and log processes that do not have sufficient access privileges to call the crypto toolkit/library.
6. Use of *Firewall*.
7. Use of *Intrusion detection system*.
8. Applying patches as soon as it is made available

REFERENCES

- [1] Young, A. and Yung, M., Cryptovirology: Extortion-Based Security Threat and Countermeasures, Proceedings of the 1996 IEEE Symposium on Security and Privacy.
- [2] <<http://en.wikipedia.org/wiki/cryptovirology>>
- [3] <www.searchmidmarketsecurity.techtarget.com>

A Survey on Various Schemes for Address Assignment in MANETs

Shruti Saxena¹, Samir Srivastava², Monika Singh³ and Raksha Pandey⁴

^{1,4}Student, M-Tech 2nd Year, CSE Dept., KNIT, Sultanpur

²Assoc. Prof., Student, CSE Dept., KNIT, Sultanpur

³M-Tech 2nd Year, CSE Dept., KNIT, Sultanpur

Abstract—MANET is an infrastructure-less network which consists of mobile nodes which can communicate with each other. As the use and demand of mobile devices is increasing day by day, it is the emerging need to provide efficient service to the users. In MANETs, address auto-configuration is the most important and still unresolved issue. Many authors have classified address assignment protocols into stateful and stateless approaches. The classification of auto-configuration protocols is defined on the basis of the request for an IP address from a node. If the node is requesting an IP from a centralized authority then it is under centralized scheme, If the node is requesting an IP from its neighbor then it is under neighbor based scheme and if the node is configuring itself by its own then it is decentralized scheme. Various protocols under these schemes and the requirements while designing them are also discussed.

Keywords: Requirements, Centralized schemes, Neighbor-based schemes, Decentralized schemes.

INTRODUCTION

MANET is an infrastructure-less network which consists of mobile users that communicate over relatively bandwidth constrained wireless links. By infrastructure-less, we mean that an ad hoc network can be promptly deployed without relying on any existing infrastructure such as base stations for wireless cellular networks. As the nodes in mobile adhoc network are free to move therefore the topology may change rapidly over time. The main issues in MANETs are fading, multi-user interference, variable wireless link quality, propagation path loss, topological changes.

Address assignment is one of the major issue in mobile adhoc networks. When a new node wants to join a network, it has to be assigned an IP address as part of its initialization.

In stateless approach, each node configures its address by its own and then duplicate address detection is performed to check the uniqueness of the address. According to S. Cheshire et al., 2007, Zeroconf is based on stateless approach. It is also called Dynamic Configuration of Link Local Addresses. In this, when a node joins a network, it chooses an IP address and sends an ARP message to the node having a destination address as the chosen address. If it receives a reply, it means that address is already in use. Then it choose another address and repeat the process. Otherwise, it assumes that IP is free so it can use it.

According to Li Ru et al., 2009, when auto-configuration comes to reality, network partitioning and merging should be paid more attention. Mechanism for this should not consume more resources either in networks or in hosts.

Therefore, the protocol for address assignment must be designed such that it should be able to prevent these attacks.

The rest of the paper is organized as follows: Section 2 includes requirements for address assignment in MANETs, Section 3 classifies address assignment approaches on the basis of the request made, Section 4 focuses on centralized schemes, Section 5 discusses about neighbor based schemes, Section 5 discusses about decentralized schemes and Section 6 contains conclusion.

REQUIREMENTS

According to S Zahoor Ul Huq et al. ,2010, the various requirements which should be considered while designing any protocol for address assignment are as follows:

UNIQUENESS

Address assignment scheme must ensure the uniqueness of node address so that no ambiguity appears when communication occurs.

Topology Change

As MANET consists of mobile devices which are free to join or leave the network any time. Address assignment scheme should be able to manage this requirement.

Address Conflicts

The assignment scheme must be able to resolve address conflicts. Address should be configured in such a way that minimizes the probability that two or more nodes will have the same address.

Network Partitioning and Merging

During its lifetime, a network could be divided in two or more disconnected networks and then network merging can occur later. During the merge process, address configuration protocol must be able to avoid congestion caused by messages sent for the purpose of duplicate address detection. The address assignment scheme must be able to deal with these situations.

CLASSIFICATION OF ADDRESS ASSIGNMENT SCHEMES IN MANET

When a node enters into the network, an IP address is provided to it so that it can perform communication with other nodes in the network. There are three ways in which IP address can be configured. The classification is shown in the fig. 1.

Address Assignment Schemes

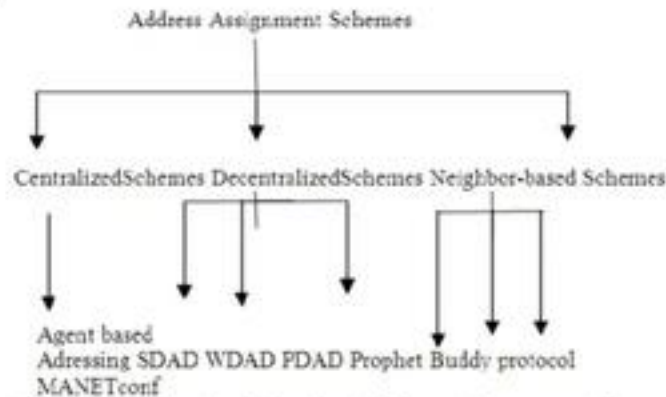


Fig. 1: Classification of Various Address Assignment Schemes

The main task of an address auto-configuration protocol is to manage the resource address space. It must be able to select, allocate, and assign a unique network address to an unconfigured node. When a node leaves the network, the corresponding address must eventually be de-allocated to prevent exhaustion of the address space.

In centralized scheme, a single node in the network is responsible for assigning IP addresses to new nodes joining the network. This node is called as leader. In this scheme, the address generated is unique but as the nodes are mobile; they are free to leave the network anytime. Therefore it is difficult to maintain a single leader in the network and increasing communication overhead in a single node. For example, agent based addressing which is designed for IPv6 MANETs in which a single node called address agent is responsible for assigning address to the requesting nodes.

CENTRALIZED SCHEMES

In this scheme there is a single node called leader which is responsible for the generation of IP address. There is only one allocation table which is maintained by the leader. But this approach does not provide efficient solution because of the dependence on a single node. As in MANETs, all the node have freedom to join or leave the network anytime including leader. Therefore, it causes an extra overhead when the leader changes frequently. Agent based addressing is an auto-configuration protocol which is based on this centralized scheme.

Agent Based Addressing

This protocol is used for auto-configuration in IPv6 MANETs. This is based on centralized allocation table and supposes the uniqueness of MAC addresses.

M. Gunes *et al.*, 2002 proposed this protocol in which only one node, which is called as Address Agent (AA) is responsible to provide addresses to the requesting nodes, thus it should be always reachable. The AA maintains the allocation table containing already assigned IP addresses with their corresponding MAC addresses and lifetimes.

Fig. 2 explains the working of agent based addressing protocol. It shows that address agent has an allocation table and every node which joins the network request AA for the address. Address agent checks the allocation table for the free address and allocate it to the requesting node.

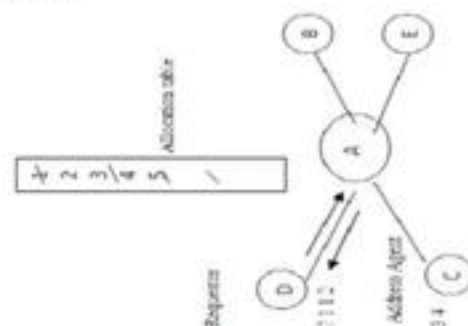


Fig. 2: Agent Based Addressing

The AA send the "Verify" packets periodically that contain assigned addresses .

When a node having the same address receives a Verify packet, it responds with a "Confirm" packet to indicate its presence in the network and to allow the AA to refresh the address entry lifetime.

When a new node enters into the network, it sends a unicast message to AA. When AA receives the request, AA builds a new 80 bits long IP address based on its MAC address and the requesting node's MAC address. Then it sends the IP address to the requesting node. Now, this new node can communicate with other nodes in the network.

This protocol guarantees the address uniqueness but the problem relies in the configuration of IP address. When a new node enters the network, it has no IP address to initiate the communication. This protocol does not clearly specify how to deal with this problem. At the same time the address generation is dependent on the MAC address of the AA which leads to unnecessary address changes whenever AA changes in case of network partitions, merges or AA departures.

As MANET consist of mobile nodes and address configuration scheme should be designed in such a way, that it should be able to deal with topology change, this protocol is not of good use.

DECENTRALIZED SCHEMES

In this scheme, nodes perform auto-allocation of IP address. It means each node randomly chooses its IP address. After that node performs Duplicate address Detection to ensure the uniqueness of address. A node already equipped with an IP address also depends on DAD to protect its IP address from being accidentally used by another node in the MANET. The following protocols are used which are based on decentralized scheme.

WDAD

WDAD stands for Weak Duplicate address Detection and according to *Sang Chul kim, 2008*, WDAD is used where ad hoc routing protocols detects duplicate address by modifying the routing protocol packet format. In this way, it lowers the overhead needed for the duplicate address detection. In this protocol, each node configures its IP address by its own and then checks whether that address is unique or not.

N. H. Vaidya, 2008 proposed the Weak DAD operation to make the packets route to the right destinations during the situation of more than two nodes assigned the same address.

In this, each node chooses an identification key which differentiates it with the node having same IP address. This key is used to detect duplicate address. Each node in the network maintains a routing table which contains IP address of each node along with the key. If a node receives the messages from the same IP address but different keys, it checks the routing table and marks the address entry as invalid.

SDAD

SDAD stands for Strong duplicate address detection. In this protocol, each node randomly selects an IP address and then checks whether the address has been used or not in the MANET. A node chooses two addresses called temporary and tentative address which are in the range of 169.254/16. A node uses temporary address and sends a request having tentative address as destination address. Then it waits for some time, if it gets a reply, it means that this address is already in use. If it does not get any reply, it repeats the process for a number of times. Otherwise, it can release the temporary address and adopts the tentative address.

According to *SangChul Kim, 2008*, SDAD is based on a reply for the claimed request, which needs to arrive at the node within a finite bounded time interval, the node can detect address duplication within the MANET.

Strong DAD operation can bring more overhead because it will broadcast control messages to the whole networks frequently, so if we can eliminate the Strong DAD operation, the overhead can be reduced more.

PDAD

PDAD stands for Passive Duplicate Address Detection which detects the duplicate address by continuously monitoring routing protocol traffic.

In MANETs, as the nodes are mobile, configured network can partition and merge. *Kilian Weniger, 2003* proposed that during network partitioning or merging, duplicate address can occur. To detect solve this situation, an efficient DAD should be used.

According to *DongKyun kim et al,2009*, in passive DAD schemes, instead of performing the explicit uniqueness checking, hints of address conflicts, which are derived by analyzing incoming routing protocol packets, are utilized to perform the address conflict resolution. *DongKyun kim et al,2009* in their next paper on improving accuracy of Passive DAD algorithms, proposed that in several passive DAD (denoted by PDAD) algorithms were introduced for proactive link-state routing protocols and on-demand routing protocols. In PDAD algorithms for proactive link-state routing

protocols, hints of address conflicts are derived when propagating a link-state routing table among nodes. In PDAD algorithms for on demand routing protocols, due to their passive nature, the DAD is also on-demand, and can detect address conflicts between nodes involved in a route discovery or maintenance procedure.

They introduced three algorithms such as PDAD-RREQ-Never-Sent (RNS), PDAD-RREP-Without-RREQ (RwR), and PDAD-2RREPs-on-RREQ (2RoR). However, in basic RNS and RwR schemes, it is assumed that only one of the nodes with the same address requested a route discovery procedure. Therefore, there should exist clear mechanisms to detect address conflicts as soon as possible when several nodes with the same address request their route discovery procedures simultaneously.

NEIGHBOR BASED SCHEMES

In this scheme, a new node is configured by its neighbor. This scheme overcomes the problem of centralized scheme as it does not suffer from centralized control or network wide flood. There are three protocols for address assignment which are based on this scheme.

MANETconf

According to *Sanket Nesargi et al., 2002*, when a node enters a network, it broadcast a query message to discover its neighbor who can initiate its configuration process. Here the new node starts a timer at the time of sending a request and waits for any initiator who is also the part of the MANET.

If it does not get any reply until the timeout expires, it repeats the process a threshold number of times waiting for at least one response to the request. If all the attempts fail (timer expiration), the requester concludes that it is the only node in the network and configures itself with an IP address. Thus, the MANET is initialized.

Prophet

Hongbo Zhou, 2008 proposed prophet address allocation utilizes a partition function $f(n)$ as a sequence generator to assign a unique IP address to a mobile node. In this, there is no need to maintain or synchronize allocation tables. Here each node maintains a partition function $f(n)$.

1. $F(n)$ is a stateful function with the initial state called the seed. Different seeds lead to different integer sequences. These sequences satisfy the following properties:

The interval between two occurrences of the same number in a sequence is extremely long;

2. The probability of more than one occurrence of the same number in a limited number of different sequences initiated by different seeds during some interval is extremely low.

When a new node wishes to join the network, it broadcasts a message to its neighbors. If it gets no response for its request, it assumes that it is the only node in the network. It chooses a random number as its IP address and uses a random state value as the seed for its $f(n)$.

If the new node receives many replies from its neighborhood, it contacts one of its neighbors for requesting an IP address. The requested node uses its partial function to generate another integer and a state value and send it back to the requesting node. After that, requested node updates its state accordingly.

When the requestor receives the integer, it uses it as its IP address and the state value as the seed for its $f(n)$. Now this new node is able to assign IP addresses to other new nodes.

The main issue of prophet address allocation is the design of the partition function $f(n)$.

For networks of realistic size, H. Zhou et al, 2003 proposed a generation function $f(n)$ based on a product of prime numbers with each prime raised to the power of the state value.

If R is the address space, then the generation function

$$f(n) = a + 2e_1 * 3e_2 * 5e_3 * 7e_4 \text{ mod}(R) + 1.$$

With 'a' is the IP address of the node generating the new address.

The problem occurs when different networks merge. Because there is no guarantee that the sequences (IP addresses and state values) in the merged networks are different or even they may have different generation functions, address duplicates could exist.

Buddy Protocol

In a Buddy System for IP address Assignment proposed by *Mansoor Mohsin, 2002*, each node has a set of IP addresses that it can assign to a new node without consulting any other node in the network.

In the beginning, there is only one node in the network that has the entire pool of IP addresses. When an un-configured node X, wishes to join a network, it requests the nearest configured neighbor node, Y, for an IP address. Node Y assigns an IP address to the requesting node X from its pool of IP addresses. It also divides the set of IP addresses into two and gives one half to the requesting node X.

A node can leave the network either gracefully Or abruptly. When node X leaves a network gracefully it gives its pool of IP addresses to any node Y nearby. Node Y has the responsibility of handling this set of IP addresses - it can either keep this block of IP addresses with itself or it can find the buddy of node X and forward this block of IP addresses to it. When a node leaves abruptly, it leads to IP address leak (because there is some IP address that is neither assigned to any node nor available for assignment to an un-configured node).

In this protocol,each node is responsible of a different allocation table constituted of a part of the whole address space. Therefore, Synchronization between all nodes is an essential part of the protocol to allow each node to build the whole address table.

This protocol generates no unnecessary address changes and the address assignment is only dependent on the involved initiator that is a neighbor of the requesting node, so it's less sensitive to network losses.

CONCLUSION

We have discussed different classification of address assignment schemes according to request made for an address from the node. Various requirements which should be considered while designing a protocol for autoconfiguration is also discussed.

Due to rapidly changing topology, power limitations, unpredictable link properties , security and routing strategies, there are still a scope for improvements in case of mobile ad-hoc networks.

REFERENCES

- [1] Dongkyun Kim , Hong-Jong Jeong, C. K. Toh (2009), " Passive Duplicate Address-Detection Schemes for On-Demand Routing Protocols in Mobile Ad Hoc Networks", IEEE, VOL. 58, P-3558.
- [2] Dongkyun Kim, Hong-Jong Jeong, Juan-Carlos Cano(2007) ," Improving the Accuracy of Passive Duplicate Address Detection Algorithms over MANET On-demand Routing Protocols", ISADS'07, IEEE.
- [3] Hongbo Zhou (2008) , "Secure Prophet Address Allocation for Mobile Ad-hoc Networks", 2008 IFIP International Conference on Network and Parallel Computing, IEEE, P-61.
- [4] H. Zhou, L. M. Ni, and M. W. Mutka(2003), "Prophet Address Allocation for Large Scale Manets," ,IEEE INFOCOM 2003 .
- [5] Killian Weniger(2003), " Passive Duplicate Address Detection in Mobile Ad Hoc Networks", IEEE, P-1504.
- [6] Killian Weniger and MaHina Zitterbart (2004), "Address Autoconfiguration in Mobile Ad Hoc ,Networks: Current Approaches and Future Directions", IEEE, P-6.
- [7] Li Ru , Ye Xin-min, Shi Jing-lin, Sun Jiang-ming, Wang Hao-hong(2009), "IP Addresses Auto-configuration in Global IP Connectivity of Mobile Ad Hoc Networks" , IEEE, P-479 .
- [8] Mansoor Mohsin and Ravi Prakash(2002) ," IP Address Assignment in a mobile adhoc network", IEEE MILCOM 2002, P-857.
- [9] M. Gunes and J. Reibel (2002), "An IP Address Configuration Algorithm for Zeroconf Mobile Multihop Ad Hoc Networks," , International workshop on Broadband wireless adhoc networks and services .
- [10] N. H. Vaidya (2002), "Weak duplicate address detection in mobile ad hoc networks," Proc. ACM MobiHoc 2002, P- 206.
- [11] Pan Wang, Douglas S. Reeves, and Peng Ning,(2005), "Secure Address Auto-configuration for Mobile Ad Hoc Networks" , MobiQuitous'05 , IEEE.
- [12] R. Droms(1997), "Dynamic Host Configuration Protocol", Network working group, IETF RFC 2131.
- [13] Sang-Chul Kim (2008)," An Adaptive Approach to Alleviate Broadcasting Redundancy in MANET Address Autoconfiguration Protocols", Third 2008 International Conference on Convergence and Hybrid Information Technology.
- [14] Sanket Nesargi, Ravi Prakash(2002), "MANETconf: Configuration of Hosts in a Mobile Ad Hoc Network", IEEE INFOCOM 2002, P-1061 .
- [15] S. Cheshire, B. Aboba and E. Guttman (2005), "Dynamic Configuration of IPv4 Link-Local Addresses", IETF RFC 3927.
- [16] S.Zahoor Ul Huq, Dr. K.E. Sreenivasa murthy (2010), " Analysis of efficient address allocation schemes in mobile adhoc networks", IISN:0975-5462, P-228.

individual can remember [1]. For example, domain names are used instead of IP addresses and telephone numbers are broken in to chunks for an individual to remember easily. It is also proved that individuals can remember images more easily than the text. The general tendency is that an individual may not remember text passwords easily and he may write it down. This can lead to stealing password to gain unauthorized access to a system.

Since passwords cannot be very long, they are easy to break using brute force attacks like attempting different passwords (online attack) or by offline attack on the password hash file. There are many other ways to break passwords like packet sniffing, by accidental discovery. Network traffic is easy to capture and analyze using the tools available in the web. Network protocol analyzers, such as Ethereal Packet Sniffer and tcpdump can be used to accumulate both incoming and outgoing network data including text based passwords.

Biometric based Authentication System

Biometrics, the application of statistical analysis to identify individuals through their biological or physiological characteristics, is emerging as a key aspect in new security systems. Using biometrics, it is possible to avoid pitfalls encountered with traditional security systems where users are required to keep information, such as passwords, safe [3]. Biometric authentication systems may be very safe and secure and reliable but these systems are costly and need additional hardware and software support. These systems are difficult to change and maintain. Deploying such systems for internet may be very complex and not suitable.

Image based Dual Level Authentication System (IBDLA)

IBDLA is a simple authentication system, which uses text password and image co-ordinates as passwords[5],[8]. The user submits user ID and choose 5 co-ordinates of an image as credentials to the system. If the text password and image co-ordinates matches with the one stored in the system, the user is authenticated. Certain locations of an image are easy to remember, which are stored in the form of co-ordinates. It is not easy to guess both text password and certain image locations. Performing brute force attacks on such systems is very difficult. A first time user has to register him with the system by providing all his details. The only difference comes when system asks him to click on any five locations on an image, which get stored as password. No major change is to be made to the existing password based systems to incorporate the use of images. The system remains simple as the password based one. The images are not stored in the system just the coordinates get saved. This system is easy to implement and we don't need any extra resource to implement it.

IBDLA was designed as an experimental security tool, which can be used in classroom for demonstrating basic security mechanisms or as an access control system in any of the applications needing authorization.

Implementation

Table 1

$i-1, j-1$	$i-1, j$	$i-1, j+1$
$i, j-1$	i, j	$i, j+1$
$i+1, j-1$	$i+1, j$	$i+1, j+1$

Algorithm

1. User Provide username and password
2. Password authenticator(PA) check its validity
3. If PA=1, goto step 5.
4. Else goto step 1
5. Now image authenticator(IA) verify the 5 preset locations.
6. If IA=1 User is Authenticated.
7. Else notify user(Your text password is compromised) and goto step 5

In this system we are authenticating text password. If the user successfully entered the text password, he will be asked for the image co-ordinated. If he entered the image co-ordinates correctly he will get sign-in otherwise he will be asked to re-enter the co-ordinates and if the user failed to do so he is not an authenticated user. In such case when user successfully pass the text password authentication level and failed to pass the second level of security, the system will tell the user that his text password is compromised and he should immediately change it. In this the user have to verify himself at two levels. If the attacker some how knows the text password and try to sign-in then user will get informed that someone knows your text password.

We are also intimating the user if $Y=1$ and $X=0$ that any of you password is compromised based on the true value of IA or PA. As, if only IA is true then only image password is compromised and if PA is true then text password is compromised.

ABSTRACTS

Becoming Entrepreneur by Outsourcing: A Case Study of Aligarh's Locks & Hardware Industry

Rohit Kumar

Asst. Professor, SD College of Management Studies, Muzaffarnagar

Abstract—People are now days do try to think differently and that's the reason why they want to do something extraordinary. Entrepreneurship is one of the fields where this different thinking is needed.

In this context, in this Research article, I have shown a number of ways by which a person can become an Entrepreneur and that too with a nominal amount of capital required. To study the current position of small scale industry, and the scope of being an Entrepreneur in some industry, I have selected Aligarh's Locks & Hardware Industry.

Keywords: Entrepreneurship, Small Scale Industry, Scope of Entrepreneurship.

Role of FDI in Retail Industry

Nipun Tyagi¹ and Anuj Jain²

¹Lecturer, Radha Govind Group of Institution, Meerut

²Student, MBA, Radha Govind Group of Institution, Meerut

Abstract—The Retail industry in India is one of the sunrise sectors in the economy. AT Kearney, the well-known international management consultancy, recently identified India as the 'second most attractive retail destination' globally from among thirty emergent markets. It has made India the cause of a good deal of excitement and the cynosure of many foreign eyes. With a contribution of 14% to the national GDP and employing 7% of the total workforce (only agriculture employs more) in the country, the retail industry is definitely one of the pillars of the Indian economy.

Given this backdrop, the recent clamor about opening up the retail sector to Foreign Direct Investment (FDI) becomes a very sensitive issue, with arguments to support both sides of the debate. It is widely acknowledged that FDI can have some positive results on the economy, triggering a series of reactions that in the long run can lead to greater efficiency and improvement of living standards, apart from greater integration into the global economy. Supporters of FDI in retail trade talk of how ultimately the consumer is benefited by both price reductions and improved selection, brought about by the technology and know-how of foreign players in the market. This in turn can lead to greater output and domestic consumption. Thus the present paper will discuss the role of FDI in retail industry with the comparison between certain factors of economy.

Keywords: FDI, Retail

Estimation of Software Reliability Growth Model Parameters

Virender singh¹, Anil Kumar² and Baba Mastnath³

¹Student, Baba Mastnath College of Engineering

²Student, Rajshstan Technical University

³Student, Baba Mastnath College of Engineering

Abstract—Whenever Software reliability estimates their parameters then we found that its growth model becomes useful. However, the estimation of parameter is normally done numerically, and hence actually existing amount of data is needed. This is frequently not fulfilled by modern development processes, as an example incremental development.

Software Reliability growth model represents a challenge for software testing engineers. This paper identifies three alternative ways of estimating the parameters in the models. Data from a case study of two software releases is used to example that how one parameter can be estimated from historical data. Thus, alternative ways of estimating the model parameters may be one way of making the models useful in modern development practices.

Keywords: Software Reliability

Foreign Direct Investment (FDI)—Boon or Bane in Present Financial Scenario

Vinod Kumar Chib

Prof., Jaipuria Institute of Management, Lucknow

Abstract—Any financial development needs huge capital infusion. Foreign capital, a scarce resource is always a welcome in the form of foreign direct investment (FDI). FDI plays effective role in development. The FDI fulfills the long term investment needs of the country. FDI investment directly results in the creation of business, employment generation, infrastructure development etc. Any short term fluctuation results in the flight of capital, visible in the crumbling of stock markets.

Recently, FDI in retail has been the most debated topic in the country. Higher the FDI in banking and insurance industry, the sectors will be more closely linked with the foreign turbulent financial markets and risks. This paper is an attempt to assess the impact of various challenges, the country may face in welcoming FDI.

Keywords: Foreign Direct Investment (FDI), Development, Economy, Impact, Challenges

Small and Medium Enterprises (SMEs)—Challenges Ahead

Vinod Kumar Chib

Prof., Jaipuria Institute of Management, Lucknow

Abstract—Entrepreneurship is creation and exploitation of knowledge that links technological possibilities to emerging market needs. Small and medium enterprises (SMEs) are playing crucial role in job creations, economic growth and GDP of the country. SMEs dare to venture in areas, generally untouched by corporates. Lucrative businesses force SMEs to jump into their dreamed business. SMEs primarily focus on the superficial visible profitability, ignoring the basics of business and suffer huge losses from day one.

Starting a new enterprise is always risky. Entrepreneur may raise funds, arrange best technology, but fails to perform. Even, SEBI is launching separate stock exchange for SMEs. Faulty planning, poor market assessments, high credit costs and wrong implementations spoil his dream project. High payouts in government's MNREGA schemes have hindered SMEs in villages. In this emerging age of SMEs, this paper discusses the challenges ahead for entrepreneurs.

Keywords: Financial Risks, Inefficient Labour, Credit Cost, Stiff Competition, Poor Infrastructure

Role of Media in Consumer Behaviour

Sumit Mukherjee and Mollshree

PGDM Student, NIILM-CMS, Greater Noida

Abstract—Digital media is profoundly transforming consumer behavior and traditional media business models. Teenagers are consuming more media, but in entirely different ways and are almost certainly not prepared to pay for it. Texting is still the key and use of new data services limited due to cost. Wi-Fi is more popular than 3G. In addition to viewing the web as an important and reliable research and communication tool, users often incorporate the medium into their decision-making process. In this study, media influence patterns have proved to be remarkably consistent from country to country, with Internet considered to be the most impactful medium, traditional electronic media receiving less attention and print media trailing the pack. While Internet users generally consider the Internet to be a reliable source of information, they tend to believe that many sources are better than one. Although mobile Internet use is growing, a significant gap exists between the capabilities available to mobile phone users and the number of individuals who actually take advantage of them. Overall, the web has the highest net importance of the media types included in the survey. Thus, various statistics shown above clearly depict that "Digital is the new core in the information processing system, being considered as the most reliable and fast source of information among various countries and different age-groups".

Keywords: Consumer Behavior, Data Services, Decision-Making Process, Digital Processing System, Media

Facial Expression Recognition

Arpita Nagpal and Kamal Kumar Ranga

Asst Prof., Ganga Institute of Technology and Management, Haryana

Abstract—Facial expressions are natural and can express emotions sooner than people verbalize their feelings. It conveys non-verbal cues, which play an important role in interpersonal relations. Facial expressions recognition technology helps in designing an intelligent human computer interfaces. In this paper facial expression recognition technique has been performed on the Indian faces. Initially, a live video of Indian college students is given as input to Haar classifier which traces out the faces from it. Then 42 facial feature points are detected using Active Appearance Model (AAM) technique. In the last step five primary facial expressions (neutral, happy, sad, surprise, angry) have been classified using the technique of the support vector machine (SVM). It was very a challenging task to integrate these techniques of artificial intelligence and obtain a reasonable performance. The facial expressions recognizer proposed here gave 83% accuracy.

Keywords: *Facial Expression, Support Vector Machine, Active Appearance Model, Haar Classifier, Classifier.*

Effects of Scouring Methods on Physical Properties of Rambouillet Wool

Alka Goel, Rashi Agarwal and Arpan Saxena

College of Home Science, G.B.P.U.A & T., Pantnagar

Abstract—Environmental consciousness mostly ranks high on the selection criteria of consumers with high buying potential of natural fibers. Wool is one of the oldest and most universally used natural textile fibers. Among the different kinds of animal fibers which were used in textile industry, wool from sheep is commercially the most important due to its inherent unique properties. Wool plays a pivotal role in textile industry. Rambouillet wool was selected for the study due to its easy availability in Uttarakhand. It is the largest of fine wool breed, rugged, adoptable to a wide variety of climatic condition and is long lived. It is warm, fine, soft and adds many processing advantage due to high crimp value.

Raw wool consists of many impurities i.e. sand, dust, twigs, vegetable matters as well as lanolin compound which make wool greasy. To remove out these impurities, processing was done which is known as scouring. Seven different methods of scouring were tried to scour the rambouillet wool fibers. Effect of seven scouring methods on various properties i.e. strength, elongation, fineness, diameter and whiteness index of wool fibers were assessed and comparison was also evaluated. Method VI of scouring was selected as the best/suitable out of seven different methods of scouring on the basis of visual evaluation and physical properties. Thus, to fulfill the market demand, to save the environment from pollution and to develop the rural economy, an attempt was made to explore the use of natural as well as eco-friendly textile fiber.

Keywords: *Rambouillet Wool, Scouring, Buying and Availability*

Corporate Social Responsibility

Divya Sharma and Kanika Tyagi

Student BBA, CMCA, TMU

Abstract—Corporate social responsibility has been assuming greater importance in the corporate world and become a pervasive topic in the business literature. Corporate Social Responsibility (CSR) refers to the unique relationship between businesses and wider society in general. Since this is a matter that becomes more and more important in the society of today we wanted to focus our study on small and medium sized enterprises to see how they can take part in the CSR implementation too. Recognizing the importance of CSR, there are voluntary guidelines on CSR for corporate. CSR guidelines pertain to areas, such as, care for all stakeholders, ethical functioning, respect for workers' rights and welfare, respect for human rights, environment and social and inclusive development. The final conclusion is that the most important stakeholder of when implementing CSR is the employees. A clear goal, vision and mission from the top

managers are crucial to implement *CSR efficiently*. We are confident that each small thing that we do today will contribute to a bigger change for a brighter tomorrow.

Keywords: Corporate Social Responsibility, Ethical, Stakeholders, CSR Guidelines

Simulation based Performance Analysis of AODV and AOMDV

Deepchand Jaiswal

PG Scholar in LNCT-Bhopal, Electronic & Comm. Department

Abstract—Mobile Adhoc Networks are the networks whose topology changes randomly with time. Design of robust routing algorithms that adapt to the frequent and randomly changing network topology is needed for MANETs. A variety of routing protocols have been proposed and several have been extensively simulated. In this paper, the performance of two types of On demand routing protocols- Ad-hoc On-demand Distance Vector (AODV) routing protocol, which is uni-path and Ad hoc On-demand Multi path Distance Vector (AOMDV) routing protocol is evaluated and compared. On comparing the performance of AODV and AOMDV, results show that AODV incurs more normalized routing load and delay than AOMDV but it had a better efficiency in terms of packet delivery ratio.

Keywords: Mobile Adhoc Networks, Routing Protocol, Performance, AODV And AOMDV

Implementation of Cloud Computing for Improving the Quality of School Education in Rural Part of India

Gaurav Bhatia

Student B.E., Gyan Ganga Institute of Technology and Sciences, Jabalpur (M.P)

Abstract—Indian education system has been divided into 4 levels at school and 3 levels in higher college level education. In the year 2011-2012 Government of India has provided Rs fifty three thousand crores to Ministry of Human Resources development for uplifting the education system in India. Although similar budgets have been allotted by the government previously in many years to improve the education system but in spite of that one fourth population of the country is still uneducated and in this figure educated means number of peoples who have passed their school, if we check for college level then this percent again going to reduced. The situation also gets worse when we enter the rural area of the country. The scope of college level and professional courses like engineering and medical or MBA etc is not there but the education system of primary level, middle level or higher secondary level is not up to the mark. The lack of qualified teachers, materials, books and latest version of technology is not there. With my paper I would like to introduce a system with the help of cloud computing technology which not only overcome these drawbacks but also helps in providing quality education to the children living in smaller cities or rural parts of the country and enhance not only their capabilities but it's also helps to teach them job oriented small courses that will help them to sharpen their skills during their school education only and thus the goal to provide quality education to each and every citizen of India will be fulfilled.

Keywords: Cloud, Education System, Cloud Architecture, Cloud Strategy, Education Cloud.

Resurging India Myths and Realities

Nimisha

Asst. Prof., IMT Kashipur

Abstract—Optimism is the key word in all the corners in terms of GDP growth, reasonable inflation, rural upliftment, education for all and list goes on. All these factors reflect towards much speculated vision of India becoming one of the top economies in the world in two decades. Giving a serious thought and examining the overall scenario in India, facts and figures which come across are just opposite the common perception. We must accept the fact that despite all the massive opportunities available in India, corruption, graft and most importantly policy paralysis have kept India in a low profile in all these sectors. Undoubtedly denizens living in metros and areas in the vicinity depict healthy picture of India but at the same time people living in far flung areas are devoid of basic necessities. In the name of development millions of rupees are misappropriated making the poor more poorer but projected picture given by the nexus of politicians and

bureaucrats are always very encouraging and positive. India's dream to become one of the best economies may come true by effective governance and proper planning and its implementation efficiently.

Keywords: Optimism, Inflation, Graft, Nexus

A Study of Uses of Agent based Application in Distributed and Virtual Environments

Rashmi Priya

Research Scholar, TMU

Abstract—There are wide varieties of agents such as learning agents, planning agents or communicative agents. One of the youngest members in the family are mobile agents, which provides us with interesting feature of mobility in order to perform their tasks in different machines. In this paper, we will see some of the current uses of mobile agents and we will suggest how we could use these agents in distributed and virtual environments. This research will help to enhance their uses and open a new world of possibilities for the users of these applications.

Keywords: Traffic control, workcells, application, commerce, telecommunication.

UID (Unique Identification Number)

Devna Jain and Rachit Jain

Student, CMCA, TMU

Abstract—Identification is always a necessity of human life. Although time can only tell about the efficiency of the project, but the very launch of this exercise has made it the largest biometric based identity disbursing e-government project in the globe. This paper, tries to put the current UID project of India into a perspective to evaluate the set of issues and concerns, as pointed by various stakeholders and try to understand the degree of criticality of those arguments. In this light, the areas of concerns around the UID project in India are also being pointed out. Given the largest IT project in nay government globally, the topic is of immense significance besides being timely and the discussion can provide impetus to a series of research activities in the areas of public policy, Information Systems planning and execution as well as appreciating the risks that get associated with such large initiatives.

Keywords: (U.D.A.I), (R.G.I), National Population Research, Biometric Solutions.

Small and Medium Enterprises—The Growth Engine of India

Manisha Jain

Student MBA, TMIMT

Abstract—India has transformed from a largely agrarian society to an industrial economy. Small and medium enterprise sector occupy an important and strategic place in economic growth and development in Indian economy and it contributes about 90% of the total development. It makes many sectors and the economy self-reliant in order to maintain the surging wave of progress. SMEs sectors emphasize on the traditional techniques, skills and traditional knowledge and ideally transformed into an Industrial economy. SME sector will make significant contributions to the employment generations, poverty reduction and also to be rural industrialization. These sectors are the roots of the growth and development of Indian economy. There is every need of creating awareness of technology upgradation and adaptability of changing trends. India is a country that encouraged innovations and change. Small and medium sectors are the driving force behind a large number of innovations and contribute to the growth and overall development of the economy.

Keywords: Industrialization, Self-reliant, Employment generations, Innovations, Technology.

Role of Small and Medium Enterprises in the Economic Development of India

Manoranjan Pandey

Student, CMCA, TMU

Abstract—Small and Medium Enterprises play very important role in socio-economic development of our country on account of their inherent advantages like low capital requirement, high employment generation, decentralization of industrial activity, utilization of locally available resources and widening of entrepreneurial base. This sector is the second largest manpower employer, after agriculture, in our country. Small and Medium Enterprises (SMEs) play a vital role for the growth of Indian economy by contributing 45% of industrial output, 40% of exports, employing 60 million people, create 1.3 million jobs every year and produce more than 8000 quality products for the Indian and international markets. SME's Contribution towards GDP in 2011 was 17% which is expected to increase to 22% by 2012. There are approximately 30 million MSME Units in India and 12 million persons are expected to join the workforce in the next 3 years. SMEs are the fountain head of several innovations in manufacturing and service sectors, the major link in the supply chain to corporate and the PSUs. By promoting SMEs, the rural areas of India will be developed.

Keywords: SMEs, Economic Development, India

Security Requirements and Solution for Vehicular Ad-Hoc Networks

Virender Singh¹, Anil Kumar² and Kuldep³

¹Student Baba Mastnath college of Engineering

²Student, Rajasthan technical university

³Student, U.J.E. T. MDU

Abstract—Inter-vehicle communication is one of the most challenging research areas for communication in wireless ad hoc and sensor networks. The main benefit of this kind of communication is seen in active safety systems, which aim at increasing passengers' safety by exchanging warning messages between vehicles. In the past few years, considerable effort has been spent in research on networking protocols and applications, however research on security threats and solutions only started recently.

In this paper, we elaborate on security issues in vehicular ad-hoc networks (VANETs) regarding active safety applications. We provide an overview on solution concepts and evaluate requirements of corresponding mechanisms. One conclusion is that although some concepts can be viewed as strong solutions from a network point of view, they do not fit into the design constraints of VANETs. Therefore, less secure mechanisms will probably have to suffice.

Keywords: Security Requirements, Vehicular Ad Hoc Networks

Role of FDI in Indian Economy

Suman

Assistant Professor, Haryana College of Education, Ellenabad, Sirsa

Abstract—FDI becomes a very sensitive, hot and debatable issue nowadays in Indian politics and financial sectors. No doubt FDI has immense contribution to the economy. In this context, the paper attempts to analyze the issues and challenges concerning the foreign direct investment in the Indian economy. The findings of the study point out that FDI in Indian market undoubtedly enhance the Indian growth but also raise few issues which discussed in this paper. India is latecomer to the FDI as compared to other fast developing countries. India is attractive favorable destination for foreign investors due to its high growth rate and huge market potential. This article aims to examine the issues and challenges of inward FDI on the Indian economy, particularly after a decade of economic reforms, and analyzes the challenges to position itself favorably in the global competition for FDI.

Keywords: Foreign Direct Investment, Issues, Challenges, Retail

Corporate Social Responsibility-Different Fabrics

Richa Manocha and Hareem Tariq

Asst. Prof., Amity School of Business

Abstract—This paper focuses on the different CSR activities performed by major players in the retail industry in India and abroad. It also talks about customers' preference for a company which abides by CSR activities as they feel associated in being part of the CSR activities. This practice not only makes organizations rich in their goodwill but also improves its relations with all the stakeholders associated with the company, customers would prefer companies active in CSR activities as in some way they also get associated with the cause, shareholders value more such companies and thus build trust in such companies.

It also represents the role of employee engagement to achieve sustainability of CSR issues within an organization. The paper also emphasizes on importance of CSR communication. It shows how can being open to scrutiny of customers or being transparent help the organization in enhancing goodwill.

Thus the paper focuses on all the aspects associated when a company is actively participating in improvement in its environment, surroundings, etc.

Keywords: Goodwill, Corporate Social Responsibility, Environment, Customers.

RTI in Corporate Governance—Myths and Realities

Prachi Saxena

Student, Tmimt

Abstract—Every citizen of our country gives tax. Even a beggar when he buys any small product. Thus, every citizen has the right to know where this money goes? Thus, Right to Information act was enacted on 12 October 2005 by the Parliament of India. Undoubtedly, RTI Act is a "PUBLIC ACT". It helps citizens to access information. But RTI brings transparency and accountability only Government sector. RTI act as a whistle blower and helps citizens to access information on Government sector. Corruption is not a monopoly of Government, it also exist in corporate world. There are many frauds exist like SATYAM, ENRON etc. Information should be disclosed even in corporate to the persons who are attached to it in one form or another. India should follow RTI in corporate too. India will not a new country which will follow RTI in corporate instead there are 19 countries which already using RTI Act in both public and private sector.

Keywords: RTI, Corporate, Transparency, Accountability, Whistle-Blower, Public Act

Ad-Hoc Network

Aarti Nandwani

TMU Research Scholar

Abstract—Ad-hoc network play a vital role in the present scenario at work and public places. As the need of the ad-hoc network is increased simultaneously need to protect such network is also increased. In case of security of information on network Encryption algorithm are always important. These algorithms take a significant amount for processing and increased overhead on CPU, memory; and battery. In this paper we studies the time used by varies encryption algorithm used in MANET to encrypt and decrypt at different settings for each algorithm. These settings include different sizes of data blocks, different data types (e.g. images, text, etc.) ; and the most important different key size, that will conclude the speed of encryption and decryption. The experiments outcomes shows the comparative study and superiority of applied algorithms and will help in design of new security protocol to improve the Quality of Service in MANET on WINS node.

Analysis of Customer Attitude towards e-Shopping with Special Reference to Allahabad

Devesh Ranjan Tripathi

Assistant Professor, Business Administration, School Of Management Studies, UP Rajarshi Tandon Open, University Allahabad

Abstract—The expansion of multidimensional trade, internet and World Wide Web provides corporates of new vistas of business mix. Growing companies can establish websites that rival or better their larger rivals. Present horizon of LPG era, increase the usage of ICT in our busy and fast life, this fueled expansion of e-shopping. e-shopping is a modern business mix that addresses the need of organizations, merchants and consumers to cut cost while improving the quality of goods, services and increasing the speed of delivery. It is associated with buying and selling of information, products and services via using internet technologies to transform the way key business processes are performed both wholesale and retail. The best part of it is that the SMEs and tiny enterprises can have the same exposure as the big players, today and in the future.

Keywords: - E-shopping, ICT, LPG, SMEs, Hostile

Microfinance Bank-SHG Linkage and Women Empowerment: The Success Stories

Arpita Sharma

Lecturer, Amity Business School, Amity University Rajasthan

Abstract—Microfinance is emerging as a powerful instrument for poverty alleviation in the new economy. Microfinance programmes like the Self Help Bank Linkage Program in India have been increasingly promoted for their positive economic impact and the belief that they empower women. Self Help Group (SHGs)-Bank Linkage Programme as a cost effective mechanism for providing financial services to the "Unreached Poor" which has been successful not only in meeting financial needs of the rural poor women but also in strengthening collective self help capacities of the poor leading to their empowerment. Rapid progress in SHG formation has now turned into an empowerment movement among women across the country. Economic empowerment results in women's ability to influence or make decision, increased self confidence, better status and role in household etc. Micro finance is necessary to overcome exploitation, create confidence for economic self reliance of the rural poor, particularly among rural women who are mostly invisible in the social structure. The study strongly demonstrate that on average, there is a significant increase in the empowerment of women in the SHG members group. The elegance of the result lies in the fact that the group of SHG participants show clear evidence of a significant and higher empowerment.

To populate the co-ordinates we are saving the surrounded pixel coordinates as follows. For co-ordinates (i,j) we are storing co-ordinates $(i-1,j-1)$, $(i-1,j)$, $(i+1,j+1)$, $(i,j-1)$, $(i,j+1)$, $(i+1,j-1)$, $(i+1,j)$, $(i+1,j+1)$.

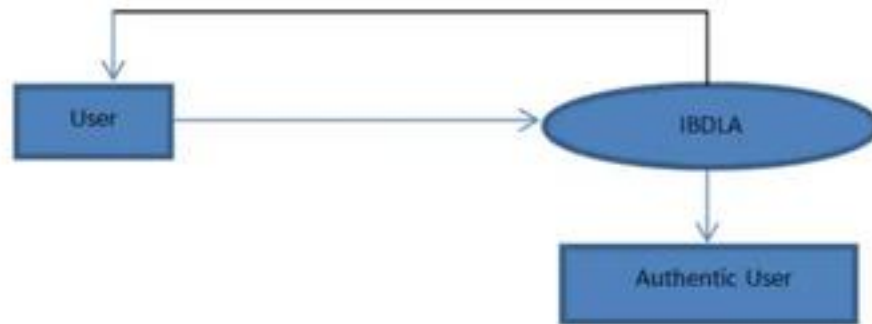


Fig. 1

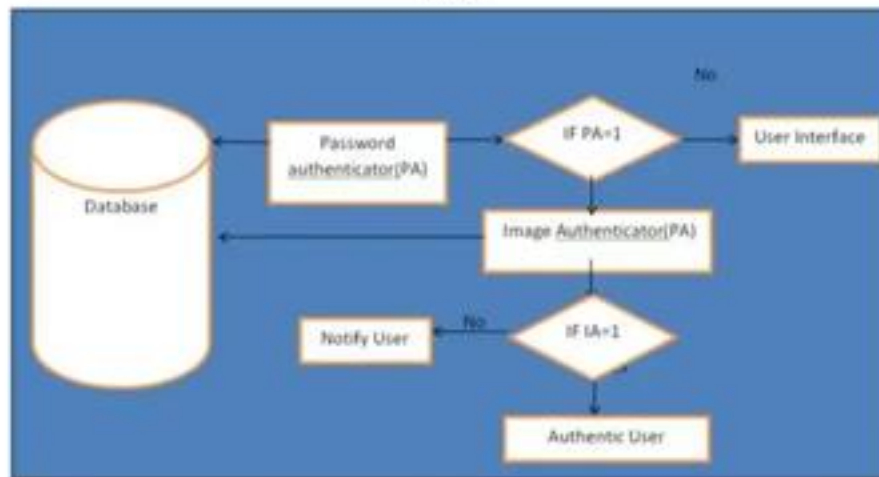


Fig. 2

CONCLUSION AND FUTURE ENHANCEMENTS

In this paper we proposed integrating text based passwords with images to strengthen the security of systems. We briefly discussed how the proposed authentication system could help enhance existing popular systems. This design can be further improved to enhance security. The IBDLA tool can be very well developed to perform role based access control. The database can be maintained as relational database by connecting the system to the database using JDBC connectivity. Our future work would focus on improving the database by providing the relentless storage. Our present system is developed as a stand-alone application. It can also be deployed on the Internet easily. It can be incorporated with simple biometric systems to enhance the security of the system.

REFERENCES

- [1] G.A. Miller, "The Magical Number Seven, Plus or Minus Two: Some limits on our Capacity for processing Information", *The Psychological Review*, vol. 63, pp. 81–97, 1956.
- [2] Art Conklin, Glenn Dietrich, Diane Walz, "Password-Based Authentication: A System Perspective", *Proceedings of the 37th Hawaii International Conference on System Sciences–2004*.
- [3] Ross A.J. Everitt, Peter W. McOwan, "Java-Based Internet Biometric Authentication System", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, pp. 1166–1172.
- [4] Takada Tetsuji, Koike Hideki, "Awase-E: Image-based Authentication for Mobile Phones using User's Favorite Images".
- [5] Dhamija Rachna, Perrig Adrian, "Déjà Vu: A User Study Using Images for Authentication", *9th Usenix Security Symposium*, August 2000.
- [6] Hyun-Sung Kim, Sung-Woon Lee, Kee-Young Yoo, "ID-based password authentication scheme using smart cards and fingerprints", *ACM SIGOPS Operating Systems Review*, Volume 37, Issue 4 (October 2003), Pages: 32–41.
- [7] Michael Burrows, Martin Abadi, Roger Needham, "A logic of authentication", *ACM Transactions on Computer Systems (TOCS)*, Volume 8, Issue 1 (February 1990), Pages: 18–36.
- [8] Trevor Pering, Murali Sundar, John Light, Roy Want, "Photographic Authentication through Untrusted Terminals", *IEEE Pervasive Computing*, January 2003, pp. 30–36.

Author Index

- A**garawl, Manoj, 232
Agarwal, Ambuj Kumar, 235
Agarwal, Bosky, 148
Agarwal, Rashi, 523
Agarwal, Shipra, 189
Aggarwal, Shalini, 187
Agrawal, Gaurav, 125
Akhtar, Mohd Anam, 299
Alam, Parvez, 304
Ali, Wajid, 385, 470
Aloney, Sacheen S., 192, 241
Anand, K.B., 95
Aneja, Sahil, 440
Anthwal, Tushar, 48
Arya, Satyendra, 156
- B**ansal, Alpna, 50
Bansal, Gaurav, 270, 276
Bansal, Shalini, 148
Baruah, Nabanita, 263
Baskaran, R. Vijaya, 487
Batra, Seema, 354
Belwal, Rajendra, 437
Bertsch, Andy, 3
Bharadwaj, Yogendra Pal, 304
Bhardwaj, Gurendra Nath, 109
Bhatia, Gaurav, 524
Bhatia, Megha, 204
Bhutani, Mohit Mayunk, 440
Bishnoi, Ashish, 45
Bisht, Kavita, 102
Bose, Indranil, 286
- C**handola, Akanksha, 48
Chaudhary, Priyanka, 128
Chauhan, Neeraj, 481
Chauhan, Surbhi, 165
Chawla, Chanchal, 467
Chhabra, Bharti, 381
Chib, Vinod Kumar, 522, 522
Cohen, Matthew, 3
- D**eepak, Nitin, 410
Dhiman, Pooja, 401
Dixit, Shikha, 133
Dutta, Madhulika, 209
Dwivedi, Surbhi, 68
- G**angal, Vijay Kumar, 119
Garg, Rakhi, 90
Garg, Shikha, 50, 73
Garima, 335
Ghosh, Ambarish, 143
Goel, Alka, 523
Goel, Amit Kumar, 319
Goel, Bhawana, 102
Goel, Neetu, 35
Gola, Kamal Kumar, 391
Goswami, Preeti, 329
Govil, Kapil, 367
Goyal, Vinay, 417
Gupta, Amit, 467
Gupta, Dhanshree, 32
Gupta, Ganesh, 16, 406
Gupta, Lalit Mohan, 493
Gupta, Madnesh Kumar, 406
Gupta, Mohan Vishal, 481
Gupta, Palak, 57
Gupta, Ravindra Kumar, 375
Gupta, Richa, 401
Gupta, Rupesh Kr., 136
Gupta, Shachi, 165
Gupta, Shivani, 238
Gupta, Sonia, 100
Gupta, Subhash Chandra, 375
Gupta, Surendra, 238
- H**asan, Nazia, 148
- I**ndurwade, S.H., 192, 241
- J**ain, Amit, 417
Jain, Anuj, 521
Jain, Devna, 525
Jain, Madhur Raj, 445
Jain, Manisha, 525
Jain, Manjula, 204, 209
Jain, Mukta, 315
Jain, Parul, 282
Jain, Rachit, 525
Jain, Satish Chander, 309
Jain, Smrita, 179
Jain, Vibhor, 179
Jaiswal, Deepchand, 363, 524
Jha, Rashmi, 429

- Johari, Lalit, 41
Joshi, Manish, 467
Joshi, Mukesh, 21
Kamboj, Meenakshi, 401
Kapoor, Rajat, 396
Kapoor, Shalini, 28, 396
Kaushik, Shipra, 167
Khan, Abdul Tayyab, 324
Khan, Fawad Ali, 319, 324
Khan, Gulista, 32, 73, 391, 385
Khan, Khurram Ajaz, 299
Khanna, Roma, 165
Kuldep, 478, 526
Kulshrestha, Madhuram, 282
Kumar, Amit, 452
Kumar, Anil, 521, 526
Kumar, Brajesh, 290
Kumar, Deepak, 420
Kumar, Dharmendra, 125
Kumar, Harsh, 45
Kumar, Rohit, 521
Kumar, Sanjeev, 452
Kumar, Shishir, 410
Kumar, Sunil, 381
Kumari, Harish, 24
Mahajan, Kirti, 100
Mahajan, Nilesh, 100
Mahajan, Tusshar, 100
Manocha, Richa, 527
Mastnath, Baba, 521
Mathur, Sanjeela, 213
Maurya, Ramji, 102
Midha, Aditi, 213, 445
Minal, 115, 259
Mishra, Nidhi, 508
Mishra, Sandeep Kumar, 290
Mittal, Sushil Kumar Bharti, 420
Mollshree, 522
Mondal, Pratibha, 423
Mudgal, R.K., 286
Mukherjee, Sumit, 522
Mulkikar, Jeeendra N., 174
Nagpal, Arpita, 523
Nandwani, Aarti, 527
Narang, Paridhi, 167
Narula, Pooja, 50
Nath, Padmini Ravindra, 152
Nimisha, 524
Ondracek, James, 3
Pahariya, N.C., 282
Paliwal, Minakshi, 251
Panday, Suruchi, 359
Pandey, Babita, 109
Pandey, Manoranjan, 526
Pandey, Raksha, 513
Pandey, Sakshi, 508
Pandey, Shishir, 295
Paul, Jyoti, 339
Priya, Rashmi, 12, 525
Puri, Jyoti, 84
Rai, C.S., 406
Rai, Shiddharth Kumar, 266
Rajkumar, Avinash, 156
Rana, Shusma, 385, 470
Ranga, Kamal Kumar, 523
Rani, G. Vimala, 423
Ranjan, Rajeev, 470
Ranjan, Saroj, 182
Rao, A. Lakshmana, 344
Rastogi, Ajay, 452
Rawat, Garima, 189
Saeed, M., 3
Saini, A.K., 429
Sanghi, Neeraj, 270, 276
Saxena, Arpan, 523
Saxena, Ashendra Kumar, 232
Saxena, Mili, 152, 225
Saxena, Pankaj, 437, 527
Saxena, Shruti, 456, 513
Sengupta, Ishuita, 78
Sethi, Puneet, 88
Sharan, Hari Om, 32, 391
Sharma, Anand, 493, 502
Sharma, Anu, 95
Sharma, Arpita, 528
Sharma, Deepak, 78, 125
Sharma, Divya, 523
Sharma, Jyoti, 221
Sharma, Mukta, 62, 68
Sharma, Paritosh, 133
Sharma, Pradeep Kumar, 493, 502
Sharma, Ranjana, 481
Sharma, Satish C., 329

Sharma, Vaibhav, 32
Shrivastava, Uma V.P., 174
Siddiqui, Orooj, 324
Singh, Akanksha, 263
Singh, Kirti, 119
Singh, Malikhan, 502
Singh, Monika, 456, 513
Singh, Nidhidh, 493
Singh, Nidhish, 502
Singh, Praveen Kumar, 295
Singh, R.K., 456
Singh, Ranjeet Kumar, 16
Singh, Santosh Kumar, 16
Singh, Virender, 521, 526
Singhal, Mragank, 78
Singhal, Priyank, 460
Singhal, Shivangi, 350
Singhal, Vaishali, 198
Singla, Vandana, 401
Srivastava, Abhinav, 156
Srivastava, Abhinna, 266
Srivastava, Samir, 513
Suman, 526
Sumanjeet, 251

Sumit, 478
Taak, Neha, 136
Takkar, Gaurav, 143
Tariq, Hareem, 527
Tripathi, Devesh Ranjan, 528
Tripathi, Indu, 55
Tripathi, Ravindra, 299
Tripathi, Swastika, 198
Tripathi, Viksit, 198
Tyagi, Kanika, 523
Tyagi, Nipun, 521
Upadhyay, Amit, 41
Upadhyay, Vidya Varidhi 474
Verma, Nitin Kumar, 95
Verma, Sarita, 228
Verma, Swati, 73
Verma, Vandana, 228, 235
Vishnoi, Aditi, 228
वर्मा, मंजु, 246
वर्मा, राजीव, 246
Yadav, Vidushi, 171



61/28, Dalpat Singh Building,
Pratik Market, Munirka, New Delhi-110067
Tel: 91-11-2671 1755/ 2755/ 3755 Fax: 91-11-2671 6755
E-mail: publishing@excelpublish.com • Website: www.excelpublish.com

ISBN

Comparative Study of Different Operating Systems

Neetu Goel

Research Scholar, Rukmini Devi Institute of Advanced Studies

Abstract—Operating system is the interface between the hardware and the user (application program). It controls and coordinates the use of hardware among various application programs for various users [1]. This research aims at a comparative study of different operating systems that run on computers and are used in mobile technology. The comparison is based on the cost, ease of use, reliability, security and other such parameters. This paper is also focusing on the advantages and disadvantages of mostly common popular operating systems as well as their availability and usage share in the current IT industry.

Keywords: Operating System, Mobile Technology, Reliability, Security

INTRODUCTION

An operating system (OS) is a set of programs that manages computer hardware resources, and provides common services for application software. The operating system is the most important type of system software in a computer system. Without an operating system, a user cannot run an application program on their computer, unless the application program is self booting.

Operating systems are found on almost any device that contains a computer—from cellular phones and video game consoles to supercomputers and web servers.

TYPES OF OPERATING SYSTEMS

Real-time

A real-time operating system is a multitasking operating system that aims at executing real-time applications. Real-time operating systems often use specialized scheduling algorithms so that they can achieve a deterministic nature of behavior.

Single-user

Single-user operating systems, as opposed to a multi-user operating system, are usable by a single user at a time. Being able to have multiple accounts on a Windows operating system does not make it a multi-user system. Rather, only the network administrator is the real user.

Multi-tasking

When the operating system allows the execution of multiple tasks at one time, it is classified as a multi-tasking operating system. Multi-tasking can be of two types: pre-emptive or co-operative. In pre-emptive multitasking, the operating system slices the CPU time and dedicates one slot to each of the programs.

Distributed

A distributed operating system manages a group of independent computers and makes them appear to be a single computer. The development of networked computers that could be linked and communicate with each other, gave rise to distributed computing. Distributed computations are carried out on more than one machine. When computers in a group work in cooperation, they make a distributed system.

Embedded

Embedded operating systems are designed to be used in embedded computer systems. They are designed to operate on small machines like PDAs with less autonomy. Windows CE and Minix 3 are some examples of embedded operating systems.

Multiprocessing

Multiprocessor systems are designed to utilize and support more than one computer processor.

Based on the above table following graph shows the following feature available on the total number of operating system for example Multi-User feature is available in five operating systems.

Table 2: Different Types of Operating Systems with Examples

Category	Examples
Real Time	Chimera, Lynx, MTOS, QNX, RTMX, RTX, and VxWorks.
Single User	MS-DOS, Amiga OS, Windows 1.0
Multiple User	Linux, Unix, Windows 2000, Windows XP, MacOSX
Multi-Tasking	Unix, Windows 2000
Multi-Processing	Linux, Unix, Windows 2000
Distributed	Windows 2003, Linux
Embedded	PalmOs, Symbian Os

EXAMPLES OF OPERATING SYSTEMS

Windows

The most recent client version of Windows is Windows 7; the most recent server version is Windows Server 2008 R2; the most recent mobile version is Windows Phone 7. Some earlier versions of windows are:

Windows 1.0

Windows 1.0 was released in November 1985. The shell of Windows 1.0 was a program known as the MS-DOS Executive. Other supplied programs were Calculator, Calendar, Cardfile, Clipboard viewer, Clock, Control Panel, Notepad, Paint, Reversi, Terminal, and Write. Windows 1.0 did not allow overlapping windows. Instead all windows were tiled. Only dialog boxes could appear over other windows.

Windows 2.0

Windows 2.0 was released in October 1987. It featured several improvements to the user interface and memory management. Windows 2.0 allowed application windows to overlap each other and also introduced more sophisticated keyboard-shortcuts. It could also make use of expanded memory.

Windows 2.1

Windows 2.1 was released in two different versions: Windows/386, indows/286.

ADVANTAGES

1. Microsoft has made several advancements and changes that have made it a much easier to use Operating System.
2. Because of the large amount of Microsoft Windows users, there is a much larger selection of available software programs, utilities, and games for Windows.
3. Microsoft Windows includes its own help section, has vast amount of available online documentation and help, as well as books on each of the versions of Windows.

Disadvantages

1. Microsoft Windows can run between \$50.00-\$150.00 US dollars per each license copy.
2. Microsoft Windows has made great improvements in reliability over the last few versions of Windows.
3. Although Microsoft has made great improvements over the years with security on their Operating System, their Operating System continues to be the most vulnerable to viruses and other attacks.
4. Slows down after running 24 hours.
5. Very little actual control over your files (they get written all over the disk haphazardly and the file systems you see even in MS-DOS have little to do with reality necessitating frequent defragmentation).

LINUX

Linux was originally released on October 5, 1991. It is a computer operating system which is based on free and open source software. It runs on a wide variety of computer hardware, ranging from mobile phones, tablet computers, routers, televisions and video game consoles, to desktop computers, mainframes and supercomputers.

Advantages

Low cost

You don't need to spend time and money to obtain licenses since Linux and much of its software come with the GNU General Public License. You can start to work immediately without worrying that your software may stop working anytime because the free trial version expires. Additionally, there are large repositories from which you can freely download high quality software for almost any task you can think of.

Stability

Linux doesn't need to be rebooted periodically to maintain performance levels. It doesn't freeze up or slow down over time due to memory leaks and such. Continuous up-times of hundreds of days (up to a year or more) are not uncommon.

Performance

Linux provides persistent high performance on workstations and on networks. It can handle unusually large numbers of users simultaneously, and can make old computers sufficiently responsive to be useful again.

Network friendliness

Linux was developed by a group of programmers over the Internet and has therefore strong support for network functionality; client and server systems can be easily set up on any computer running Linux. It can perform tasks such as network backups faster and more reliably than alternative systems.

Flexibility

Linux can be used for high performance server applications, desktop applications, and embedded systems. You can save disk space by only installing the components needed for a particular use. You can restrict the use of specific computers by installing for example only selected office applications instead of the whole suite.

Compatibility

It runs all common Unix software packages and can process all common file formats.

Choice

The large number of Linux distributions gives you a choice. Each distribution is developed and supported by a different organization. You can pick the one you like best; the core functionalities are the same; most software runs on most distributions.

Fast and easy installation

Most Linux distributions come with user-friendly installation and setup programs. Popular Linux distributions come with tools that make installation of additional software very user friendly as well.

Full use of hard disk

Linux continues work well even when the hard disk is almost full.

Multitasking

Linux is designed to do many things at the same time; e.g., a large printing job in the background won't slow down your other work.

Disadvantages**Understanding**

Becoming familiar with the Linux operating system requires patience as well as a strong learning curve. You must have the desire to read and figure things out on your own, rather than having everything done for you.

Compatibility

Because of its free nature, Linux is sometimes behind the curve when it comes to brand new hardware compatibility. Though the kernel contributors and maintainers work hard at keeping the kernel up to date, Linux does not have as much of a corporate backing as alternative operating systems. Sometimes you can find third party applications, sometimes you can't.

Alternative Programs

Though Linux developers have done a great job at creating alternatives to popular Windows applications, there are still some applications that exist on Windows that have no equivalent Linux application.

Macintosh

Mac OS is a series of graphical user interface based operating systems developed by Apple. It was first released in 1984. From the beginning, Apple deliberately sought to as minimize by design the user's conceptual awareness of the operating system as such. Tasks that on other products required a more explicit working knowledge of an operating system would on a Macintosh be accomplished by intuitive mouse gestures and manipulation of graphical control panels. The intention was that the product would thus be more user-friendly and so more easily mastered.

Advantages**Security**

Mac OS users should be vigilant about strange files and never allow an application they aren't certain of admin access, but they don't need special anti-virus software.

Reliability

Because OS X was designed from scratch from the ground up, Mac OS is incredibly stable. Apple controls production from start to finish, so every part of a Mac is designed and tested to work together.

Ease of Use

Apple's known for hiring the best industrial and interface designers around, and it shows in the intuitive nature of the GUI. Like the OS's reliability, the OS's functionality is designed to just work. The attractiveness of the interface can't be discounted. Some scoff that looks aren't everything, but when you're spending 8 or more hours a day staring at a screen, it's a relief to spend that time staring at a well-designed screen.

Integration with Apple and Other Products

Mac OS will automatically recognize and work with any other Apple product, such as iPhone, Cinema Display, Airport, and iPad. On top of this, additional drivers are rarely needed for non-Apple products.

Mac OS Can Run Windows at the Same Time

Mac OS runs on Intel chips, which means you can run XP or Vista concurrently with Mac OS, with Boot Camp or Parallels software.

Mac OS X is safer and has no viruses

Yes, it is indeed true that, by not being vulnerable to any viruses, nor spywares, Mac OS x is much safer than Windows - even safer than Windows Vista. Until now, for example, it's impossible to steal online bank passwords on a Mac. Besides, Mac OS X's own architecture makes much more difficult network invasions.

Disadvantages**Price**

All that flashy secure reliable power comes at a price. Macs cost more than machines that run other operating systems, though publications like MacWorld occasionally run feature-to-feature comparisons and find that comparably-equipped Mac and other machines run about the same price. The result is you're paying a premium to have what is often the highest-end hardware on the market.

Gaming

If you're a computer gamer, Mac OS isn't going to do it for you. Boot Camp and Parallels will allow you to run games natively in Windows, but there may be a performance hit. Some games are produced for Mac OS, but the number is very small.

Fewer Software Options

Highly specialized software can be difficult to source for Mac OS, such as industry-specific applications, and businesses you work with may provide files in one of the few non-Mac OS formats left in the computer world, such as Microsoft Publisher.

SOLARIS

Solaris is a Unix operating system originally developed by Sun Microsystems. It superseded their earlier SunOS in 1993. Oracle Solaris, as it is now known, has been owned by Oracle Corporation since Oracle's acquisition of Sun in January 2010. Solaris is known for its scalability, especially on SPARC systems, and for originating many innovative features such as DTrace, ZFS and Time Slider. Solaris supports SPARC-based and x86-based workstations and servers from Sun and other vendors, with efforts underway to port to additional platforms.

Advantages**Performance**

Mainly because it is optimized to work with the SPARC, it gives better performance than the other alternatives available. You would find many of the Sun's server solutions running with the Solaris OS such as Netra series.

POSIX compliant environment

Solaris can be considered to be compliant with the POSIX environment which means a standard programming interface for developers.

Hon'ble Chancellor's Message

I am glad that College of Management and Computer Applications, Teerthanker Mahaveer University, is organizing a two day International Conference on "Resurging India—Myths and Realities" on March 17-18, 2012. The giant strides made by India in economic sphere be it overall economic growth, development in social and economic infrastructure consisting of besides other things roads, ports, banking, insurance, educational institutions and power plants has made citizens life more comfortable.

India having a population of 1.2 billion people provides huge opportunities for trade and investment to people and the corporate from India and abroad. The huge potentials for economic growth which India provide made people to claim that for sure India would be an economic superpower by few decades from now.

At the same time prevalence of massive poverty and unemployment, slums in urban areas, environmental degradation, shortage of power and corruption in public life leaves enough doubt to the claim that India is surging ahead.

I am sure that two day deliberations in different technical sessions will help participants in understanding the issues and suggest ways for overcoming the hurdles in the path to development and thus facilitating the process of making India economic superpower.

I am pleased to convey my warm greetings to all participants and hope that they will find the conference full of learning and enjoyment.

Suresh Jain

*Chancellor,
Teerthanker Mahaveer University, Moradabad*

Disadvantages

Incompatible

It is not recommended to run Solaris on other architectures such as Intel, AMD. It is possible to install Solaris on Intel however, the performance would degrade considerably since Solaris cannot make use of Intel that efficiently.

Lack of good GUI

Solaris does have GUI support - Common Desktop Environment, Open Windows etc. but they are far way from the other GUI environments seen in Windows or Mac.

Costlier

With other cheaper alternatives such as Linux available, it proves to be costlier to acquire a license of Solaris. Since it is intended to be used on SPARC so the end user often ends up in buying the hardware as well.

MOBILE TECHNOLOGY OPERATING SYSTEMS

Android

Android is an operating system for mobile devices such as smart phones and tablet computers. It is developed by the Open Handset Alliance led by Google. Google released most of the Android code under the Apache License, a free software license. Android consists of a kernel based on the Linux kernel. Android uses the Dalvik virtual machine with just-in-time compilation to run compiled Java code.

2.3 Gingerbread refined the user interface, improved the soft keyboard and copy/paste features, improved gaming performance, SIP support (VoIP calls), and added support for Near Field Communication. Android 2.3 Gingerbread is the latest Android version that is available to phones.

3.0 Honeycomb was a tablet-oriented release which supports larger screen devices and introduces many new user interface features, and supports multicore processors and hardware acceleration for graphics. The Honeycomb SDK has been released and the first device featuring this version, the Motorola Xoom tablet, went on sale in February 2011.

3.1 Honeycomb was announced at the 2011 Google I/O on 10 May 2011. One feature focuses on allowing Honeycomb devices to directly transfer content from USB devices.

3.2 Honeycomb released at July 15 2011, is "an incremental release that adds several new capabilities for users and developers". Highlights include optimization for a broader range of screen sizes; new "zoom-to-fill" screen compatibility mode; capability to load media files directly from the SD card; and an extended screen support API, providing developers with more precise control over the UI.

Advantages

1. Android is a free operating system which lowers down the price of the handset.
2. It is designed to enable reuse of components in other applications.
3. It allows services to run in background.
4. High security is required.

Disadvantages

1. New Operating System and Also Not completely stable.
2. Android Linux-based system, so as to modify Andor, the user must know the commands on the Linux system, and should log on as administrator.
3. Not only is the installation of Program, each phone has a different way. The lack of compatibility all users of Android phones, we must learn again if Android phones to replace with other brands. Even to show any recovery mode, an Android phone has a different way.

BADA

Bada is an operating system for mobile devices such as smart phones and tablet computers. It is developed by the Samsung Electronics. It ranges from low-end feature phones to high-end smart phones.

Advantages

1. User interactive- Multi-touch, motion & sensors, face detection, weather-service etc.
2. Service-oriented features- Location based services, social networking, content sharing, commerce service etc.
3. Easy to use development environment

Disadvantages

1. The external sensor API is not open-ended, preventing new types of sensors or unexpected technology developments from being added in the future.
2. Due to "performance and privacy issues", Bada applications cannot access the SMS/MMS inbox or receive incoming SMS/MMS notifications.
3. Bada versions 1.x only allowed one Bada application to run at a time. Multitasking applications was only possible between the base applications and one Bada application. This limitation has been lifted since version 2.0

Table 3: Comparison Table

Name	Creator	Latest Version	Latest Release Date	Cost/ Availability	Preferred License	Market Share
Windows	Microsoft	Windows 7	2009	Home Basic \$99.95	Proprietary	86.57
Linux	Linus Torvalds	Linux kernel 3.0	2011	Free	GNU GPL, GNU LGPL and other licenses	1.04
Mac Os	Apple	9.2.2	2002	Bundled with 68K and PowerPC Macs;	Proprietary	6.04
MS Dos	Microsoft	8.0	2000	Free with Windows.	Proprietary	0.2
Solaris	Sun	10	2010	Commercial; a free 90 days evaluation version exists.	CDDL	0.1

LIMITATION

Research Paper includes only a few versions of an Operating system like windows, Linux, Mac Os etc. This Paper is also used in future to make comparisons between all the operating systems including all versions of an operating system either which are available or those upcoming in the future.

CONCLUSION

This paper mainly described the comparisons of different operating systems on the basis of their advantages and disadvantages, user preferences and market share that operating system captures. This also describes that depending on the priorities which operating system should be purchased. For example if operating system is to be purchased for a casual user then windows is preferred because of its GUI feature and for industries specially where security is one the major issue Linux is preferred. This paper also describes a comparison between mobile technology operating systems operating systems- Android and Bada.

REFERENCES

- [1] Silberschatz A., Galvin B. P., and Gagne G. (2010), Operating systems Concepts, 8th Edn., John Wiley and Sons, India
- [2] Prasad P. Balakrishna(2009), Operating systems, 2nd Edn., Scitech, India
- [3] Tannenbaum S. A., Woodhull S. A. and Woodhull,(2005), Operating Systems : Design and Implementation, 2nd Edn., Prentice Hall, India
- [4] Milenkovic M.(2001), Operating Systems : Concepts and Design, 2nd Edn., Tata McGraw Hill, India
- [5] "Mac OS X 10.6 Snow Leopard Installation and Setup Guide". Apple Inc. http://manuals.info.apple.com/en_US/Snow_Leopard_Installation_Instructions.pdf.
- [6] http://support.apple.com/kb/TA31885?viewlocale=en_US
- [7] http://www.operating-system.org/betriebssystem/_english/bs-msdos.htm
- [8] http://www.operating-system.org/betriebssystem/_english/bs-macos.htm
- [9] <http://www.computerhope.com/os.htm>
- [10] <http://www.apple.com/macosx>
- [11] Dhamdhere M. D. (2000), Systems Programming and Operating Systems, 2nd Edn., Tata McGrawHill, India

Reliable Confidentially Conserving Hierarchical Position Service for MANETs

Amit Upadhyay¹ and Lalit Johari²

¹Information & Technology Department, Sharda University, Greater Noida (U.P.), India

²School of Computer Engg. & App., IFTM University, Moradabad (U.P.), India

Abstract— Mobile Ad-Hoc Networks (MANET) has become an exciting and important technology in recent years because of the rapid proliferation of wireless devices. A mobile ad-hoc network consists of mobile nodes that can freely move in an open environment. Communicating nodes in MANET usually seek the help of the other intermediate nodes to establish communication channel. MANET is more vulnerable to attack than wired network as the open medium dynamically change network topology. In such environment malicious intermediate nodes can be the threat to the security of conversation between mobile nodes. Appearing in this paper we put forward a reliable confidentiality conserving hierarchical position service (RCCHPS) based on HLS algorithm applying the transmission encryption method and transmission validation method. In the proposed reliable position service method, the point seclusion of nodes is confined and sanctuary is assured.

Keywords: MANETs, Location Service, Security, Public Key Encryption

INTRODUCTION

Mobile Ad Hoc Networks (MANETs) are networks in which all nodes are mobile and communicate with each other via wireless connections. Nodes can join or leave at any time. All nodes are equal and there is no central control or overview. Ad hoc networks have become increasingly relevant in recent years due to their potential applications in bringing wireless connectivity in infrastructure less areas or to provide instantaneous connectivity free of charge inside specific user communities or geographic areas. In mobile ad-hoc networks there are no permanent infrastructure for instance base stations nodes server as the routers for each other, and data packets are forwarded from node to node in a multi-hop fashion also the nodes relocate rapidly and the network topology changes often. The suggested reliable confidentiality conserving hierarchical position service is illustrated in depth in Section 3. Section 4 concludes the paper.

PRELUDE

Position Service Model and Strike Model

A position service typically has two modules the position update and position request. There are three position service units in the common position service design:

1. Position Updater (PU) updates the position server with its present position information when required.
2. Position Server (PS) hoards the position information from the PU and respond to the position inquiry from the position asker
3. Position Requester (PR) launch request to the position server and attain the location information of the PUs.

Transmission Encryption Method

For shielding nodes location information transmission encryption method is used. The encryption method permits the position updater to steadily dispense its location information to an animatedly shifting cluster of position requester it relies over a transmit channel. In [8] the authors suggest a totally public key transmission method in which the trusted recipient is able to select the secret key by themselves. Moreover in the method new trusted recipient could be further included plus entrusted recipient could be purged from the recipient cluster. The method can be depicted as:

Key Creation

The sender circulates certain information I and trusted recipients arbitrarily decide their private keys PK_1, PK_2, \dots, PK_n (n is the number of trusted recipients) and calculates the equivalent public key K_1, K_2, \dots, K_n . The sender assembles the public key and calculates the system encryption key SK .

Transmission Encryption (TEnc)

The sender arbitrarily selects a session key s encrypts it with SK to formulate the enabling block $_ = TEnc(s, SK)$ and cipher block $C' = E(m, s)$. Ultimately it transmit $C = \langle _, C' \rangle$.

Translation

On getting the transmission C every recipient R_i translates it to $C_i = Con(SK_i, C)$.

Decryption

R_i decrypts the enabling block in C_i and PK_i to obtain the session key s and utilizes s to decrypt the cipher-text block and obtain the message m .

Add User

The sender generates the new system public key SK_{new} by the old one SK and the new recipient's public key SK_i .

Revocation

The sender gathers the presently trusted recipient's public key and recomputes the system public key in turn to remove the trusted recipients from the cluster.

Transmission Authentication Method

As the faulty packet insertion is feasible in the position service algorithm, a transmission authentication method is obligatory to allow the recipient to validate the legitimacy of the responses from the position server. Herein this piece we utilize the proficient transmission authentication method as in [9], which is an elegant one time signature method that permit the recipients to validate the transmitted messages from every sender. The method has no validation latency. Thus it's appropriate in lieu of our reliable confidentiality conserving hierarchy position service with regular position update and validation stage. The transmission validation is of three stages: preliminary stage, signing stage and validation phase. In support of competence the sender might allocate the subsequent public key created in the preliminary stage via validation transmission employing the old private key produced in the final preliminary stage [9].

SUGGESTED METHOD

Here we illustrate the suggested reliable confidentiality conserving hierarchical position services in aspect. Since the suggested method is directly formulated on the initial HLS algorithm we would stress on the position update and position request stage that are unlike the initial HLS algorithm.

Region Segregation and Reliable Units

Arrangement of hierarchy of sections in the suggested method RCCHPS is alike the initial HLS. A region of the ad-hoc network is segregated into units. The form and dimension of units could be elected randomly relating to the property of network. The units are clustered hierarchy within sections of dissimilar stages.

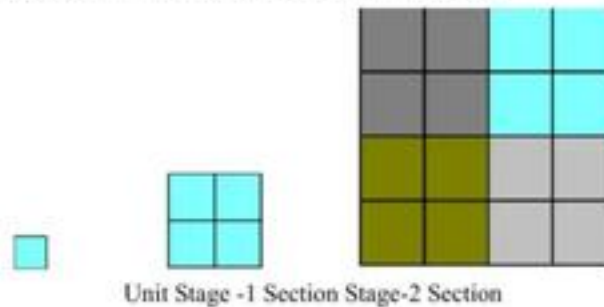


Fig. 1: Arrangement of Sections

The position information of a node N is cited in the group of units called reliable units (RSs) of N . While N launch an update packet to a random node inside or adjacent to a reliable unit S , this node happens to position server for N . A node N picks one reliable unit for every stage in the hierarchy by means of hash function [5]. For instance in Fig 1: $D1$, $D2$, $D3$ are reliable units of node N in the equivalent stage 1-3 sections regarding its present location.

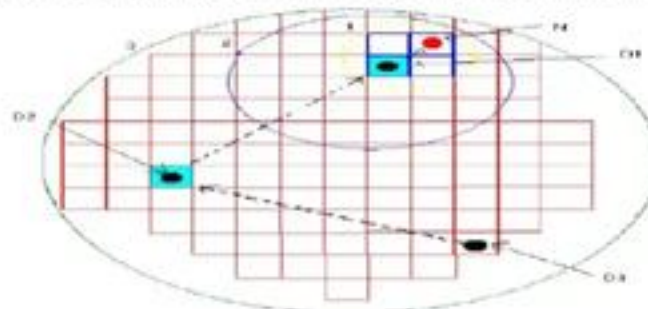


Fig. 2: Dependable Units of Node N

Position Update and Position Request

In the initial HLS, as the node updates its position servers the server would ascertain the unit which the node is at present in. Like shown in Fig 1 as node N updates the position server (in reliable units D1, D2 and D3) they would find out the unit presently in which N is. Therefore the position information of node N is out in the open and secrecy is awfully in danger. Besides, a malevolent node may exhibit itself to be node N and update the related position servers with flawed position information thus effecting the interaction among node N and others. Every node in the network is capable of finding the position information of node N by the position service. Here in this suggested RCCHPS we will utilize the transmission encryption and transmission authentication methods to defend the security and seclusion. The position revision scheduled in RCCHPS is unlike the initial HLS. In HLS method the node that shift outside of one unit would inform the position server in the RS of lowest stage-1 section by means of pointer indicating to the nodes existing unit and other position servers within the RCs of upper stage sections with pointers suggesting towards the RC of the subsequent lesser stage as in Fig.2 However in the suggested RCCHPS method to inform its position information node N do not launch the information packet to the position server within reliable unit D1 of stage-1 section in order conceal itself in larger region (region in blue circle in Fig.3) As an alternative, it inform the position server D2 through cipher text together with location information along with further position server of advanced stage by pointers suggesting towards the RS into subsequent lower stage. Certainly if node N wants extra advanced stage of discretion, then it can begin filling in from the position server in RS of stage-3.

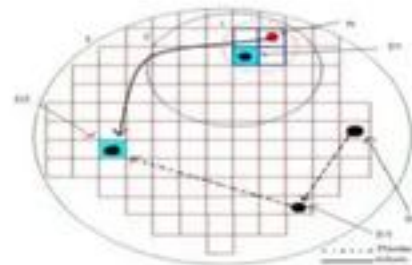


Fig. 3: Position Update

Node N produces the cipher text of its location information through transmission encryption method along with transmission authentication method. Cipher text is symbolized as in $(Y_N, TA(TE(c)))$ now Y_N is the identity of node N employed as catalog, TA specify the transmission authentication method, TE shows the transmission encryption method with c is message concerning node N's location. After that node N saves the chipper text into position server within RS of particular stage section that it chooses as the smallest stage section plus it inform the RSs of top stage section with pointer indicating to RS of subsequent lesser section when required. For effectively inquiring the existing position of objective node N, the call of a starting node K must be routed to position server that has the chipper text concerning node N's position information. Node K is familiar with configuration of entrant tree [5] described by means of hash function plus N, Y_N . Therefore the demand merely requires visiting every errant unit of the sections that hold K. The entrant unit of the section with smallest stage having K, N and chipper text is dependable unit along with the entrant unit of every top stage.

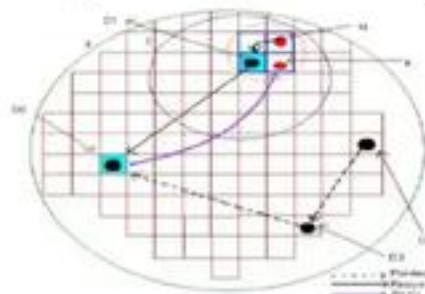


Fig. 4: Position Request

As in Fig.4 node N require to screen itself in stage-2 section (are in blue circle) thus at the time of informing the position servers it would save the chipper text regarding its existing position on the position servers within the dependable unit D2 of stage-1 section plus additional position server within dependable units of advanced stage similar to D3 and D4 by means of pointers. When starting node K needs to inquiry about the position of node N, it initially call for stage-1 dependable units D1 however node N as well as node K are within the alike stage-1 section, D1 doesn't have cipher text concerning node N's present position. After that, call would be send to dependable unit D2 in stage-2 section intended for position information. Furthermore D2 respond to node K through the cipher text concerning node N's present position information. After that node K validates the obtained cipher text and decodes the cipher block to acquire the position of node N. the validation algorithm and decryption algorithm is been depicted in section II

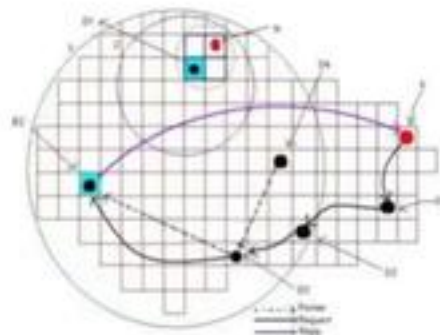


Fig. 5: Position Request

For instance perceive Fig.5. At time when node K along with node N exists within the same stage-3 section node K initially ask for entrant unit D1' of stage-1 section having K plus at hand nothing concerning the objective node N's position information, as a result the demand is send to D2' then in conclusion achieves stage-3 entrant unit D3 that has a pointer indicating towards the dependable unit that saves the cipher-text concerning the node N's position information. Subsequently the demand is send according towards pointer downwards towards stage-2 entrant unit D2 plus the position server in D2 respond to node K by means of cipher-text regarding node N's position information.

CONCLUSION

Security in MANETs is a new area of research with a limited but rapidly growing set of research results. Featuring in this paper we had presented a reliable confidentiality conserving hierarchical position service for topographical routing for MANETs. The suggested position service method deals with two significant problems in topographical routing i.e. seclusion and safety matters. Future research should concentrate on addressing the issue of modifying the authentication and encryption algorithms along with advancing the caching mechanism.

REFERENCES

- [1] Mauve, M., Widmer, J., Hartenstein, H.: A survey on position-based routing in mobile ad hoc networks. *IEEE Network Magazine* 15(6), 30–39 (2001).
- [2] Camp, T., Boleng, J., Wilcox, L.: Location Information Services in Mobile Ad Hoc Networks. In: *Proc. of IEEE ICC 2002*, New York City, New York, pp. 3318–3324 (April 2002).
- [3] Li, J., Jannotti, J., DeCouto, D.S.J., Karger, D.R., Morris, R.: A Scalable Location Service for Geographic Ad Hoc Routing. In: *MobiCom 2000. Proceedings of the sixth annual ACM/IEEE International Conference on Mobile computing and networking*, Boston, Massachusetts, pp. 120–130 (August 2000).
- [4] Xue, Y., Li, B., Nahrstedt, K.: A scalable location management scheme in mobile adhoc networks. In: *LCN'2001. Proc. of the IEEE Conference on Local Computer Networks*, Tampa, Florida (November 2001).
- [5] Kieß, W., Fügler, H., Widmer, J., Mauve, M.: Hierarchical location service for mobile ad-hoc networks. *ACM SIGMOBILE Mobile Computing and Communications Review* 8(4), 47–58 (2004).
- [6] Song, J.-H., Wong, V.W.S., Leung, V.C.M.: A framework of secure location service for position-based ad hoc routing. In: *Proceedings of the 1st ACM international workshop on Performance evaluation of wireless ad hoc, sensor, and ubiquitous networks*, Venezia, Italy, pp. 99–106.
- [7] Zhi, Z., Choong, and Y.K.: Anonymizing Geographic Ad Hoc Routing for Preserving Location Privacy. In: *ICDCSW 2005. Proceedings of the Third International Workshop on Mobile Distributed Computing (MDC)*, vol. 06 (2005).
- [8] Tan, Z.W., Liu, Z.J., Xiao, and H.G.: A fully public key tracing and revocation scheme provably secure against adaptive adversary. *Journal of Software* 16(7), 1333–1343 (2005).
- [9] Chang, S.-M., Shieh, S., Lin, W.W., Hsieh, C.-M.: An efficient broadcast authentication scheme in wireless sensor networks. In: *ASIACCS 2006*, Taipei, Taiwan (March 21–24, 2006).

A Novel Designing Methodologies for Artificial Intelligent Agents

Ashish Bishnoi¹ and Harsh Kumar²

¹Dept. Computer Application, CMCA, TMU, Moradaba¹

²Dept. Computer Science, Shri Venkateshwara University, Gajraula

Abstract—This paper reviews the current state of the art in the research concerning the designing of artificial intelligent agents. Intelligent agents offer a new and exciting way of understanding the world of work. Intelligent agents could offer potential for fostering sustainable organizational capabilities in the future. Intelligent agents are a new paradigm for developing software application. The concept of an agent has become important in both Artificial Intelligence (AI) and mainstream computer science. In this paper, we point the most theoretical and practical issues associated with the design of intelligent agents. For simplicity, we divide these issues into three areas – Agent theory is concerned with the question of what an agent is, and the use of mathematical formalisms for representing and reasoning about the properties of agents. Agent architectures can be thought of a software engineering model of agents. Finally, Agent languages are software systems for programming and experimenting with agents; these languages may embody principles proposed by theorist.

Keywords: Intelligent Agent, Artificial Intelligent, Semantics, Data Mining.

INTRODUCTION

Artificial Intelligence is one of the newest fields of intellectual research; its foundation began thousands of years ago. Artificial Intelligence is the study of systems that act in a way that to any observer would appear to be intelligent. Artificial Intelligence involves using methods based on the intelligent behavior of humans and other animals to solve complex problems. In 1956, the term Artificial Intelligence was first used by John McCarthy at a conference in Dartmouth College, in Hanover, New Hampshire. The aim of study of Artificial Intelligence is no longer to create a robot as intelligent as a human, but rather to use algorithms, heuristics and methodologies based on the ways in which the human brain solves problems. The mainstay of Artificial Intelligence research is the way to producing more and more useful intelligent computer systems. Proponents of strong Artificial Intelligence believe that a computer that behaves in an intelligent way is capable of processing mental states and, therefore, of being truly conscious and intelligent in the same way that humans are. Artificial Intelligence systems are used in a wide range of industries, from helping travel agents to select suitable holiday packages to enabling factories to schedule machines. Artificial Intelligence is particularly useful in situations where traditional methods would be too slow.

One of the objectives of Artificial Intelligence researcher's to develop software's which are intelligent enough to know the preference, habits of the user and customize the software according to user preferences so obtained. Software can perform these functions only with the help of various agents embedded in it. Commercial interest in technical field provokes a large movement and change in the focus of research objectives. For example, application of Artificial Intelligence techniques to distributed computer systems, company wide intranets, internet and the web. Initially focus is limited to information search, retrieval and filtering. But as more and more commercial transactions are performed on networks, there is more interest in having smart agents that can perform specific actions.

When given a goal, an intelligent agent could carry out the details of the appropriate computer operations and could ask for and receive advice, offered in human terms when it was stuck. [1]

An intelligent agent is a set of independent software tools linked with other applications and databases running within one or several computer environments. The primary function of an intelligent agent is to help a user better use, manage, and interact with a computer application. Intelligent agent can take decisions and perform certain tasks. In simple words, an agent can be described as an entity that is able to carry out some task, usually to help a human user. Agents embedded with the software are known as software agents. A software agent is a computer program designed to carry out some task on behalf of a user. A software agent may possess large number of properties, but the property with which we are particularly concerned is intelligence. A software agent having intelligence as its property is known as Artificial Intelligence Agent. Intelligent agents are the foremost requirement of developing intelligent systems and software's. The field of Artificial Intelligence as a whole can be seen as the study of methods that can be used to build intelligent agents. Intelligent agents can be very useful in different applications for different businesses as they are equipped with knowledge about the tasks they have to perform when the opportunity arises. In Artificial Intelligence, an intelligent agent (IA) is an autonomous entity which observes and acts upon an environment and directs its activity towards achieving goals. Intelligent agents may also learn or use knowledge to achieve their goals. They may be very simple or very complex: a reflex machine such as a thermostat is an intelligent agent, as is a human being, as is a community of human beings working together towards a goal.

Intelligent agents are often described schematically as an abstract functional system similar to a computer program. For this reason, intelligent agents are sometimes called abstract intelligent agents (AIA) to distinguish them from their real world implementations as computer systems, biological systems, or organizations. Some definitions of intelligent agents emphasize their autonomy, and so prefer the term autonomous intelligent agents. Still others (notably Russell & Norvig (2003)) considered goal-directed behavior as the essence of intelligent and so prefer a term borrowed from economics, "rational agent".

Intelligent agents in artificial intelligence are closely related to agents in economics, and versions of the intelligent agent paradigm are studied in cognitive science, ethics, the philosophy of practical reason, as well as in many interdisciplinary socio-cognitive modeling and computer social simulations. Intelligent agents are also closely related to software agents (an autonomous software program that carries out tasks on behalf of users). In computer science, the term intelligent agent may be used to refer to a software agent that has some intelligence, regardless if it is not a rational agent.[2] For example, autonomous programs used for operator assistance or data mining (sometimes referred to as bots) are also called “intelligent agents”.

CHARACTERISTICS OF INTELLIGENT AGENTS

An Artificial Intelligent agent should have the following properties:

1. **Intelligence-** An agent is a tool that carries out some task or tasks on behalf of a human. Intelligent agents have additional domain knowledge that enables them to carry out their tasks even when the parameters of the task change or when unexpected situations arise. For example, an intelligent agent might be designed to buy books for a user on the internet at the lowest possible.
2. **Autonomy-** If an Intelligent Agent, has the ability to act and make decisions independently of the programmer or user of the agent, then it is said to be autonomous. For example, an intelligent buying agent that is designed to buy goods on behalf of a user needs to be able to make decisions about what items to purchase without checking back with the user.
3. **Ability to learn-** When agent presented with new information, it is able to store that new information in a useful form. For example- Agents can learn from a user by observing actions or by being given instruction. Learning allows agents to improve their performance task over time.
4. **Cooperation-** Multiple agents usually cooperate with each other in multi agent systems. This cooperation implies some form of social interaction between agents. For example- a buying agent may negotiate with selling agents to make purchases. As has been mentioned, agents can also learn from each other. Although in most agent systems, this cooperation is in the form of simple inputs and instructions, the manner in which agents cooperate with people can be very important.
5. A versatile agent is one that is able to carry out many different tasks.
6. Most agents are benevolent but, some can be competitive or non helpful.
7. Some agents may be altruistic or antagonistic.
8. Some agents can have the ability to lie to other agents, or to users, where as other agents are always truthful, this property is known as veracity.
9. The extent to which an agent can be trusted with delegated tasks and whether or not they degrade gracefully.
10. An agent's mobility is defined by its ability to move about on the internet or another network.

Agent Theories

Agent theory regarded as a specification for an agent; agent theorists develop formalisms for representing the properties of agents, and using these formalisms, try to develop theories that capture desirable properties of agents. The philosopher Daniel Dennett has coined the term intentional system to describe entities ‘whose behavior can be predicted by the method of attributing belief, desires and rational acumen.’ Intelligent agent must have information attitudes which are related to the information that an agent has about the world it occupies. The pro-attitudes are responsible for guiding the agent's action. Agent theory also deals with determining the appropriate methods for representing and reasoning about intentional notions of the agent. There are two problems to be addressed in developing a logical formalism for intentional notions: a syntactic one, and a semantic one. There are two fundamental approaches to the syntactic problem. The first is to use a modal language, which are applied to formulae. An alternative approach involves the use of a meta language: a many-sorted first order language containing terms that denote formulae of some other object language.

The best-known and probably most widely used approach is to adopt a possible world's semantics, where an agent's beliefs, knowledge, goals, and so on, are characterized as a set of so-called possible worlds with an accessibility relation holding between them. A realistic agent theory will be represented in a frame work that combines these various components. Agent logic should be capable of representing the dynamic aspects of agency. A complete agent theory, expressed in logic with these properties, must define how the attributes of agency are related. For example- it should show how an agent's information and pro-attitudes are related; how an agent's cognitive state changes over time; how the environment affects an agent's cognitive state; and how an agent's information and pro-attitudes lead it to perform actions. Agents should track the success of their intentions, and are inclined to try again if their attempts fail.

Agent Architectures

In this section, we consider the issues surrounding the construction of computer systems that satisfy the properties specified by agent theorists. Maes defines agent architecture as: ‘A particular methodology for building agents. It specifies how the agent can be decomposed into the construction of a set of component modules and how these modules

should be made to interact'. [3] The total set of modules and their interactions has to provide an answer to the question of how the sensor data and the current internal state of the agent. Agent architecture encompasses techniques and algorithms that support this methodology.

The classical approach to building agents is to view them as a particular type of knowledge based system. We define a deliberative agent or agent architecture to be one that contains an explicitly represented, symbolic model of the world, and in which decisions are made via logical reasoning is highly seductive: to get an agent to realize some theory of agency one might naively suppose that it is enough to simply give it logical representation. There are at least two important problems to be solved when building an agent in this way-

1. The transduction problem: that of translating the real world into an accurate, adequate symbolic description, in time for that description to be useful.
2. The representation / reasoning problem: that of how to symbolically represent information about complex real-world entities and processes, and how to get agents to reason with this information in time for the result to be useful.

These problems have led to the development of what are generally known as reactive architectures. A reactive architecture is one that does not include any kind of central symbolic world model, and does not use complex symbolic reasoning. It specifies that intelligent behavior can be generated without explicit representations and abstract reasoning of the kind that symbolic artificial intelligent proposes. A reactive agent is capable of reacting to events that occur in the environment without engaging in complex reasoning.

Agent Languages

To develop an intelligent agent, we require an agent language (a system) that allows one to program hardware or software computer systems in terms of some of the concepts. An agent language must include some structure corresponding to an agent and attributes such as beliefs, goals, or other mentalistic notions used to program agents. Concurrent object languages are in many respects the ancestors of agent languages. The notion of a self contained concurrently executing object, with some internal state that is not directly accessible to the outside world, responding to messages from other such objects, is very close to the concept of an agent as we have defined it. A system should have three components for developing agents: 1. a logical system for defining the mental state of agents; 2. an interpreted programming language for programming agents; 3. an agentification process, for compiling agent programs into low-level executable systems. The development of various languages for agent-based applications is of undoubted importance and each was designed either to illustrate or examine some set of principles, and these languages were not, therefore, intended as production tools. Work is thus needed, both to make the languages more robust and usable, and to investigate the usefulness of the concepts that under pin them.

CONCLUSION

In this paper we reviewed the main concepts and issues associated with the theory and practice of intelligent agents. It provides an insight into what an agent is, how the notion of an agent can be formalized, how appropriate agent architectures can be designed and implemented, how agents can be programmed, and the types of applications for which agent-based solutions have been proposed. We discuss the ability of agents to autonomously plan and pursue their actions and goals, to cooperate, coordinate, and negotiate with others, and to respond flexibly and intelligently to dynamic and unpredictable situations will lead to significant improvements in the quality and sophistication of the software systems that can be conceived and implemented, and the application areas and problems which can be addressed.

REFERENCES

- [1] Allen, J.F. (1984). Towards a general theory of action and time: *Artificial Intelligence*, 23(2):123-154.
- [2] Russell, S., and Norvig, P. (2003). *Artificial Intelligence: A modern approach*, 2nd edition. Englewood Cliffs, NJ: Prentice Hall.
- [3] Maes, P., editor (1990a). *Designing Autonomous Agents*. The MIT Press: Cambridge, MA.
- [4] Bell, J. (1995). Changing attitudes. In Wooldridge, M. and Jennings, N. R., editors, *Intelligent Agents: Theories, Architectures, and Languages* (LNAI Volume 890), pages 40-55. Springer-Verlag: Heidelberg, Germany.
- [5] Doyle, J. and Reichgelt, H. (1991). A logic of relative desire. In Ras, Z. W. and Zemankova, M., editors, *Methodologies for Intelligent Systems-Sixth International Symposium, ISMIS-91* (LNAI Volume 542). Springer-Verlag: Heidelberg, Germany.
- [6] Goodwin, R. (1993). Formalizing properties of agents. Technical Report CMU-Cs-93-159, School of Computer Science, Carnegie-Mellon University, Pittsburgh, PA.
- [7] Haugeneder, H., Steiner, D., and Mc Cabe, F.G. (1994). IMAGINE: A framework for building multi-agent systems. In Deen, S.M., editor, *Proceedings of the 1994 International Working Conference on Cooperating Knowledge Based Systems (CKBS-94)*, pages 31-64, DAKE Centre, University of Keele, UK.
- [8] Shoham, Y. (1990). Agent-oriented programming. Technical Report STAN-CS-1335-90, Computer Science Department, Stanford University, Stanford, CA 94305.
- [9] Thomas, S.R. (1993). PLACA, an Agent Oriented Programming Language. PhD thesis, Computer Science Department, Stanford University, Stanford, CA 94305. (available as technical report STAN-CS-93-1487).
- [10] Vere, S. and Bickmore, T. (1990). A basic agent. *Computational Intelligence*, 6: 41-60.
- [11] Voorhees, E.M. (1994). Software agents for information retrieval. In Etzioni, O. editor, *Software Agents-Papers from the 1994 Spring Symposium* (Technical Report SS-94-03), pages 126-129. AAAI Press.

Implementation of Semantic Web in Social Computing: Review

Akanksha Chandola¹ and Tushar Anthwal²

¹Birla Institute of Applied Sciences, Bhimtal

²Amrapali Institute, Haldwani

Abstract—Semantic Web is an emerging concept in the associated with World Wide Web. There are several challenges in the path of implementation of Semantic Web also known as Web 3.0. As Social Computing is still evolving technology, thus giving meaning to it and managing the huge content of web in systematic form is major issue. In this paper we analysis pros and cons associated with the implementation of Semantic Web in Social computing and give a brief idea about some of the developments in this context.

Keywords: Semantic Web, Social Computing, Ontologies

INTRODUCTION

The Semantic Web is the name for the next WWW generation as very recently coined by the World Wide Web Consortium (W3C) and its chair Tim Berners-Lee [1]. The Semantic Web has attracted a diverse, but significant, community of researchers, institutes and companies, all sharing the belief that one day the it would have a big impact on social as well as economic computing world. The Semantic Web and Web 2.0 ideas are increasingly interweaving, Social Semantic Web applications are being developed. Such applications are, e. g., semantic wikis (Semantic MediaWiki, Kaukolu), semantic blogs (SemBlog), social semantic networks (People Aggregator) and social semantic information spaces (NEPOMUK). The Semantic Web is an effort to create new facilities on top of the current Web to make knowledge better for representation, accessible, and usable for its user communities [1]. A few Semantic based search engine also exists[9,10] It is technically envisioned as a network of so-called ontologies (shared, formal models of a domain that connects to a relatively coherent community of practice [2]) that add machine-process able semantics to information resource content, electronic web services and software agents populating the current Web.

DEVELOPMENT ISSUES

While analysis of pros and cons associated with the implementation of Semantic Web in Social computing main area to work on are Usability, Performance and Scalability issues for Semantic Web technologies. Some more challenges identified so far in this direction are classified as: availability of content, ontology availability, scalability, multilingualism, visualization to reduce information overload, and stability of Semantic Web languages [4]. Major development issues associated with implementation of Semantic Web in Social Computing are categories as:

Knowledge Acquisition bottleneck as it includes creating expressive machine- readable descriptions of web reality contents, which in turn is also expensive. Also relation between the real world phenomena and their formal descriptions is very difficult to be reliably captured with current approaches. The data acquisition problem is closely related to imprecision without a well-founded, non-arbitrary link between the reality and its symbolic descriptions, it is difficult to achieve and/or validate the precision and actuality of the Semantic Web knowledge bases, which hampers their reliability and applicability [7].

Defining Ontologies is basic task in development of Semantic Web and it is to represent knowledge in a machine understandable form. Ontologies are regarded as an abstraction of a conceptualization containing explicitly defined concepts and associated relations (Gruber, 1992). Ontologies are also supposed to be used for the defining the content on web and also for inter-relation between them. Data integration are available for a lot of domains, however, one often has to perform a non-trivial ontology alignment before proceeding with the data integration itself [6]. Using several Ontology development tools lets defining of ontology is carried out, then next challenge would be mapping of web services specification to Process Ontologies, which in turn also contain some limitations [8].

Semantic Web Repository is one of the main challenges in adding semantics to social web system. Present web system comprises of huge distributed environment which in turn to change or modify according to Ontologies vocabulary requires lots of efforts and expense. Also diversity in these distributed data repository adds some more milestones to cross for making Semantic web dream to come true.

SOLUTIONS TO ABOVE ISSUES

There is some of the implementation of Semantic Web in Social Computing which in near future will change the scenario of computing in social network. Here are some solutions in this regards to solve above mentioned issues.

- Rein provides ontologies for describing policy and delegation networks, and provides mechanisms for reasoning over them, both of which can be used to develop domain and policy language specific access control frameworks for Web resources. Rein is an open web-based policy and delegation framework, which supports heterogeneous domains that use different policy languages and domain knowledge. Rein provides ontologies for describing policy networks, delegations, keys, and signatures and provides mechanisms for reasoning over them, both of which can be used to develop domain and policy language specific frameworks for providing access control to Web resources [9].

- Cross Language Information Retrieval CLIR seek to support the process of finding documents written in one natural language with automated systems that can accept queries expressed in other languages [10]. CLIR is the key factor in adding semantic to web coz it solves the problem of diversity in the communication languages as it is huge problem to solve for social computing and universal usability. For example a searchers wants to search some content and fire the query in its own language, and in web system there are limited content in that language but the exact content desired is in some other language, so in order to solve this multilingual issues CLIR might preferred.
- DBpedia is a community effort to extract structured information from Wikipedia and to make this information available on the Web. As discussed above development of knowledge bases is of huge importance in enhancing the intelligence of Web, optimizing searching and in supporting information integration. The DBpedia knowledge base currently describes more than 3.64 million things, out of which 1.83 million are classified in a consistent Ontology, including 416,000 persons, 526,000 places, 106,000 music albums, 60,000 films, 17,500 video games, 169,000 organizations, 183,000 species and 5,400 diseases. The dataset consists of 1 billion pieces of information (RDF triples) out of which 385 million were extracted from the English edition of Wikipedia and roughly 665 million were extracted from other language editions and links to external datasets [12]. Having these interlinked and analytical supporting systems DBpedia also allows its users to ask sophisticated queries against Wikipedia, and to link other data sets on the Web to Wikipedia data. The DBpedia knowledge base is served as Linked Data on the Web. As DBpedia defines Linked Data URIs for millions of concepts, various data providers have started to set RDF links from their data sets to DBpedia, making DBpedia one of the central interlinking-hubs of the emerging Web of Data. We hope that these types of approaches in building huge databases and interconnecting them would make it easier for the amazing amount of information in Web to be used in new and interesting ways, and that it might inspire new mechanisms for navigating, linking thus advancing and improving the Social Computing.
- Semantic Search Engines till date have some limited powers in the search world. These are defined to search and retrieve information from web by analyzing the meaning of query fired by end user. Some of these meant for Social Web searches are Swoogle, Sense Bot, Wolfram Alpha. In order to implement these search engines for whole web system is long way to go. These engines not only search for keywords in the data repository but also analyze data and come out with relevant information about the query fired.

CONCLUSION

The semantic web describes a structure that allows machines to not only process data but also extract meaning (semantics) from it. The idea of course being that if software has access to this knowledge and meaning it could serve its user better. It sounds like a lot of power is unleashed if it becomes possible for machines to "understand" what data means. Still there are miles to go for implementation of intelligence to web for computing data from one casual user to other and adding wisdom to present social computing scenario. All the above development shows a new perspective to present web system which is vision of the future Web, where information is given well-defined meaning (semantics) in a way that allows our computers to combine and reason with information from multiple sources just as we do ourselves when we search and browse the Web. Might be possible in near future there will be cases and situations where this might come in handy for a user.

REFERENCES

- [1] John Davies, Dieter Fensel, and Frank van Harmelen, editors. *Towards the Semantic Web: Ontology-Driven Knowledge Management*. John Wiley & Sons, Chichester, UK, 2003.
- [2] Tom R. Gruber. *Towards Principles for the Design of Ontologies Used for Knowledge Sharing*. In N. Guarino and R. Poli, editors, *Formal Ontology in Conceptual Analysis and Knowledge Representation*, Dordrecht, The Netherlands, 1993. Kluwer Academic Publishers.
- [3] Kirsti Ala-Mutka, David Broster, Romina Cachia, Clara Centeno, Claudio Feijóo, Alexandra Haché, Stefano Kluzer, Sven Lindmark, Wainer Lusoli, Gianluca Misuraca, Corina Pasca, Yves Punie and José A. Valverde. *The Impact of Social Computing on the EU Information Society and Economy: A report by JRC European Commission*.
- [4] V. Richard Benjamins, Jesus Contreras, Oscar Corcho, Asuncion Gomez-Perez. *Six Challenges for Semantic Web*. Intelligent Software Components, S.A.
- [5] Bechhofer, S., et al.: Tackling the ontology acquisition bottleneck: An experiment in ontology re-engineering (2003) At <http://tinyurl.com/96w7ms>, Apr'08.
- [6] Euzenat, J., Shvaiko, P.: *Ontology matching*. Springer (2007)
- [7] V__1 Nov_a_cek, Siegfried Handschuh, Stefan Decker. *Why the Semantic Web Has Never Got Too Much of a Meaning and How to Put It There?*
- [8] Jun Shen, Yun Yang, Bharat Lalwani. *Mapping Web Services Specifications to process Ontology: Opportunities and Limitations*.
- [9] Lalana Kagal, Tim Berners-Lee, Dan Connolly, and Daniel Weitzner. *Self-describing Delegation Networks for the Web*
- [10] Douglas W. Oard, Anne R. Diekema, "Cross-Language Information Retrieval," *Annual Review of Information Science and Technology (ARIST)*, Volume 33, 1998.
- [11] Xiaorong Cheng, Haojun Guo, Yuhui Wang, Wei He. *Research on Web Cross Language Information Retrieval Based on Domain Ontology* ISECS International Colloquium on Computing, Communication, Control, and Management (2008)
- [12] DBpedia <www.wiki.dbpedia.org>.

Simulation based Analysis of AOMDV using NS2 and Throughput Comparison with DSR

Alpna Bansal, Shikha Garg and Pooja Narula

Lecturer in HEC, Jagadhri

Abstract—An ad hoc network is a collection of wireless mobile hosts forming a temporary network without the aid of any established infrastructure or centralized administration. In transferring large amount of data problem arises due to the limited bandwidth, congestion and also occur excessive delay. In this paper, we present a multipath protocol for routing in ad hoc networks, that uses on-demand distance vector routing, called Ad hoc On-demand Multipath Distance Vector (AOMDV) Routing Protocol. It eliminates the need for further routing when there is a broken link in the path. Hence reduces delay and provide required end-to-end bandwidth. We also analyze its performance using NS2. Results shows that AOMDV has better efficiency in case of throughput of number of packets received or number of packets send as compared to DSR.

Keywords: On demand routing, loop freedom and disjoint path, multipath routing, AOMDV, Throughput.

INTRODUCTION

Wireless networking is a technology that enables two or more computers to communicate using standard network protocols, but without network cabling [18]. Now, there exist a large number of network protocols that are developed just for the purpose of Wireless networks. Wireless communication technology have been developed with two primary models one is fix infrastructure based model in which much of the nodes are mobile and connected through fixed backbone nodes using wireless medium. Another model is Mobile Ad-hoc network. Mobile Ad-Hoc Networks (MANETs) are comprised of mobile nodes (MNs) that are self-organizing and cooperative to ensure efficient and accurate packet routing between nodes (and, potentially, base stations).

NEED OF MULTIPATH ROUTING

- **Balancing Energy Consumption:** To balance the energy consumption, we make the source node function as the packet balancing agent which collects energy information of paths and decides sending packets via the path with the best energy condition, namely, the path with the maximal energy metric.
- **Reduce Congestion:** Multipath protocols may cause fewer interruptions to the application data traffic when routes fail. They also have the potential to lower the routing overhead.
- **Reduce End-to-End Delay:** When transfer data over all discovered paths concurrently, it reduces end to end delay and increases end to end bandwidth.
- **Increases Data Packet Throughput:** Multipath routing can increase end-to-end throughput and provide load balancing in wired networks.
- **Reduce Route discovery Frequency:** Multi-path on-demand routing algorithms discover several paths instead of one, once the routing is performed [15]. This eliminates the need for further routing when there is a broken link in the path, reducing the average number of Route Discovery for each node and achieving higher fault tolerance for the Mobile Ad-hoc networks.

LITERATURE SURVEY

Alvin Valera et al [17] introduced data packet caching in the context of mobile ad hoc networks. They proposed a new routing protocol called Caching and Multipath (CHAMP) Routing protocol. CHAMP uses cooperative packet caching and shortest multipath routing to reduce packet loss due to frequent route breakages. Performance improvements in terms of higher packet delivery, lower delays and reduced routing overhead are obtained due to the temporal locality of dropped packets.

Asis Nasipuri et al [14] extend DSR to compute multiple link disjoint paths for overhead reduction in mobile networks. Besides, they also use analytical modeling to study the effect of number of multiple paths and path lengths on on-demand routing performance. Tom Goff et al [15] extended DSR and AODV for preemptive maintenance. Modified DSR and AODV algorithms are called Preemptive Dynamic Source Routing (PDSR) and Preemptive Ad hoc On-demand Distance Vector (PAODV) respectively.

Loop Freedom

Two issues arise when computing multiple loop-free paths at a node for a destination. First, which one of the multiple paths should a node offer or advertise to others? Second, which of the advertised paths should a node accept? Again, accepting all paths naively may cause loops.

Based on the above, we formulate below a set of sufficient conditions for loop-freedom.

Sequence number rule

Maintain routes only for the highest known destination sequence number. For each destination, we restrict that multiple paths maintained by a node have the same destination sequence number. Once a route advertisement containing a higher destination sequence number is received, all routes corresponding to the older sequence number are discarded.

For the same destination sequence number

- Route advertisement rule: Never advertise a route shorter than one already advertised.
- Route acceptance rule: Never accept a route longer than one already advertised.

To maintain multiple paths for the same sequence number, AOMDV uses the notion of an 'advertised hop count.' Every node maintains a variable called advertised hop count for each destination. This variable is set to the length of the longest available path for the destination at the time of first advertisement for a particular destination sequence number. The advertised hop count remains unchanged until the sequence number changes. Advertising the longest path length permits more number of alternate paths to be maintained.

Disjoint Paths

Two observations for link disjoint paths are:

If two paths from a node P to a destination D are link disjoint, then they must have unique next hops as well as unique last hops. Note that the converse of this observation is not necessarily true. However, the converse also holds true in general with an additional restriction:

If every node on a path ensures that all paths to the destination from that node differ in their next and last hops. This implication provides us with a tool to determine whether two paths via two unique downstream neighbors are link disjoint. They simply need to have unique last hops

Detailed Protocol Description

We describe the protocol in four components: routing table structure, route discovery, route maintenance, and data packet forwarding. Here we describe the link disjoint version of the protocol in detail, so all references to disjointness actually imply link disjointness. A straightforward modification to this protocol yields node disjoint paths instead.

Routing table

Figure 1 shows the routing table entry for AOMDV. AOMDV route table entry has a new field for the advertised hop count. Besides a route list is used in AOMDV to store additional information for each alternate path including: next hop, last hop, hop count, and expiration timeout. As already discussed, last hop information is useful in checking the disjointness of alternate paths.

Table 1

Destination	Sequence Number	Advertised Hop Count	Route List
next_hop ₁	last_hop ₁	hop_count ₁	timeout ₁
next_hop ₂	last_hop ₂	hop_count ₂	timeout ₂

Fig. 1: Routing table entry structure in AOMDV

Consider a destination d and a node i . Whenever the destination sequence number for d at i is updated, the corresponding advertised hop count is initialized. For a given destination sequence number, let hop_count_{ik}^d denote the hop count of k th path (for some k) in the routing table entry for d at i , that is $(\text{next_hop}_{ik}^d, \text{last_hop}_{ik}^d, \text{hop_count}_{ik}^d) \in \text{route_list}_i^d$. When i is about to send its first route advertisement for d , it updates the advertised hop count as follows:

$$\text{advertised_hop_count}_i^d := \max_k \{\text{hop_count}_{ik}^d\}, i \neq d$$

$:= 0$, otherwise

Whenever a node receives a route advertisement, it invokes the AOMDV route update rules listed in Figure 2. Note that lines (1) and (10) in Figure 2 ensure loop freedom, whereas lines (12) and (15) check for link disjointness.

- 1: if $(\text{seq_num}_i^d < \text{seq_num}_j^d)$ then { /* enforces the sequence number rule */ }
- 2: $\text{seq_num}_i^d := \text{seq_num}_j^d$;
- 3: $\text{advertised_hop_count}_i^d := \infty$;
- 4: $\text{route_list}_i^d := \text{NULL}$;

```

5: if (j=d) then { /* neighbor is the destination */
6:   insert(j,i,1) into route_list_i^d;
7:   else
8:   insert(j,last_hop_j^d, advertised_hop_count_j^d+1) into route_list_i^d;
9:   end if
10: else if ((seq_num_i^d = seq_num_j^d) and (advertised_hop_count_i^d > advertised_hop_count_j^d))
    then { /* enforces the route acceptance rule */
11:   if (j=d) then { /* neighbor is the destination */
12:   if ((∃k_1 : (next_hop_{ik_1}^d = j)) and (∃k_2 : (last_hop_{ik_2}^d = i)))
    then { /* establishes uniqueness of next and last hops */
13:   insert(j,i,1) into route_list_i^d;
14:   end if
15:   else if ((∃k_3 : (next_hop_{ik_3}^d = j)) and (∃k_4 : (last_hop_{ik_4}^d = last_hop_j^d)))
    then { /* establishes uniqueness of next and last hops */
16:   insert(j,last_hop_j^d, advertised_hop_count_j^d+1) into route_list_i^d;
17:   end if
18:   end if

```

Figure 1: AOMDV Route Update Rules

Route Discovery

When a traffic source needs a route to a destination, the source initiates a route discovery process by generating a RREQ as shown in figure 3(a). Since the RREQ is flooded network-wide, a node may receive several copies of the same RREQ. All duplicate copies are examined in AOMDV for potential alternate reverse paths as shown in figure 3(b) and 3(c), but reverse paths are formed only using those copies that preserve loop-freedom and disjointness among the resulting set of paths to the source as shown in figure 3(d).

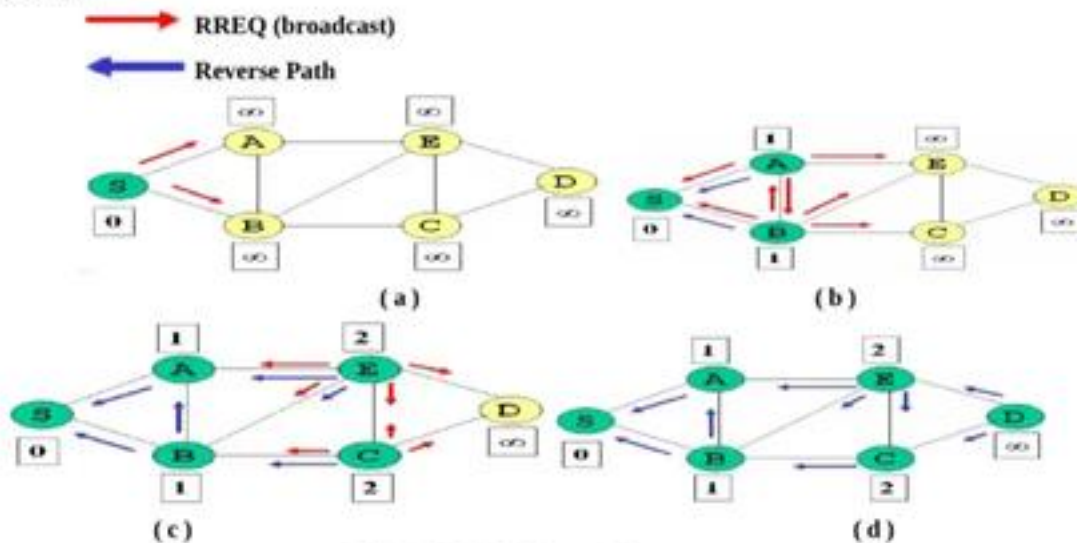


Fig. 3: AOMDV Route Discovery

Route maintenance

A node generates or forwards a RERR for a destination when the last path to the destination breaks. AOMDV also includes an optimization to salvage packets forwarded over failed links by re-forwarding them over alternate paths. This is similar to the packet salvaging mechanism in DSR [3].

DATA PACKET FORWARDING

For data packet forwarding at a node having multiple paths to a destination, we adopt a simple approach of using a path until it fails and then switch to an alternate path; we use paths in the order of their creation. There are other alternatives for data packet forwarding which concurrently use all paths. With 'diversity coding' [16], an overhead is added to each data packet (coding) and the resulting coded packet is split into smaller blocks each of which is transmitted along a different path.

SIMULATION BASED ANALYSIS OF AOMDV ROUTING PROTOCOL

We implement AOMDV routing protocol using network simulator ns-2.34. After executing.tcl files.tr (trace files) are generated. To filter the data from trace files, we have used simple grep command and awk filter both. grep is a command to search a particular pattern from a file or a string. grep is search Globally for lines matching Regular Expression and Print them. awk is a good filter and a report writer. It is a pattern searching and processing language. The name was composed from the initial letters of three original authors Alfred V. Aho, Brian W. Kernighan, and Peter J. Weinberger.

Simulation environment of network simulator ns-2.34 is described below by table 2.

Table 2: Simulation Parameters

Parameter	Value
Simulation Time	900 seconds
Network Size	1000*1000(m ²)
Number of Nodes	16
Transmission Range	250 m
Traffic type	Constant Bit Rate
Traffic rate	5.4 Mb/s

Parameters Measured

Throughput is a measure of the amount of data that can be sent over a link in a given amount of time as shown in figure 4. The throughput is determined by the formula:

$$\text{Throughput} = \frac{\text{Data Transferred}}{\text{Simulation Time}}$$

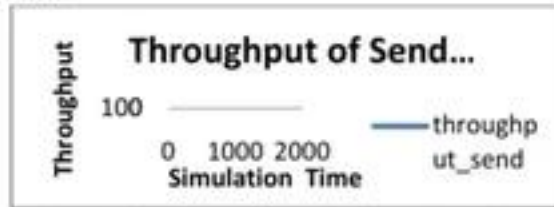


Fig. 4: Throughput of Send and Receive Packets

Packet delivery ratio is the ratio of the number of data packets actually delivered to the number of data packets are supposed to be received. We calculate the packet delivery ratio for AOMDV with the scenario of different number of nodes. Graph is shown in figure 5.

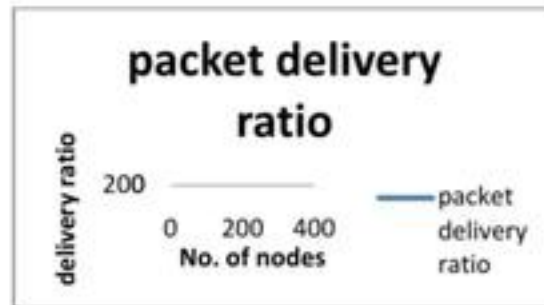


Fig. 5: Packet Delivery Ratio (no. of Nodes Variabilty)

After Simulation, some of the parameters calculated through awk filter are shown in table 3.

Table 3: Simulation Result

Parameter	Value
Total number of packets sent	47467
Total number of packets received	46180

Table 4: Throughput Comparison of DSR and AOMDV

Parameter	DSR	AOMDV
Average throughput of number of sent packets	44.79	49.44
Average throughput of number of received packets	44.78	48.10

CONCLUSION AND FUTURE SCOPE

In this paper, we have simulated an on-demand multipath protocol called AOMDV. It ensures loop-free and disjoint multiple paths. We have studied the performance of AOMDV using ns2 simulations under number of nodes variability. Several additional issues related to the design and evaluation of AOMDV protocol may require further investigation. Protocol can be improved to effectively deal with the route cutoff problem and compute more disjoint paths when source-destination pairs are far apart.

REFERENCES

- [1] Ahmed S, Alam M.S(2006), " Performance evaluation of important ad-hoc network protocols", Proceedings of EURASIP Journal on Wireless Communication and Networking vol. 6(2), pp. 42
- [2] Charles E. Perkins and Elizabeth M. Royer (1998), "Ad hoc on demand distance vector (AODV) routing (Internet-Draft)".
- [3] C. Siva Ram Murthy and B.S. Manoj(2004), "Ad hoc Wireless Networks Architecture and protocols", Prentice Hall.
- [4] Francisco J. Ros, Pedro M. Ruiz(2004), "Implementing a new MANET unicast routing protocol in NS2".
- [5] Garcia-Luna-Aceves JJ, Mosko M, Perkins CE(2003), "A new approach to on-demand loop-free routing in ad hoc networks", in Proceedings of ACM PODC
- [6] Goff T, Abu-Ghazaleh N, Phatak D, Kahvecioglu R(2001). "Preemptive routing in ad hoc networks", in Proceedings of IEEE/ACM MobiCom.
- [7] Humaira Ehsan and Zartash Afzal Uzmi(2004), "Performance Comparison of ad hoc wireless network routing protocol", Proceedings of INMIC 8th International, pp. 457–465.
- [8] Johnson DB, Maltz DA, Hu Y(2004), "The dynamic source routing protocol for mobile ad hoc networks (DSR)", <<http://www.ietf.org/internet-drafts/draft-ietf-manet-dsr-10.txt>>.
- [9] Kapang Lego, Pranav K. Singh, Dipankar Sutradhar, "Comparative Study of Ad hoc routing protocols AODV, DSR, DSDV in mobile ad hoc network", International Journal of CSE vol. 1(4), pp.364–371
- [10] Klaus Nieminen, "Introduction to Ad-hoc Networking." <<http://www.citeseerx.edu/>>.
- [11] Lee S J, Gerla M(2000). "AODV-BR: backup routing in ad hoc networks", in Proceedings of IEEE Wireless Communications and Networking Conference (WCNC)
- [12] Marina M.K, Das S.R(2006), "Ad hoc on-demand multipath distance vector routing", in Proceeding IEEE Wireless Communication and mobile computing, vol. 6, pp. 969–988.
- [13] Marina MK, Das SR(2002). "Routing performance in the presence of unidirectional links in multihop wireless networks", ACM MobiHoc,
- [14] Nasipuri A, Castaneda R, Das SR(2001),"Performance of multipath routing for on-demand protocols in mobile ad hoc networks", ACM/Kluwer Mobile Networks and Applications (MONET), vol. 6(4),pp. 339–349
- [15] S. Mueller, R. Tsang, D. Ghosal(2004), "Multipath Routing in Mobile Ad Hoc Networks: Issues and Challenges", Lecture Notes in Computer Science (LNCS 2965), pp. 209–234.
- [16] The VINT Project(2011),"The ns Manual (formerly ns notes and documentation)", <<http://www.isi.edu/nsnam/ns/ns-documentation.html>>.
- [17] Valera A, Seah WKG, Rao SV(2003). "Cooperative packet caching and shortest multipath routing in mobile ad hoc networks", in Proceedings of IEEE Infocom
- [18] Vicomsoft (2003), "Knowledge share whitepapers wireless networking Q&A", Vicomsoft connect and protect
- [19] Tsirigos A, Haas Z.J. (2001), "Multipath routing in the presence of frequent topological changes", IEEE Communications Magazine, vol. 39(11), pp. 132–138.

Boom of Artificial Intelligence

Indu Tripathi

Lecturer, CMCA, TMU

Abstract—Artificial intelligence (AI) is a great burst through of modern technology. There are several societies and journals concerned with AI. The branch of computer science concerned with making computers behave like humans. It studies how to design software that can perform tasks that require intelligence. There are some examples of AI Tasks: playing chess, understanding natural language, proving mathematical theorems, medical diagnosis, robotic navigation etc. It is surprising what intellectual tasks are easy/ difficult for a computer to perform. A machine that passes a turning test should certainly be considered intelligent. AI has sharpened understanding of human reasoning and of the nature of intelligence in general. Currently, no computer is able to simulate human behaviour totally. So we should not expect computer intelligence to be the same as human intelligence anymore than we expect airplanes to fly the same as a bird.

Keywords: AI, robotic navigation, Turing test, natural language

It was conventionally reckoned that only mankind and advanced species possess intelligence. However, the development of computers, robots, software agents, and autonomous systems indicates that intelligence may also be created or embodied by machines and man-made systems. Therefore, it is one of the key objectives in cognitive informatics and intelligence science to search a coherent theory for explaining the nature and mechanisms of both natural and artificial intelligence.

"The characteristics of a machine programmed to imitate human intelligence functions." a definition of AI given in Webster's dictionary. AI is the subfield of computer science that studies how to design software that can perform tasks that require intelligence AI studies how to get computers to perform intellectual tasks that it is not obvious computers can perform. (For example: writing music). There are numerous definitions of what artificial intelligence is. We end up with four possible goals:

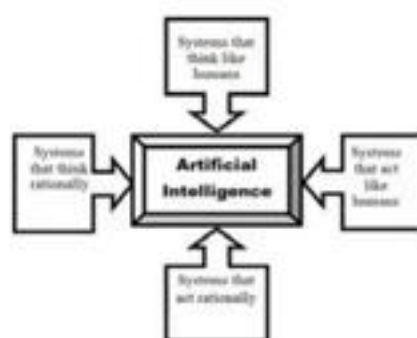


Fig. 1

Systems that think like humans

These systems focus on reasoning and human framework.

Systems that think rationally

These systems focus on reasoning and a general concept of intelligence

Systems that act like humans

These systems focus on behavior and human framework.

Systems that act rationally

These focus on behavior and a general concept of intelligence. What is rationality? – In simple speaking, it means “doing the right thing”.

There are some examples of AI Tasks: playing chess, understanding natural language, proving mathematical theorems, vision (for example, recognizing military installations in satellite images), discovering useful knowledge from huge amounts of raw data (for example, classifying galaxies in astronomical images, or recognizing patterns in genetic data), medical diagnosis, robotic navigation and control and intelligent tutoring.

The greatest advances have occurred in the field of games playing. The best computer chess programs are now capable of beating humans. You can buy machines that can play master level chess for a few hundred dollars. There is some AI in them, but they play well against people mainly through brute force computation--looking at hundreds of thousands of positions. To beat a world champion by brute force and known reliable heuristics requires being able to look at 200 million positions per second. In May, 1997, an IBM super-computer called *Deep Blue* defeated world chess champion Gary Kasparov in a chess match.

One of the most feasible kinds of expert system given the present knowledge of AI is to put some information in one of a fixed set of categories using several sources of information. An example is advising whether to accept a proposed credit card purchase. Information is available about the owner of the credit card, his record of payment and also about the item he is buying and about the establishment from which he is buying it (e.g., about whether there have been previous credit card frauds at this establishment).

Today, the hottest area of artificial intelligence is neural networks, which are proving successful in a number of disciplines such as voice recognition and natural-language processing. There are several programming languages that are known as AI languages because they are used almost exclusively for AI applications. The two most common are LISP and Prolog. In the 1990s, computer speech recognition reached a practical level for limited purposes. Thus United Airlines has replaced its keyboard tree for flight information by a system using speech recognition of flight numbers and city names. It is really convenient. On the other hand, while it is easy & possible to instruct some computers using speech, most of the users have gone back to the keyboard and the mouse as still more convenient. Natural-language processing offers the greatest potential rewards because it would allow people to interact with computers without needing any specialized & particular knowledge. One could simply walk up to a computer and talk to it. Unfortunately, programming computers to understand natural languages has proved to be more difficult than originally matter & thought. Some elementary translation systems that translate from one human language to another are in existence, but they are not nearly as good as human translators. There are also voice recognition systems that can convert spoken sounds into written words, but they do not comprehend what they are writing; they simply take dictation. Even these systems have quite limitation: you must speak slowly and distinctly for better result.

In the area of robotics, computers are now widely used, but they are capable of very limited tasks. Robots have great difficulty identifying objects based on appearance or feel, and they still move and handle objects awkwardly.

It is surprising what intellectual tasks are easy/ difficult for a computer to perform. For example, doing complex mathematical calculations is easy for a computer; recognizing a person's face is extraordinarily difficult. Once a computer can do it, people wonder whether it's really intelligence! (The program "Deep Blue" beat the best human chess player in 1998, but is it intelligent? Computer intelligence has a brute-force quality.) AI has been most successful in domains that require specialized expertise without the assistance of commonsense knowledge. It turns out that the most difficult thing to program into a computer is common sense!

The measurement for comparative intelligence is proposed by Alan Turing based on the Turing test (Turing, 1950) known as Turing intelligent equivalence. The Turing test is a one-sided test. A machine that passes the test should certainly be considered intelligent, but a machine could still be considered intelligent without knowing enough about humans to imitate a human. A. Alan Turing's 1950 article *Computing Machinery and Intelligence* [Tur50] discussed conditions for considering a machine to be intelligent. He argued that if the machine could successfully pretend to be human to a knowledgeable observer then you certainly should consider it intelligent. This test would satisfy most people but not all philosophers. The observer could interact with the machine and a human by teletype (to avoid requiring that the machine imitate the appearance or voice of the person), and the human would try to persuade the observer that it was human and the machine would try to fool the observer.

An award of \$100,000 and a Gold Medal was given to the first computer whose responses are indistinguishable from a human's, as judged by the Turing test. Each year a Loebner prize of \$2000 and a bronze medal is awarded to the most human computer entered in the competition. Many programs entered in Loebner competition use strategies similar to those used by Eliza, a program written by Weizenbaum (1966), a critic of AI.

In its short existence, AI has increased understanding of the nature of intelligence and provided an impressive array of applications in a wide range of areas. It has sharpened understanding of human reasoning and of the nature of intelligence in general. At the same time, it has revealed the complexity of modeling human reasoning, providing new areas and rich challenges for the future. We should not expect computer intelligence to be the same as human intelligence anymore than we expect airplanes to fly the same as a bird.

REFERENCES

- [1] B. Goertzel and C. Pennachin, editors (2007) *Artificial General Intelligence*. Springer.
- [2] Hewitt, C. (1977), *Artificial Intelligence, Viewing Control Structures as Patterns of Passing Messages*, 8(3), pp323–364.
- [3] McCarthy, J., Minsky M.L., Rochester N., and Shannon C.E. (1955), "Proposal for the 1956 Dartmouth Summer Research Project on Artificial Intelligence", Dartmouth College, Hanover, NH, USA, <<http://www-formal.stanford.edu/jmc/history/dartmouth/dartmouth.html>>
- [4] Jeasen, A.R. (1987), *Psychometric gas a Focus on Concerted Research Effort*, *Intelligence*, (11), pp93–198.
- [5] Jennings, N.R. (2000), *Artificial Intelligence, On Agent-Based Software Engineering*, 17(2), pp277–296.
- [6] S.J. Russell and P. Norvig (2003) *Artificial Intelligence. A Modern Approach*. Prentice-Hall, Englewood Cliffs, NJ, 2nd edition.
- [7] <<http://www.indianceleb.com/infopedia/computing/free-artificial-intelligence-article-ebook>>
- [8] <<http://www-formal.stanford.edu/jmc/whatisai/node1.html>>
- [9] <http://www.webopedia.com/TERM/A/artificial_intelligence.html>
- [10] <http://en.wikibooks.org/wiki/Artificial_Intelligence/Definition>
- [11] <<http://www.cse.msstate.edu/~hansen/classes/AI/spring04/slides/firstclass.pdf>>
- [12] <<http://enel.ucalgary.ca/People/wangyx/Publications/Papers/ai/IJSSCI-1101-AbstractInt.pdf>>

Data Mining: Process, Techniques and Scope in Competitive Intelligence

Palak Gupta

Assistant Professor, Jagannath International Management School

Abstract— Data mining is a latest technique which allows analyzing enormous data sets from an enterprise's database to yield hidden and unknown predictions that can be used in future for efficient decision making. It involves pattern recognition, statistical and mathematical techniques to search data warehouses and help the analysts in recognizing significant trends, facts, relationships, exceptions and anomalies that might otherwise go unnoticed. This paper includes the study of data mining of uncertain and voluminous data in business intelligence. The data that is used in current business domains is not precise, accurate and complete. Instead, data is considered uncertain and therefore this uncertainty is propagated to the results produced by Business Intelligence. Through this paper we wish to uncover such areas and define data mining process, models, techniques and then discuss the potential applications, future and scope of mining in huge enterprise databases that provides quick, predictive and summarized information to the decision makers and enables companies to have sound competitive intelligence and in turn be the leader in the market.

Keywords: Data mining, Business Intelligence, data warehouses, pattern recognition and statistics.

INTRODUCTION

In today's business environment, where companies face global competition, survival and defeat depends on the efficiency, timeliness, knowledge and better decision making ability. Business Intelligence is used extensively for collecting, storing and analyzing business data that helps the enterprise to make better decisions and gain competitive intelligence [B. de Ville, 2001]. So, information technology is now required in every aspect of our lives which helps business and enterprise to make use of applications like decision support system, query and reporting, complex event processing, online analytical processing, statistical and predictive analysis and business performance management. These techniques of business intelligence, no doubt improve the performance and competitive intelligence of an enterprise by analyzing both its internal data along with the competitor's information [Bergeron and Hiller, 2002] but to analyze volumes of data stored in data warehouse and data marts is still a time consuming and complex task. Thus, to provide better analysis of data, data mining methodology is used which is a computer assisted process of exploring and analyzing volumes of data and then extracting their correct meaning to enable business managers take best profitable decisions.

It is primarily used by companies with a strong consumer focus like financial, marketing, retail and communication organizations and so enables them to find relationships among "internal factors" like price, staff skills, and product line and "external factors" like competition, customer choice, economic indicators and market segmentation. It also helps enterprises to determine the impact on corporate profits, sales, goals and objective fulfilment and ultimately the customer satisfaction. Finally, it enables them to "drill-down" into the summary information to new detail transactional data.

PROCESS OF DATA MINING

Data mining is a pure application dependent stage that provides extraction of useful, valid, understandable patterns from database, texts and web. It provides ways to make best use of data through rapid computerization [Pyle, 2003]. Data mining software analyzes relationships and patterns in stored transaction's data based on open-ended user queries. It uses modelling techniques to make a model that is a set of examples or a mathematical relationship based on data from situations where the answer is known and then applying the same model to other situations where answers are hidden [The process of data mining involves following three stages-

Exploration

This stage involves data preparation, data cleaning, data transformations, selecting subsets of records and then performing feature selection to reduce number of variables to a manageable range. This reduction and choice of variables depends on the complexity of analysis varying from simple predictions for regression model to exploratory analyses of graphical and statistical data.

Model Building and Validation

This stage involves choosing the best model based on their predictive performance by competitive evaluations in which different models are applied to same data set and the best is chosen after comparing their performances. The techniques used for comparison of models are bagging (voting for classification and averaging for regression-type problems with continuous dependent variables of interest), boosting (generate classifiers for predictive analysis and derive weights to combine their predictions into one), stacking (stacked generalizations) and meta learning (combines predictions from multiple varying projects).

Deployment

This is the final stage in which the model selected as best in the previous stage is applied to new data so as to generate predictions and estimates of the expected outcome. For example, an online shopping site doing e-commerce transactions through credit card may deploy neural networks and meta learner to identify fraudulent transactions.

Data mining process involves following tasks to sought relationships-

- Classification
- Sequential Pattern Matching-
- Association-

It is a rule $X \rightarrow Y$ such that X and Y are data item sets.

- Clustering-
- Deviation Detection
- Regression

DATA MINING MODELS

Data mining uses a number of models to find mathematical relationships based on data from situations where the answer is known and then using the same model to other situations where answers are hidden. Following are the data mining models-[Hill and Lewicki, 2007]

CRISP (Cross-Industry Standard Process for Data Mining)

It tells the process how to integrate data mining methodology into an organization, how to involve stakeholders, how to convert data into information and how to distribute information to enable decision making by stakeholders. It is basically used in European companies.

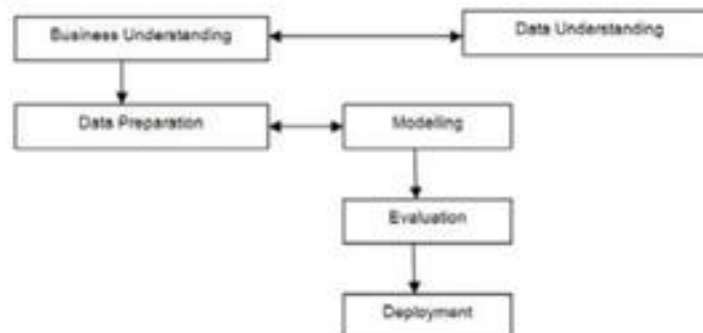


Fig. 1: CRISP Model for Data Mining

Six Sigma

It is a well-structured, data driven model that removes waste, defective and quality control problems in activities related to management, manufacturing and service delivery. It is quite popular in American industries.

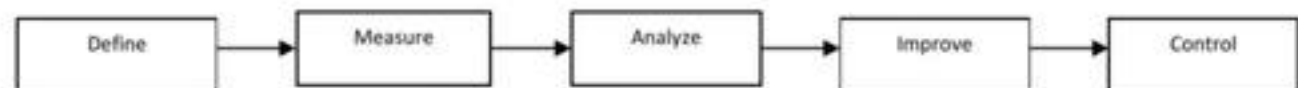


Fig. 2: Six Sigma Model for Data Mining

Semma

This model focuses more on the technical activities involved in a data mining project.

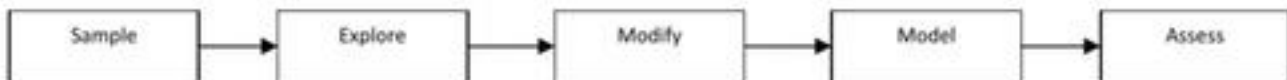


Fig. 3: SEMMA Model for Data Mining

DATA MINING TECHNIQUES

Data mining is less concerned to find relations between the involved variables and is more focussed on applications producing a solution that can generate useful predictions. It uses "black-box" approach to explore data and discover knowledge using traditional Exploratory Data Analysis (EDA) techniques and latest neural network technologies that can generate valid estimates. Data mining techniques are a blend of statistics, artificial intelligence and database research [Berson, Smith and Thearling, 1999]. There are two categories of data mining techniques.

Hon'ble Group Vice Chairman's Message

I am happy to know that College of Management and Computer Applications of Teerthanker Mahaveer University is organizing the second International conference on "***Resurging India—Myths and Realities***" on March 17-18, 2012. In the quest for knowledge and developing quality teaching and research base in the college, the scheduled conference is surely a step in the right direction. The discussion by the experts from the industry and academia in the conference shall throw light on the claim in certain sections that soon India will be an economic power to reckon with globally and also take a realistic position on the issue.

I congratulate the delegates coming from distant places to attend this conference and being a part of this great academic congregation. I convey my best wishes for the success of this conference.

Manish Jain

*Group Vice Chairman,
Teerthanker Mahaveer University, Moradabad*

- Classical Techniques-statistics, neighbourhood and clustering
- Latest/ Next Generation techniques-artificial neural networks, decision trees, induction rules and genetic algorithms
- Statistics

There are several statistical methods like correlation, clard analysis, hypothesis testing and discriminant analysis used in data mining projects that are widely used in science and industry to enable description and visualization of large chunks of data. But statistical methods are valid if and only if some assumptions about the data are met such as normal probability distributions, linear relationships between pairs of variables, independence of samples and non-multicollinearity. If these assumptions due to time limitations or non-familiarity are not met then the analysis may be wrong and so the predictions stated may not be correct or of good quality which would ultimately lead to poor decision making.

NEAREST NEIGHBOUR

It is a data mining technique that classifies each record in a dataset based on the combination of the classes of the record(s) quite similar to it in the historical database. It is also called as k-nearest neighbour technique which is easy to use and understand as it works in a way similar to the way that people think by predicting close matches. It performs quite well in terms of automation as its algorithms are robust to missing and wrong data. It is mostly used to perform complex Return On Investment (ROI) calculations. It uses sense of ordering to predict that objects that are "near" to each other will have similar prediction values. Thus if prediction value of one of the objects is known, the prediction values of its nearest neighbours can easily be predicted.

It is commonly applied for text retrieval from documents but in problems of time series like stock market predictions, it is accomplished by taking the majority of predictions from k-nearest neighbours if the prediction column is binary or taking the average value of the prediction column from k-nearest neighbours [Michael and Gordon, 2004]. This data mining technique not only makes predictions but also gives confidence information in a number of ways-

1. Distance to the nearest neighbour-if the neighbour is very close or is an exact match, then the confidence in the prediction is higher than if the distance is more.
2. Degree of homogeneity-if k-nearest neighbours make some prediction, then the confidence in the prediction is higher than if predictions are different from halves of the total records.

CLUSTERING

It is an automatic data mining technique that divides volumes of documents into groups that are related to each other on the basis of common properties such as date, cost etc. These groups or clusters are then used to find hidden similarities, provide brief on large database collection and simplify searching process to find related or linking information. Usually, this is done to give the end-user a high level view of the database. It is also used to find the odd-one cluster. It is of two types-

1. Hierarchical Clustering-It creates a cluster hierarchy in form of a tree reaching to an extreme of as many clusters as there are records using algorithms like agglomerative or divisive. However, it is not suitable sometimes as with such diverse clusters, pattern prediction becomes difficult. Here, the clusters are defined on basis of data and can be scaled up and down by moving in the hierarchy. At the top there is one cluster with all records and at the bottom there as many clusters as many as number of records.
2. Non-Hierarchical Clustering-It uses technique of either single-pass method in which database records are read only once to form clusters or reallocation methods in which records are shuffled among clusters to give faster results.

ARTIFICIAL NEURAL NETWORKS

This data mining technique uses non-linear predictive models to enable learning through training across a large number of diverse problems. Here, the computer is trained to think, respond and take decisions similar to humans. However, a lot of training has to be given to the system and only processed data is fed which gradually by learning and expertise makes the system efficient to mine and predict patterns from a database. Neural network models are quite complex to use and deploy even by experts due to which it is packaged ad a complete solution which once proved successful could be used endless without requiring deep understanding. It is also packaged with expert consulting services to enable business organizations detect fraudulent use of credit cards. It determines relevant predictors for a model which are either used by themselves or in conjunction to yield "features" [Michael Gilman, 2004].

DECISION TREES

It is a data mining technique in which tree shaped structures represent sets of decisions generating rules for dataset classification. The top node also called as root is the starting node which is partitioned into two or more nodes depending on the results of the test. It is a fast data mining technique which allows results to be presented as rules with little or no

pre-processing of business data. Decision trees are used both for exploration and prediction using methods like Classification and Regression Trees (CART) and Chi Square Automatic Interaction Detection (CHAID). Both techniques allow dataset classification and predict which records will give predictions by using a set of rules. CART creates two-way splits from dataset segmentation and requires less data preparation than CHAID which creates multi-way splits. It however, during tree traversal, may leave valuable rules undiscovered based on limited information. Rules for decision tree are mutually exclusive and relatively exhaustive by top-to-bottom “greedy search” that is looking for the best split in next step.

RULE INDUCTION

It is one of the major data mining technique which enables knowledge discovery and unsupervised learning by extracting useful if-then rules from the database based on statistical significance. It pulls out possible patterns from database along with accuracy and significance parameters attached to each. Thus, user can now be more confident in selecting a prediction which is more sound and correct or has better logic and explanations attached by neural network. But sometimes it becomes confusing to select the best rule out of the pool of rules. Rule induction is used on databases with either fields of higher cardinality or with many columns of binary fields. The rules produced by this data mining technique are not mutually exclusive and could be collectively exhaustive. It uses bottom-to-top approach in collecting patterns suited for later predictions. They retain all possible patterns even if they are redundant.

GENETIC ALGORITHMS

It is an optimized data mining technique that is based on the concepts of genetics, combinations, natural selection and mutation [Chen, 2002]. It has the ability to do fitness functions and crossover operations through random selection thus allowing strong analysis in changes in fitness from one population segment to another. However, it may sometimes pose problem in choosing the best possibility out of others [Chuck Kelley, 2002]. Genetic algorithms promote “survival of the fittest” using heuristic functions. There are two approaches to apply genetic algorithms in pattern recognition-one directly as a classifier and another as an optimization tool for resetting the parameters in other classifiers. Genetic algorithms are used to find an optimal set of feature weights that improve classification accuracy.

TECHNOLOGICAL INFRASTRUCTURE FOR DATA MINING

Data mining applications, in today’s scenario, are quite diverse in size and storage capacities ranging from mainframes to personal computers. Enterprise-wide applications range from 10 Gigabytes to even higher. So there main two critical technological drivers for data mining-

1. Database size-the configuration of the system now needs to be more advanced as more volumes of data are now processed and maintained.
2. Query complexity-more advanced systems are required now with more complex queries and increasing numbers to be processed.

With increase in number and size of applications, relational databases are now used with extensive indexing capabilities to enhance performance of query evaluation and response. Along with this, new hardware architectures like Massively Parallel Processors (MPP) are used which can link hundreds of high speed Pentium processors to achieve performance better than the supercomputers.

DATA MINING APPLICATIONS

Data mining has gained its popularity in almost all traits as it helps to quickly analyze large databases which otherwise would be too complex and time consuming.

The following list includes some possible applications-

- Market segmentation-to identify customer’s common characteristics and behaviour that purchase same products of a company [Doug Alexander, 2000].
- Banking-to learn underwriting, mortgage approval etc.
- Web marketing-for targeted banner advertisements, personalization and cross sell/ upsell opportunities.
- Customer Churn-to predict customers who are likely to leave the company and go to a competitor.
- Direct marketing-for identifying prospects that are included in mailing list so as to obtain highest response time. It includes churn models, response models and next to buy analysis.
- Fraud detection-to identify fraudulent transactions such as in credit card usage.
- Finance-for stock and bond analysis, analysis and forecasting of business performance.
- Manufacturing-for quality control, improvement and preventive maintenance.
- Trend Analysis-to reveal the difference between a customer’s behaviour over consecutive months.
- Medicine-for diagnosis, epidemiological studies, drug analysis and quality control.
- Government-for threat assessment and searching terrorist profiles.

FUTURE AND SCOPE OF DATA MINING

Data mining technology has bright future in business domains as it helps to generate new opportunities by automated prediction of behaviours and trends in a large database. For example, targeted marketing to get better Return On Investment(ROI) can be done by data mining past promotional mailings and identifying population segments that respond similarly to given events. Data mining techniques help to automatically discover previously unknown patterns such as identifying anomalous data that could highlight errors generated during keying data entry.

Data mining is not only a hit with sales and marketing companies but also with financial institutions as it allows analysts to fast search through financial records and make best investment decisions. Even healthcare organizations are using data mining techniques to understand past trends and reduce future costs. So, future of data mining can be analyzed in three phases as following-

1. In short term-here data mining is profitable for micro-marketing campaigns which advertise for target potential customers.
2. In medium term-here data mining is as easy as to use internet and emails like finding best prices.
3. In long term-here prospects of data mining are too fruitful, enabling new decisions and new insights from the database.

Though data mining has lots of benefits in varying fields, it yet poses privacy concerns where one's data stored at one database could be accessed by others either in same physical location or across internet leading to eavesdropping, frauds and security issues.

DATA MINING PRODUCTS

Data mining is now welcomed and used aggressively in industries [Mike Chapple, 2011]. The major database vendors are already using data mining techniques in their platforms such as-

- Darwin-It is an Oracle Data Mining Suite which implements classification and regression trees, k-nearest neighbours, regression analysis, neural networks and clustering algorithms.
- SQL Server-It is Microsoft database platform which allows data mining functionality through the use of clustering algorithms and classification trees.
- SPSS, SAS and S-Plus-These are advanced statistical packages allowing the implementation of data mining algorithms.

CONCLUSION

Thus data mining is an essential component in business operations to gain competitive intelligence as it helps in quick and efficient analysis of volumes of data stored in data warehouse and data marts from different perspectives and suggests hidden and unknown predictions that ultimately enhance future decision making process. Its techniques allow statistical, analytical and multidimensional analysis of data to evaluate relationships, correlations and trends. It is a powerful new technology helping companies to focus on the most important information in the data collected so as to evaluate and understand the behaviour of potential customers and in turn capture the market.

Figures

- Figure 1 CRISP Model for Data Mining
- Figure 2 Six Sigma Model for Data Mining
- Figure 3 SEMMA Model for Data Mining
- Figure 4 Hierarchy of clusters (lower level clusters are merged to give clusters at next higher level)

REFERENCES

- [1] Alexander Doug, "Data Mining", (2000), <http://www.laits.utexas.edu/~norman/BUS.FOR/course_mat/Alex/, electronic article>.
- [2] B. de Ville, (2001), "Microsoft Data Mining: Integrated Business Intelligence for e-Commerce and Knowledge Management", Boston: Digital Press.
- [3] Berry J.A. Michael, Linoff S. Gordon, (2004), "Data Mining Techniques", Wiley Publications
- [4] Berry J.A. Michael, Linoff S. Gordon, (2004), "Mastering Data Mining", Wiley Publications
- [5] Berson Alex, Smith J. Stephen, Thearling Kurt, (1999), "Building Data Mining Applications for CRM", McGraw-Hill Companies
- [6] Chapple Mike, "Data Mining: An Introduction", (2011), <<http://databases.about.com/od/datamining/a/datamining.htm>>
- [7] Chen, S. H, (2002), "Genetic Algorithms and Genetic Programming in Computational Finance", Boston, A: Kluwer
- [8] D. Pyle, (2003), "Business Modeling and Data Mining", Morgan Kaufmann, San Francisco, CA.
- [9] Frank, E., Paynter, G., Witten, L.H., Gutwin, C. and Nevill-Manning, C, (1999), "Domain-specific keyphrase extraction." Proc Int Joint Conf on Artificial Intelligence IJCAI-99. Stockholm, Sweden, pp. 668-673
- [10] Gilman Michael, (2004), "Nuggets and Data Mining", Data Mining Technologies Inc. Melville, NY 11714, (631) 692-4400
- [11] Hill T, Lewicki.P, (2007), "STATISTICS: Methods and Applications", Statsoft, Tulsa, OK
- [12] Kelly Chuck, (2002), "What is the role of Genetic Algorithms in Data Mining", Information Management: How your Business Works, Electronic Newsletter, <http://www.information-management.com/news/5755-1.html>
- [13] M. H. Dunham, (2005.), "Data Mining-Introductory and Advanced Topics", Prentice Hall
- [14] P. Bergeron, C.A. Hiller, (2002), "Competitive intelligence", in B. Cronin, Annual Review of Information Science and Technology, zedford, N.J.: Information Today, vol. 36, chapter 8.

Impact of Internet on Banking Sector

Mukta Sharma

Research Scholar, TMU, Moradabad

Abstract – Developments in technology are changing dramatically the way retail banks conduct their business and over the last decade, the pace of change has accelerated due to the introduction of the internet and the subsequent evolution of internet banking. The retail banks are now offering their services majorly through their internet branches as their products are intangible and thereby easier to deliver electronically. This paper describes the current state of Internet banking in India and discusses its implications for the Indian banking industry. A qualitative research was adapted from both customers in the form of questionnaire & banking perspectives through personal interview. Particularly, it seeks to examine how the banking industry uses Information Technology to its advantage and as a competitive edge, the study also focuses on how the automation and IT enabled Banking helps in controlling costs, how the banking industry uses methods of direct banking as a marketing tool, and also to find out how IT can be used more effectively in the banking sector. The result of the present study shows that the Internet is a convenience tool available whenever and wherever customers need it. It is concluded that the internet has an important and positive effect on customer perceived banking services and the service quality has been improved since the internet has been used in banking sector.

Keywords: Banking, Internet, Internet banking, India

INTRODUCTION

With the advancement of information technology and to derive the inherent advantages of its implementation, there was a long felt need to give recognition to the electronic means as an alternative to paper based banking practice in India. The evolution of banking technology has been mainly driven by changes in distribution channels as automated teller-machine (ATM), phone-banking, tele-banking, pc-banking and most recently internet banking etc. In the traditional banking system a person had to go to a bank branch to deposit or withdraw money and get a bank statement book manually updated by a teller over the counter. With the successful diffusion of mobile phones, phone banking is moving into a next phase of development. However, one of the most substantial changes in banking technology is the recent introduction of internet banking.

ONLINE BANKING PIONEER IN INDIA- ICICI

- First bank to launch website - 1996
- First Bank to launch Internet Banking - 1997
- First Bank to launch online bill payment-1999
- Only Bank in India with million online customers
- Monthly average transactions per online customer

IMPACT OF IT IN BANKING SECTOR

In general, existing studies have concluded two positive effects regarding the relation between IT and banks' performance.

- IT can reduce banks' operational costs through the online channel, while focusing their resources into specialized, high-value added transactions.
- IT can facilitate transactions among customers within the same network like On-Line Return Filing System, Centralized Data Base Management System (CDBMS), Structured Financial Messaging System (SFMS).

CONCERNS & ISSUES

- Convenience factor
- Migration from existing to new systems
- Changing the habits
- Reduction in staffing.
- Security is rated as the most important issue of online banking.
- There is a dual requirement to protect customers' privacy and protect against fraud.

RESEARCH METHODOLOGY

The methodology used is descriptive in nature, which aims to analyze the impact of Information Technology in the banking industry, and how bank use technology to their advantage. The total sample size was fixed at 100(customers and bankers), in view of time and cost considerations. The study was limited to Delhi and NCR. The questionnaires were distributed among the different age groups, and varied professionals. In order to arrive at possible hypotheses lot of secondary data has been collected to understand the market structure of the Indian banking industry. A number of management and e-commerce journals have been referred to get a holistic view about the customer's concern when considering the banking option. The sampling design adopted for this study is non-probability convenience sampling.

LITERATURE REVIEW

In India still there is lack of users for internet as a medium for banking purpose, but the banking system is upgrading and bringing many electronic banking mediums for customers so that banking can be made more convenient.

Joseph *et al.* (1999) investigated the influence of internet on the delivery of banking services. They found six underlying dimensions of e-banking service quality such as convenience and accuracy, feedback and complaint management, efficiency, queue management, accessibility and customization.

Mohammad Reza Nami (2009) has shed the light on information technology as it has become an important factor in the development of financial services industry, and especially banking industry. Growing international trading and problems in transferring money have motivated researchers to introduce a new structure. E-banking is such an idea that most of banks are using the Internet as a new distribution channel. He had reviewed e-banking describing definition, barriers, benefits from the customers', economy, and bank point of views, and main issues and challenges such as risk management and factors responsible for e-banking development. All major banks have declared e-business as one of the core strategies for the future developments. Most of banks use Internet as a new distribution channel. Developing banks served e-banking for profitability of their transactions and reducing of costs. These banks are also doing research in this context. M-banking is a further development upon earlier customer channel extensions such as phone banking and online banking. It is defined as a channel whereby customers interact with a bank through a mobile device (e.g. cell phone). This idea can enhance e-banking functionality in future.

Jun and Cai (2001) identified 17 service quality dimensions of i-banking service quality. These are reliability, responsiveness, competence, courtesy, credibility, access, communication, understanding the customer, collaboration, continuous improvement, content, accuracy, ease of use, timeliness, aesthetics, security and divers features. They also suggested that some dimensions such as responsiveness, reliability and access are critical for both traditional and internet banks.

Jayawardhena (2004) transforms the original SERVQUAL scale to the internet context and develops a battery of 21 items to assess service quality in ebanking. By means of an Exploratory Factor Analysis (EFA) and a Confirmatory Factor Analysis (CFA), these 21 items are condensed to five quality dimensions: access, website interface, trust, attention and credibility. From the provider perspective, there are target quality and delivered quality. The focus of process- or supplied quality definition is rather internal than external, and it is defined as conformance to requirements. It lays emphasis on the importance of the management and the supply-side quality, and there is an important role of the process in determining the quality of outcome (Ghobadian, 1994). IAMA report on online banking 2006: 43% of online banking users haven't initiated online financial transaction because of security reasons, 39% haven't started because they prefer face to face, 22% haven't started because they don't know how to use, for 10% sites are not user friendly and for 2% banks are not providing the facility of internet banking. According to research 68% of the customers cannot say that when they will be starting the financial transactions through internet. Maximum numbers of online banking users are male and maximum of them are in age the group of 25-35. Numbers of female users are very less i.e. 17% only. More than 60% of the people who are having accounted with have accounts in 3-4 banks. Only 37% of Indian Internet users come from Top 10 cities i.e. Mumbai, Bangalore, Delhi, Calcutta, Chennai, Pune, Hyderabad, Ahmedabad, Surat and Nagpur. Another day and another number. As per IAMA and I-cube, the number of active Internet user (i.e. ones who logon to Internet atleast once a month) is now 32 million and numbers who have used Internet atleast once stands at 46 million.

Meute r *et al.* (2000) have identified critical incidents of customer satisfaction and dissatisfaction with technology-based service encounters. Given that business-to-business transactions are the fastest growing segment of technology-driven services (Hof, 1999); Meuter and his colleagues (2000) suggested investigating what drives business customer satisfaction or dissatisfaction with technology driven services.

According to Gönroos (1982), customers distinguish the quality of customer interactions that take place during service delivery (functional quality) and the quality of the outcome the customer receives in the service encounter (technical quality).

ADVANTAGES OF ALTERNATE BANKING CHANNELS

Technological factors have played a major role in setting up the competition between different banks. Convenience banking in the form of debit cards, internet and phone-banking, anywhere and anytime banking has attracted many new customers into the banking field. People look forward to use other channels like Internet, mobile and therefore banks are offering high levels of services to customers through these low cost channels can be beneficial to the bank in two ways

- Reduced Transaction cost
- Increased Customer Satisfaction

Focus on the Customer

Community banks now can concentrate on standing out from the competition. It benefits the bottom line to avoid tedious, imprecise paper-based processes, because these require considerable time and effort from employees. Using web-based banking tools to expedite routine processes allows employees to focus on their most important role-serving the customer.

Affordable for Every Institution

With minimal capital outlay, community banks can afford web-based banking technology. Many solutions offer transactional-based pricing, which allows banks to pay only for the services they request and execute. Today's technology allows every size institution to utilize the same web-based banking tools that were developed to serve the largest financial institutions. These technological advancements help community banks to compete on an even playing field.

Easy to Implement & Update

Implementation of integrated banking technology solutions is highly flexible, so that community banks can quickly transition with few internal resources. Many web-based banking tools require only an Internet browser and can easily be incorporated into existing operations. As regulations change, technology updates are seamless, requiring no disruption of day-to-day services.

Improvement in the Bank's Profitability

- Banks have seen immediate improvements in profitability through cross-selling opportunities and decreased channel costs through an increased understanding of customer channel utilization. The bank is also using the data to develop targeted marketing campaigns, offer new services and continue to provide the highest customer service, for which it has been known over the years.
- A great achievement has been the migration of customers from costly, unprofitable channels like brick and mortar branches to less costly, profitable channels like on-line banking.
- In addition to this, bank can know how much it is investing in maintaining every customer relationship. Which channels does a particular customer prefer to use? Does he use the more intensive support services like phone banking? Or is he comfortable using the net banking services? Is he a high value customer, for whom phone banking is a value addition? Or is he a low value customer who doesn't merit personalized attention like phone banking? By having this information available readily, banks have been able to do effective customer portfolio analysis and hence can take decisions about which customers it needs to invest in.

Changing Face of Banking Services

Liberalization brought several changes to Indian service industry. Probably Indian banking industry learnt a tremendous lesson. Pre-liberalization, all we did at a bank was deposit and withdraw money. Service standards were pathetic, but all we could do was grin and bear it. Post-liberalization, the tables have turned. It is a consumer-oriented market there. Retail banking in India is maturing with time, several products, which further could be customized.

Based on the Analysis

Fig. 1.1 shows the varied channels offered by the banking sector.

The table & Fig. 1.2 shows the popularity due to ease of use of the two different types of banking:

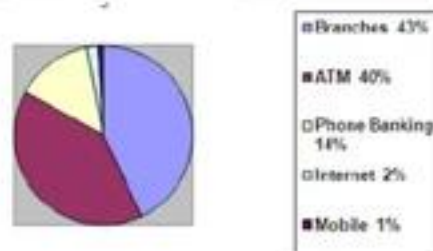
Direct Banking and Personal Banking. In the age group 20-30, Direct Banking is the most popular.

Normally, as it can be seen in the table & Fig. 1.3, Hacking of the confidential details of the account and improper knowledge to use the technology are the most dreaded fears across both the genders.

The table & Fig. 1.4 depicts the type of Direct Banking Channel used by the respondents. Kotak, ICICI customers are very comfortable with Net Banking whereas ATM Banking is the most widely used in SBI.

It is shown in the table & Fig. 1.5 the factors which are kept in mind by the respondents while using the Direct Banking facilities. Safety comes out to be the most important criteria, almost across all age groups.

As it is evident from the Figure representation shown in 1.6, account information is the number one reason for the bank customers to opt for direct banking channels, across both genders.



Tables & Fig.

% Customer Initiated Transactions by Different Channels*

Tables & Fig.

% Customer Initiated Transactions by Different Channels*

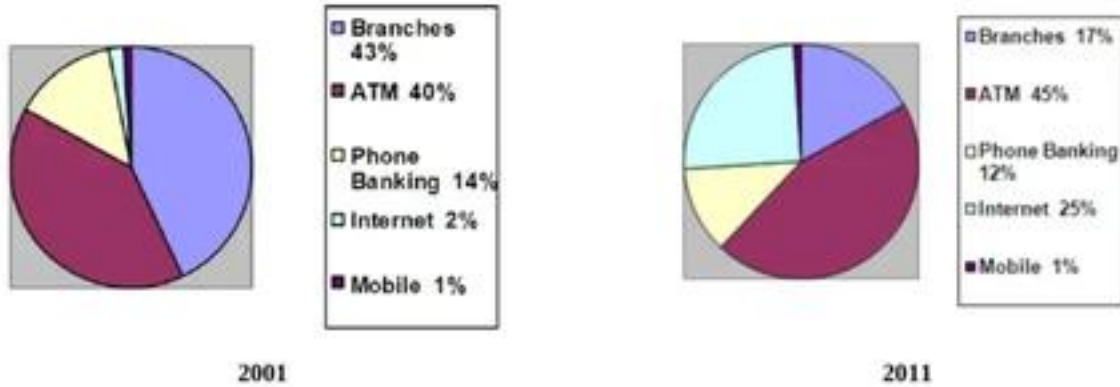


Fig. 1.1

*For the Indian Banking industry

Table 1.2: Profiles of the Respondents

Gender	Occupation				Total
	Business	Student	Service	Others	
Male	19	15	20	11	65
Female	7	16	9	3	35
Total	26	31	29	14	100

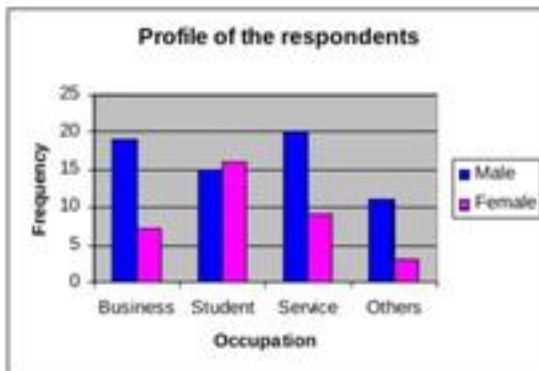


Fig. 1.2

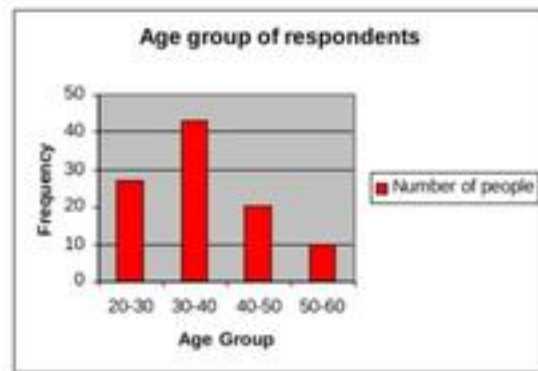


Fig. 1.3

Table 1.3: Age Groups of the Respondents

Age Group	Number of People
20-30	27
30-40	43
40-50	20
50-60	10

Table 1.4: Bank Preferences of the Respondents

Bank	Number of People
ICICI	10
Kotak	60
SBI	10
HDFC	15
Others	5

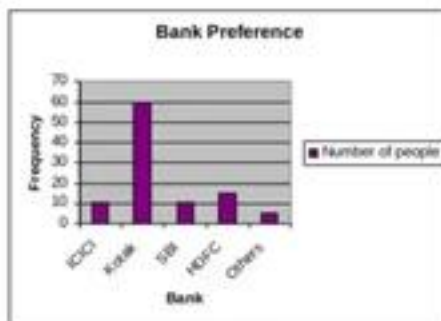


Fig. 1.4

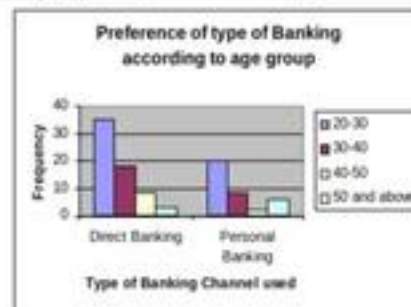


Fig. 1.5

Table 1.5: Banking Conveniences

Age	Types		Total
	Direct Banking	Personal Banking	
20-30	35	20	55
30-40	18	8	26
40-50	8	2	10
50 and above	3	6	9
Total	64	36	100

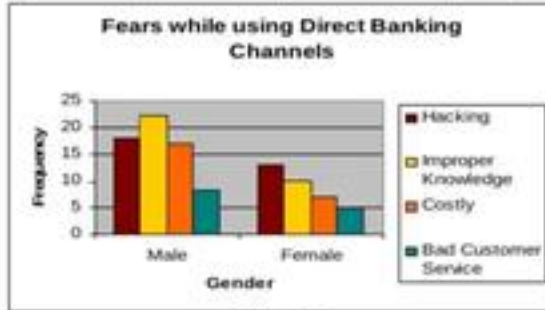


Fig. 1.6

Table 1.6: Fear while using DBCs

Gender	Fears				Total
	Hacking	Improper Knowledge	Costly	Bad Customer Service	
Male	18	22	17	8	65
Female	13	10	7	5	35
Total	31	32	24	13	100

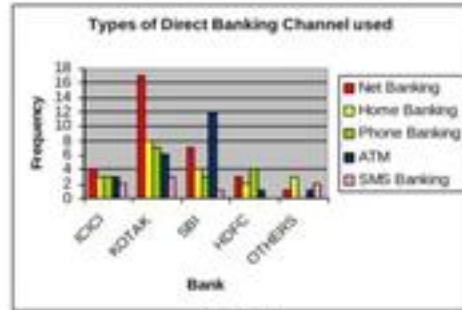


Fig. 1.7

Table 1.7

Bank	Direct Banking Channel				
	Net Banking	Home Banking	Phone Banking	ATM	SMS Banking
ICICI	4	3	3	3	2
KOTAK	17	8	7	6	3
SBI	7	4	3	12	1
HDFC	3	2	4	1	0
OTHERS	1	3	0	1	2

Table 1.8: Profile of the Respondents

Age	Advantages				Total
	Safety	Speed	Feasibility	Reliability	
20-30	16	18	12	9	55
30-40	13	3	5	5	26
40-50	3	4	1	2	10
50 and above	4	0	2	3	9
Total	36	25	20	19	100

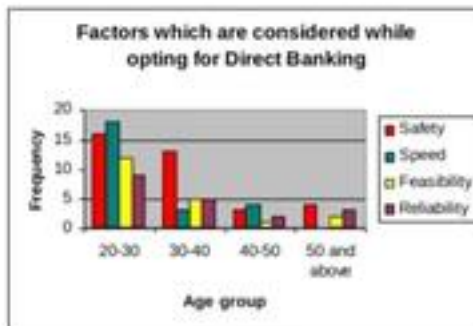


Fig. 1.8

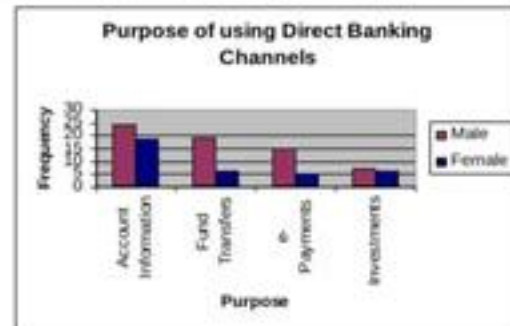


Fig. 1.9

Table 1.9: Profile of the Respondents

Gender	Purpose				Total
	Account Information	Fund Transfers	e-Payments	Investments	
Male	24	19	15	7	65
Female	18	6	5	6	35
Total	42	25	20	13	100

CONCLUSION

All these developments in Indian banking depicts that, the Indian banks are marching towards modern banking and changing their traditional look. It is great change of banking industry because of information technology development. Bank offers most of the direct banking services free of charge. Most of the customers are satisfied with direct banking facilities offered by banks. Net banking emerged as the most popular mode of accessing the direct banking among all the other direct banking channels. Most of the people who have their account in different banks use direct banking channels for knowing their account status or for various account related information. Most of the male customers have fear of improper knowledge while using different direct banking channels while the female customers have fear of hacking of their accounts while using direct banking channels.

From the study, we can observe that persons belonging to the age group of 20-30 years find direct banking more convenient than personal banking and give more importance to speed.

Adequate harnessing of technology by the banks have made it easier for the banks to cut costs in the increasing competitive environment and also, at the same time use it as a marketing strategy to gain an edge among the other players in the market. Customers are directed to alternate channels of banking, which costs the bank a meager amount whereas if, the same customer walks in any branch, it costs the bank Rs.27 per walk-in. Thus, IT application has been a boon to the industry and more developments will further help the banks in this global market place.

REFERENCES

- [1] Kothari, C.R. (2009, II edition) *Research Methodology: Methods and Techniques*, New Age International Publications, New Delhi.
- [2] Mohammad Reza Nami, *E-Banking: Issues and Challenges*, 10th ACIS International Conference on Software Engineering, Artificial Intelligences, Networking and Parallel/Distributed Computing, 2009
- [3] http://www.swissbankservices.com/articles/History_of_Internet_banking.html
- [4] Pasquet Marc, Alimi Vincent, Vernois Sylvain, Rosenberger Christophe, *An E-banking platform for collaborative work between Education, Industry and Research*, 978-1-4244-2249-4/08,2008, IEEE.
- [5] Sayar Ceren, Wolfe Simon, *Internet banking market performance: Turkey versus the UK*, *International Journal of Bank Marketing*, Vol. 25 No. 3, 2007, pp. 122-141
- [6] <www.kotak.com>
- [7] <<http://www.infosys.com/finacle/solutions/thought-papers/Documents/overview-multi-channel.pdf>>
- [8] <http://findarticles.com/p/articles/mi_m3311/is_n11-12_v27/ai_12382881/>
- [9] <http://www.cisco.com/web/IN/about/files/tech_in_banking.pdf>
- [10] <https://www.valueland.ca/download/Articles/The_adoption_of_virtual_banking_1999.pdf>
- [11] <http://www.asianlaws.org/project/impact_banking.htm>
- [12] <<http://www.expreecomputeronline.com/20020916/indtrend.shtml>>
- [13] <<http://www.indianserver.com/biz/indian-banking-sector.html>>
- [14] <<http://www.indianfoline.com/nevi/bank.html>>
- [15] <<http://www.banktech.com/index.jhtml;jsessionid=CXFKKHQIGVONPQE1GHPSKHWATMY32JVN>>
- [16] <<http://www.hdfcbank.com/>>
- [17] <<http://www.iflexsolutions.com/>>
- [18] <<http://www.reveleas.com/customer/>>
- [19] <www.rbi.org.in>
- [20] <www.icicibank.com>
- [21] <www.hewittasia.com>
- [22] <www.kotakcards.com>
- [23] <<http://www.ibef.in/industry/banking.aspx>>
- [24] <http://www.3iinfotech.com/content/payment_solutions/cheque_truncation_system.aspx>
- [25] <http://www.ehow.com/about_5167287_point-sale-transaction.html>
- [26] <<http://www.merineews.com/article/nefrings-revolution-in-cost-effective-domestic-money-transfer/128575.shtml>>
- [27] <www.iba.org.in>
- [28] <<http://www.cyberpolicebangalore.nic.in/cybercrimes.htm>>
- [29] <<http://www.419scam.org/>>
- [30] <<http://www.entrust.com/>>
- [31] <<http://www.instantssl.com/ssl-certificate-products/https.html>>
- [32] <<http://info.ssl.com/article.aspx?id=10241>>
- [33] <<http://www.indiastudychannel.com/resources/79870-CBS-Core-Banking-System.aspx>>
- [34] <http://finance.indiamart.com/investment_in_india/visa_money_transfer.html>
- [35] Intranet of Kotak Mahindra Bank Limited
- [36] <<http://brent.tvu.ac.uk/dissguide/hm1u1/hm1u1text2.htm>>
- [37] <http://ccmtl.columbia.edu/projects/qmss/samples_and_sampling/types_of_sampling.html>

E-Learning: A Need of Today's Market

Surbhi Dwivedi¹ and Mukta Sharma²

¹Software Engineer, NCR Corporations India Pvt Ltd.

²Research Scholar Teerthanker Mahaveer University

Abstract—E-Learning is on the minds of many educationists in higher education as well as in the corporate training world. A highly competitive environment and constantly changing market needs and trends have created the need for highly skilled people in the workplace. This has challenged businesses to look at better ways to improve the efficiency of their human resource. Both Private and Public organizations are focusing on realigning, reengineering, retooling, redefining, redesigning, rethinking, resizing, repositioning, renewing and reinventing themselves to meet the demands of an increasingly demanding customer base. Jay Cross has written in a document called The Cluetrain Manifesto that "Markets are getting smarter, more informed, more organized. People in networked markets have figured out that they get far better information and support from one another than from vendors". This paper will depict the trends, goals and benefits of E-learning so that the executives deliver the result in the organization and organization need not spend so much money and time in training the executives.

Keywords: E-learning, Internet, Synchronous, Assessment.

INTRODUCTION

There is a considerable advance in the Information and Communication Technologies in the last few years. This ever increasing amount of data requires the development of more efficient tools to the task of managing, analyzing and to keep pace with this growth. In the past years, the design and implementation of web-based education systems have grown exponentially, spurred by the fact that neither students/employees nor teachers/trainers are bound to a specific location and that this form of computer-based education is virtually independent of any specific hardware platforms. With the invention of INTERNET it has gifted various utilities; one of it is e-learning. The Internet and the advance of telecommunication technologies allow us to share and manipulate information in nearly real time.

The Internet takes this process of delocalization of the educative experience to a new realm. The world is going fast towards online learning, so we can see a lot of open universities that provide course online though the internet, even many of the good colleges and universities besides providing traditional teaching they are making use of education portal using a concept of Blend Learning. At the same time, we can observe lots of advertisements for online professional certificate courses, so one can study and take the exam and get certified (without the previous hassle of attending classes, traveling). Every organization would look at E-Learning information from different angles according to the mission, vision and objectives of the organization and whether it looks for profit or has other national objectives. This could be seen as a blessing: plenty of information readily available just a click away.

E-LEARNING

"The delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device (e.g. a mobile phone) in some way to provide training, educational or learning material."-Derek Stockley 2003

If executive development doesn't clearly and directly support the achievement of the organization's strategic objectives, then one shouldn't waste valuable time and money in doing it. Today the emphasis is on developing both the organizational and individual capabilities. Leadership competencies have become a core dimension of development activities; learning methods have evolved to become more action oriented and executives apart from taking an active interest in developing themselves have come to realize the impact of executive development.

E-Learning (also referred to as web based education and e-teaching) is a new context for education where large amounts of information describing the continuum of the teaching-learning interactions are endlessly generated and universally available. E-learning is not only suited to distance learning and flexible learning, but can also be used with face-to-face teaching. E-Learning pioneer Bernard Luskin argues that the "E" must be understood to have broad meaning if e-Learning is to be effective. Luskin says that the "e" should be interpreted to mean exciting, energetic, enthusiastic, emotional, extended, excellent, and educational in addition to "electronic" that is a traditional national interpretation. This broader interpretation allows for 21st century applications and brings learning and media psychology into the equation. E-Learning can also refer to educational web sites such as those offering online student support services, such as online advising and registration, e-counseling, online textbook purchase, learning scenarios, worksheets and interactive exercises for children. The term is also used extensively in the business sector where it generally refers to cost-effective online training.

WHAT IS THE SCOPE AND STATUS OF E-LEARNING?

E-learning is now a multi-billion dollar industry worldwide. Companies & Education industries like- IBM, ICICI Bank, HDFC Bank, Motorola, Harvard, Cambridge, RDIAS to name a few are using e-Learning to a great extent. In this challenging economy, organizations are cutting back on some of the more costly components of learning.

- There appears to be an emerging feeling that more can be done with less, that excellent design and a sharp focus on real performance problems are what it's all about.
- Simulation is increasingly seen as the instructional design of choice for asynchronous online learning. There are more and more proven tools and templates available now to create simulations, as well as experienced service providers to help out; so this challenging class of e-learning is becoming more manageable, even without a high-end budget.
- The use of story and narrative to support simulation and other types of e-learning is taking hold. Some designers are becoming masters in the use of story to engage learners and promote challenging educational goals.
- Uses of online human agents are varied and creative. The result is e-learning which personalizes sometimes dry technical content and maintains learner motivation.
- The previous focus on IT e-learning shows signs of lessening. World-class designers are now using online learning in remarkable ways to meet tough learning challenges in an ever-widening range of human skill areas.
- Award-winning e-learning is increasingly being developed for innovative organizations in the nonprofit sector, an "industry" in which e-learning has terrific potential."

Goals & Trends in E-Learning

Amongst the many methods of development available today for executives include executive education, custom in-house programmes, business simulations, e-learning, experiential learning, action learning, executive coaching and leaders as teachers. At the end of the day, it will be the organization's business strategy combined with the executive's personal leadership path which will help determine the right blend of internal and external development opportunities needed for success.

Computer-aided Assessment (also but less commonly referred to as E-assessment), ranging from automated multiple-choice tests to more sophisticated systems is becoming increasingly common. Now day's companies are conducting online tests and certification courses for their employees like –Amfi, IRDA etc. With some systems, feedback can be geared towards a student's specific mistakes or the computer can navigate the student through a series of questions adapting to what the student appears to have learned or not learned.

TO DEVELOP AND MANAGE E-LEARNING

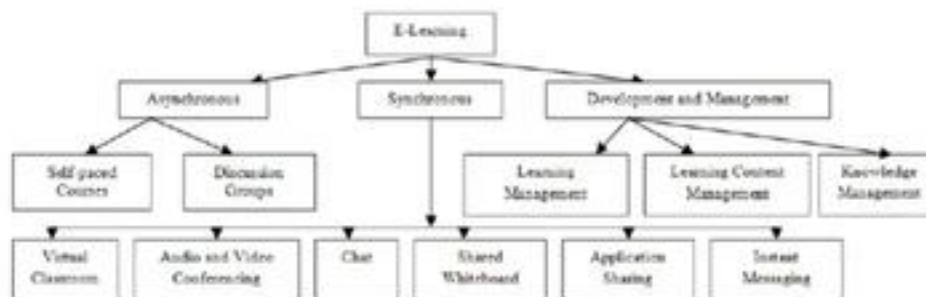


Fig. 1

Asynchronous e-Learning: Place and time independent

Self-Paced Courses

- The obvious advantage of a self-paced course is convenience. People can get the training they need at any time. This can include just-in-time training where a person gets exactly the training he or she needs to perform a task. Self-paced courses can be delivered in many ways including: internet, CD-ROM/DVD. Self-paced courses can have features like-Multimedia, Interactivity, Bookmarking, Tracking, Simulation, Online Experts, Search, Notes and Highlights
- Some challenges faced during self-paced courses is many people need external motivation to take and complete a course of study. Since self-paced courses can be offered without a teacher and without a required completion time there may be many learners who will not enroll or complete the course work. You must be sure that there are professional and/or personal incentives for your learners to take and complete self-paced courses

DISCUSSION GROUPS

A discussion group is a collection of conversations that occur over time. Other names for discussion groups are message boards, bulletin boards and discussion forums. A discussion group might start out as a question from an individual. Some time later, another individual responds to that question. Others can respond to the question (creating a thread) or they can start their own conversation (forming another thread). A threaded discussion might also start with a teacher asking an open-ended question that leads to a class discussion. Discussion groups can be used to support a group of people taking the same class or can be used to support people performing similar tasks.

SYNCHRONOUS E-LEARNING

Lets teachers conduct classes over the Internet. The synchronous technologies also allow people to interact with peers and experts.

Virtual Classroom

A virtual classroom duplicates the capabilities found in a real classroom. A virtual classroom provides:

A place to meet

Students and teachers use their computers to go to a virtual meeting place instead of a classroom.

Mark attendance

A list of students is recorded.

Deliver a Lecture

Teachers can choose from a variety of synchronous technologies including:

- Slide presentation
- Audio and video conferencing
- Application sharing
- Shared whiteboard

Interaction with students

Students can indicate when they want to speak by virtually raising their hand. Teachers can let students speak through audio and video conferencing. Teachers and students can use instant messaging and chat.

Online Test

Teachers can present questions to students.

Breakout Sessions

Students can work together in groups.

Audio and Video Conferencing

- Computers connected to the Internet via digital camera for Video conferencing. Common names for this kind of implementation are IP Audio Conferencing or Voice-over-IP. People dial the same number to participate in an audio conference.
- Special video conferencing devices that connect over the Internet or over phone lines.

Chat

Chat allows several people to communicate with each other. Each participant uses a computer to type their comments. The other participants can see the name of the person and their comments.

Shared Whiteboard

A shared whiteboard lets a group of people communicate by typing comments, drawing, highlighting and pointing. A shared whiteboard is a common feature within virtual classroom.

Application Sharing

You can demonstrate how to use software applications to remote learners with application sharing. A teacher can also let the learner take control of the application to practice performing tasks.

Instant Messaging

Instant messaging is similar to chat. One person communicates to another through typing. Instant messaging also provides some additional features. With instant messaging, you can keep a list of people that you might like to chat with. The list will indicate if they are online, offline, available for chat or busy. These features make instant messaging an excellent tool for learning from peers.

DEVELOPMENT & MANAGEMENT

Learning Management Systems

A Learning Management System (LMS) manages the process of learning & provide reports for self-paced courses and/or instructor-led courses. They also manage Groups (i.e. organizations within a company, jobs, geographical, working groups) & Administrative permissions (who can access data, who can perform certain functions), Training management (Scheduling and access to virtual classes, Creation of blended learning, Assignment of training based on certification requirements), Employee management (Skill assessment, Assignment of training based on skills, Performance reviews, Recruiting)

Learning Content Management Systems

A Learning Content Management System (LCMS) supports team-based development of self-paced courses. They focus on Development tools (check-in/check-out, version control), Project management tools (assignment, completion reports) & Quality assurance tools (reviews, approvals, bug tracking)

Knowledge Management

Knowledge management systems provide direct support for employees as they do their job. Many types of systems are referred to as knowledge management systems like Document Management, Knowledge capture, Information portals, and Search tools

TRADITIONAL LEARNING VS E-LEARNING

	Traditional Classroom Learning	E-Learning
Advantages	Immediate feedback	Learning-centered and self-paced
	Familiar to both instructors and students	Time and location flexibility
	Motivates students	Cost-effective for learners
	Cultivation of a social community	Potentially available to global audience
Disadvantages		Unlimited access to knowledge
		Archival capability for knowledge reuse and sharing
	Instructor-centered	Lack of immediate feedback in asynchronous e-learning
	Time and location constraints	Increased preparation time for the instructor
	More expensive to deliver	Not comfortable for some people; requires more maturity and self discipline
		Potentially more frustration, anxiety, and confusion

BENEFITS OF E-LEARNING

E-learning has definite benefits over traditional classroom training. While the most obvious are the flexibility and the cost savings from not having to travel or spend excess time away from work, there are also others that might not be so obvious. The only way to really assure competency through training is for the provider to analyze necessary tasks and have people actually perform those tasks during the training. Collecting feedback (online data) more and more focused training can be designed.

1. It's less expensive to produce - To produce your own asynchronous training programs, e-training is virtually free once you reach the break-even point. Synchronous programs will have continued costs associated with the instructor managing the class, but will still be lower than traditional courses.
2. It's self-paced - Most e-learning programs can be taken when needed. The "lectures" that you set up allows the learner to go through smaller chunks of training that can be used and absorbed for a while before moving on.
3. It moves faster - According to an article by Jennifer Salopek in "Training and Development Magazine," e-learning courses progress up to 50 percent faster than traditional courses. This is partly because the individualized approach allows learners to skip material they already know and understand and move onto the issues they need training on.
4. It provides a consistent message - E-learning eliminates the problems associated with different instructors teaching slightly different material on the same subject. For company-based training, this is often critical.
5. It can work from any location and any time - E-learners can go through training sessions from anywhere, usually at anytime. This Just-In-Time (JIT) benefit can make learning possible for people who never would have been able to work it into their schedules prior to the development of e-learning. (If you manage a corporate learning program, however, be careful about requesting that workers learn on their own time from home.)
6. It can be updated easily and quickly - Online e-learning sessions are especially easy to keep up-to-date because the updated materials are simply uploaded to a server. CD-ROM-based programs may be slightly more expensive to update and distribute, but still come out cheaper than reprinting manuals and retraining instructors.

7. It can lead to increased retention and a stronger grasp on the subject—This is because of the many elements that are combined in e-learning to reinforce the message, such as video, audio, quizzes, interaction, etc. There is also the ability to revisit or replay sections of the training that might not have been clear the first time around.
8. It can be easily managed for large groups of students - To keep track of the course offerings, schedule or assign training for employees and track their progress and results. Managers can review a student's scores and identify any areas that need additional training.
9. Reducing environmental impact: e-Learning allow people to avoid travel, thus reducing the overall carbon output. The fact that it takes place in a virtual environment also allows some reduction of paper usage. With virtual notes instead of paper notes and online assessments instead of paper assessments, eLearning is a more environmentally friendly solution.
10. Quality education, made affordable: The fact that instructors of the highest caliber can share their knowledge across borders allows students to attend courses across physical, political, and economic boundaries. Recognized experts have the opportunity of making information available internationally, to anyone interested at minimum costs. This can drastically reduce the costs of higher education, making it much more affordable and accessible to the masses. An internet connection, a computer, and a projector would allow an entire classroom in a third world university to benefit from the knowledge of an opinion leader.

CONCLUSION

“The use of network technologies to create, foster, deliver, and facilitate learning, anytime and anywhere.”

E-Learning can provide for major benefits for the organizations and individuals involved. Reducing environmental impact: E-Learning allows people to avoid travel. The fact that it takes place in a virtual environment also allows some reduction of paper usage. You would not need e-learning. In the real world, people have jobs to do and budgets are limited. Your learning program will need the power of technology to overcome the limitations of time, distance and resources.

REFERENCES

- [1] Barry, John, *The E-learning Factor*, November (2000).
- [2] Chapnik, Samantha, *E-learning Readiness Model*, April 2002
- [3] Downes, S (2005), *E-Learning 2.0*
- [4] Elias M. Awad: *Electronic Commerce*, PHI, 2008
- [5] *E-moderating: The Key to Teaching and Learning Online*-Gilly Salmon, Kogan Page, 2000
- [6] Graziadei, W. D., et al., (1997), *Building Asynchronous and Synchronous Teaching-*
- [7] <http://derekstockley.com.au/elearning-definition.html>
- [8] *Learning Environments: Exploring a Course/Classroom Management System Solution*
- [9] <<http://conferences.sigcomm.org/>>

Cyber Laws: A Prerequisite against Cyber Crime

Shikha Garg¹, Gulista Khan² and Swati Verma³

¹CMCA, TMU, Moradabad

²COE, TMU, Moradabad

Abstract—Nowadays the use of computer electronic device and other things are increasing. Safety of these things becomes necessary, for that there exist some Cyber laws for Cyber Crimes. We can access the data and information from all over the world by using internet. After the development of internet, computer is a one of the most important tool for the cyber. Most of financial and non-financial activities are done with computer and computer related services such as Internet. We need such laws so that people can perform, purchase transactions over the net through credit cards without fear of misuse. The Cyber Laws must offer the much needed legal structure so that information is not denied legal effect, solely on the ground that it is in the form of electronic records. In the view of enlarge in transactions and communications carried out through electronic records, the act seeks to empower government departments to accept filing, creating and maintenance of official documents in the digital format. In this paper we are going to highlight some broad areas of Cyber crimes and about its only solution.

Keywords: Security attacks, security services, Cyber laws against Cyber Crimes.

INTRODUCTION

The history of crime and the prevention of crime have been related to the history of warfare: an offense is developed, then a defense counters the offense, then a new offense counters the new defense. Machine guns led to the development of tanks which led to the development of rocket propelled grenades, etc. More recently, with the advent of the railroads came Jesse James, countered by the Pinkerton [9] and so on. Airlines discovered airline hijackers and parried the threat with the unbearable experience they call airport security. In the present conditions of economic crisis with thousands of recently fired, super-computers techies on the loose, the venue for those of dishonest crooked is the cyber-world. The newest bandits are the malicious professional "hackers" who are not only well organized but will strike with proven military precision driven by monetary gain. Thus, businesses must learn to be on guard and protect their cyber property, such as Intellectual Property (IP), which frequently accounts for 70% of the market value of companies that specialize in franchising and licensing.

The generally accepted definition of cyber security is the security of any computer system, software program, and data against unlawful use, disclosure, transfer, modification, or destruction, whether accidental or intentional. Cyber attacks can come from internal networks, the Internet, or other private or public systems. Businesses cannot afford to be unconcerned of this problem because those who don't respect address, and counter this threat will surely become sufferers.

CYBER CRIME-A BOOMING INDUSTRY

Table 1: Report on Underground Economy [10]

Our Data	Underground Price
Credit card details	Rs. 100-4,500
Netbanking Details	Rs.4000-35,000
Publishing, promoting and hosting fake online e-stores/web pages	Depends on Project
MoneyLaundering(frombank accounts,online money transfers)	Between 10 & 40 percent of the total Amount
Designing and mailing bulk spam mails	Rs.5000 and onwards
Bulk e-mail address	Rs.750-10,000
Passport/Id cards/Pan or social service data	Appro. Rs.8,700/individual's data

(Source: An article, "Cyber Crime is now a booming industry" by Priyanka Joshi in Business Standard, Jan 23, 2012)

Cyber-crime is on the rise. On average, there has been a reported cyber security event every single day since 2006. If there's a transaction that involves a card with a magnetic strip and a swipe, there's a transaction that involves a risk. And if there's a computer system with software designed to allow access by multiple users (e.g. by franchisees, vendors, or other providers) without security in mind, then there's a major risk of being hacked for malicious[8] or competitive purposes. With the proliferation of free hacking tools and cheap electronic devices such as key loggers and RF Scanners, if you use e-mail or your company's systems are connected to the Internet, you're being scanned, probed, and attacked constantly. E-mail and the web are the two main attack vectors used by hackers to infiltrate corporate networks.

Below are some risks that have formulated based on the potential harm that can be caused:

Low Risk

Hacker has gained entry to system but minimally. Minor risk of business disruption, but access can aid attackers in information gathering and planning future attacks.

Medium Risk

Malware has been implanted in the company's network, which could cause malfunctions and mischief. There is a significant risk of a business disruption that could result in financial loss and/or damage of goodwill.

Medium-to-High Risk

Using sniffers or other equipment, hackers have obtained Personally Identifiable Information (PII) from Point of Sale (POS) systems. There is a significant risk of a business disruption that could create financial loss and/or damage of goodwill.

High Risk

Inside job: data stolen by disgruntled employee. There is a potential risk of business disruption, resulting in financial loss and damage of goodwill. PII may be taken, as well as company's confidential information and financial information.

Critical Risk

Hackers have gotten into the system and can access PII as well as the company's financial information and confidential information. There is a severe risk of business disruption, financial loss, damage of goodwill. System, application, and database have been compromised.

CYBER CRISIS MANAGEMENT

IT (Information Technology) systems are vulnerable to a variety of disruptions from a variety of sources such as natural disasters, human error, and hacker attacks. These disruptions can range from mild (e.g. short-term power outage, hard disk drive failure) to severe (e.g. equipment destruction, fire, online database hacked). Crisis (and Disaster Recovery) planning refers to those interim measures needed to recover IT services following an emergency or system disruption. Interim measures may include the relocation of IT systems and operations to an alternate site, the recovery of IT functions using alternate equipment, or the performance of IT functions using manual methods to minimize the business impact.

In January 2009 Heartland Payment Systems [7], which processes 100 million credit and debit card transactions per month, disclosed that hackers had penetrated its computer network. By installing malicious software, the hackers gained access to digital information encoded on a card's magnetic strip that could be used to create duplicate cards. The Heartland debacle highlights the potential fallout companies' face as a result of ineffective planning for data security breaches. The costly consequences may include damage to reputation and brand value, shareholder derivative suits, directors' and officers' liability, regulatory agency investigations, and class-action litigation.

Effective crisis planning and crisis management processes must be developed to enable businesses to continue operating following failure of, or damage to, vital services or facilities.

The Cyber Crisis Planning Process

- Identification and prioritization of critical business processes including the technology that supports them (servers, databases, applications) and technology owners.
- Identification and agreement with respect to all responsibilities and emergency arrangements for business continuity planning and recovery with all affected parties throughout the organization.
- 'Call Tree' and contact details.
- Documentation of workarounds (electronic and manual) and/or rectification procedures and a linkage to any relevant reference material or documents.
- Appropriate education of staff in the execution of the agreed emergency procedures and processes.
- Checklists and procedure guidelines to assist all parties to recover from a crisis or disaster.
- Testing and updating of the plans on a regular basis.

Cyber Crisis Management Process**Identify the Crisis at Hand**

For example, is it a customer data breach, privacy breach, virus outbreak, targeted malicious code attack, denial of service attack, phishing attack, or third party data compromise?

Analysis and Assessment

Triage of the incident to determine the severity and impact on the business.

Coordination/ Response Plan

Decide whether to protect or prosecute including contacting the proper law enforcement authorities. If prosecution is the course of action, all evidence (system/application logs, audit trails, and affected systems) must be collected in a forensically sound manner to hold up in a court of law. Contact all affected parties and communicate and agree upon a response plan.

Containment/ Recovery Plan

Restore affected systems to normal business operation.

Incident Learning

What can be learned from this incident? What can be improved so this type of incident does not again?

THE CYBER CRIME LAWS OF DIFFERENT NATIONS

Based on its findings in the E-Readiness study, and in the wake of the Philippines inability to prosecute the student responsible for the "I Love You" virus, McConnell International [1] surveyed its global network of information technology policy officials to determine the state of cyber security laws around the world.

Countries that provided legislation were evaluated to determine whether their criminal statutes had been extended into cyberspace to cover ten different types of cyber crime in four categories: data-related crimes, including interception, modification, and theft; network-related crimes, including interference and sabotage; crimes of access, including hacking and virus distribution; and associated computer-related crimes, including aiding and abetting cyber criminals, computer fraud, and computer forgery.

Thirty-three of the countries surveyed have not yet updated their laws to address any type of cyber crime. Of the remaining countries, nine have enacted legislation to address five or fewer types of cyber crime, and ten have updated their laws to prosecute against six or more of the ten types of cyber crime.



Fig. 1: Provides a Categorization of the 52 Countries Surveyed

Table 2: Countries with Updated Laws[1]

Country	Data Crimes			Network Crimes		Access Crimes	
	Data Interception	Data Modification	Data Theft	Network Interference	Network Sabotage	Unauthorized Access	Virus Dissemination
Australia	✓	✓	✓	✓		✓	
Brazil		✓			✓	✓	
Canada	✓	✓	✓	✓	✓	✓	✓
Chile	✓	✓	✓	✓	✓		
China		✓		✓			✓
Czech republic		✓	✓		✓	✓	
Denmark		✓		✓			
Estonia		✓	✓	✓	✓	✓	✓
India		✓	✓	✓	✓	✓	✓
Japan	✓	✓	✓	✓	✓	✓	
Malaysia		✓				✓	
Mauritius	✓	✓		✓	✓	✓	✓
Peru	✓	✓	✓	✓	✓	✓	
Philippines	✓	✓	✓	✓	✓	✓	✓
Poland		✓	✓	✓			
Spain	✓	✓	✓				
Turkey		✓	✓	✓	✓		✓
U. K		✓		✓	✓	✓	
U. S	✓	✓	✓	✓	✓	✓	✓

The above table Table2 gives detail which laws have been updated in each of the 19 countries with fully, substantially, or partially updated laws in place. Excerpts from, or the full text of, pertinent statutes are available on the McConnell International website, www.mcconnellinternational.com[1], for each of the countries in Table 2. In Canada, successful prosecutions of computer-related fraud have effectively updated the law. Canada also provides an example of a phenomenon in many countries that law enforcement officials have strong confidence that existing laws provide sufficient coverage against the "computer-related crimes" of aiding and abetting cybercrimes, and computer-related fraud and forgery.

Even among these countries, crimes are not treated uniformly. The above table shows, there is little uniformity across nations in terms of which types of crimes have been addressed through updated statutes.

The penalties provided in updated criminal statutes vary widely. Mauritius, the Philippines, and the United States have stronger penalties than many other countries for convictions of covered cyber crimes.

Finally, of the 33 countries with no updated laws in place, 13 indicated that progress toward the adoption of updated legislation to combat cyber crime is underway. Seven of these 13 countries are in Africa or the Middle East, indicating that, although these regions have not yet adequately addressed the issue of cyber crime.

Progress Underway in 13 Countries without Updated Laws [2]:

Albania

The Authority for the Regulation of Telecommunications began discussions earlier this year on the topic of cyber laws, with the goal of preparing protocols of collaboration and exchanging information.

Cuba

A working group of the Ministry of Justice has planned modifications to the Penal Code.

Gambia

Gambia is planning a national information technology initiative, although the capacity for the drawing up a legal framework is limited. Gambia may look towards international organizations to spearhead this effort so that it could replicate or amend the needed laws. Iran: For the past six years, Iran has examined various aspects of cyber law, although no law or regulation in regard to computer offenses has been implemented. The areas that have been considered are: computer offenses, intellectual property issues, privacy/data protection, and freedom of information.

Kazakhstan

State bodies in Kazakhstan are currently developing a law regarding cyber offences. Also in development is a special state program on the protection of information resources, including technical and software protection.

Latvia

Amendments to the Criminal Code have been drafted envisaging considerable punishment for computer-related criminal acts. Corresponding additions would be made to the Administrative Offence Code.

Lesotho

Lesotho has established special interest groups to look at the various aspects of information security relating to e-commerce.

Malta

In May 2000, Malta announced its goal of providing a strong legal framework for ecommerce, data protection, and computer misuse. The relevant Bills to develop a legislative framework for information practices were published in September 2000 and will be discussed in parliament in the coming months.

Morocco

In Morocco, there is an inter-ministerial commission sponsored by the Prime Minister working on security issues.

New Zealand

At present there are no general computer crime offences in New Zealand. However, the country is currently drafting a Crimes Amendment Bill (No. 6).

Sudan

The Sudan intends to invite lawyers, legislators and computer professionals to a workshop where ideas on the nature of computer crimes and the ways of dealing with them by means of the appropriate legal codes will be exchanged.

Vietnam

Vietnam is in the process of gathering information to make proposals for amendments to its laws.

Zambia

Zambia has made available a draft of its Telecommunications and Information Technology Council Act.

ONLY SOLUTION FOR CYBER CRIMES

Extending the rule of law into cyberspace is a critical step to create a trustworthy environment for people and businesses. Because that extension remains a work in progress, organizations today must first and foremost defend their own systems and information from attack, be it from outsiders or from within. They may rely only secondarily on the deterrence that effective law enforcement can provide.

To provide this self-protection, organizations should focus on implementing cyber security plans addressing people, process, and technology issues. Organizations need to commit the resources to educate employees on security practices, develop thorough plans for the handling of sensitive data, records and transactions, and incorporate robust security technology such as firewalls, anti-virus software, intrusion detection tools, and authentication services throughout the organizations' computer systems.

These system protection tools—the software and hardware for defending information systems are complex and expensive to operate. To avoid hassles and expense, system manufacturers and system operators routinely leave security features “turned off,” needlessly increasing the vulnerability of the information on the systems. Industry-wide efforts are underway to address prevention, response, and cooperation. Around the world, various industries have been establishing information sharing and analysis centers (ISACs) to share real-time information related to threats, vulnerabilities, attacks, and counter measures. A recent Global Information Security Summit sponsored by the World Information Technology and Services Alliance (www.witsa.org) brought together industry, governments, and multilateral organizations across economic sectors to share information and build partnerships.

SECURITY TRAINING AND AWARENESS

The human factor is the weakest link in any information security program. It is not known who was responsible for the attacks, but officials from the government body said that emails and passwords had been stolen [5]. Communicating the importance of information security and promoting safe computing are keys in securing a company against cyber crime. Below are a few best practices:

1. Use a “passphrase” that is easy to remember e.g.—E@tUrVeggie\$ (Eat your veggies).
2. Do not share or write down any “passphrases”.
3. Communicate/educate your employees and executives on the latest cyber security threats and what they can do to help protect critical information assets.
4. Do not click on links or attachments in e-mail from untrusted sources.
5. Do not send sensitive business files to personal email addresses.
6. Have suspicious/malicious activity reported to security personnel immediately.
7. Secure all mobile devices when traveling, and report lost or stolen items to the technical support for remote kill/deactivation.
8. Educate employees about phishing attacks and how to report fraudulent activity.

CONCLUSION

The risks of cyber crime are very factual and too threatening to be ignored. Every franchisor and licensor, indeed every business owner, has to face up to their vulnerability and do something to avoid it. At the very least, every company must conduct a professional analysis of their cyber security and cyber risk; engage in a prophylactic plan to reduce the liability; assure against losses to the greatest extent possible; and implement and uphold a well-thought-out cyber policy, including crisis management in the event of a worst case scenario.

REFERENCES

- [1] <www.mcconnellinternational.com>.
- [2] Cyber Crime Laws: <<http://www.cybercrimelaw.net/Cybercrimelaw.html>>.
- [3] Windows worm numbers ‘skyrocket’: <<http://news.bbc.co.uk/2/hi/technology/7832652.stm>>.
- [4] Technical controls not enough to ensure real cyber security: <<http://www.infosecurity-us.com/view/23517/technical-controls-not-enough-to-ensure-real-cyber-security/>>.
- [5] More awareness needed: <<http://www.hostway.co.uk/news/security/more-awareness-needed-of-online-security-issues-expert-states-801268092.html>>.
- [6] Data breach costs, customer churn up a bit; Repeat offenders abound: <<http://blogs.zdnet.com/BTL/?p=12015&tag=nlrSINGLE>>.
- [7] Firm Reports Massive Data Breach from Credit, Debit Transactions: <<http://www.washingtonpost.com/wp-dyn/content/article/2009/01/20/AR2009012003674.html?hpid=news-col-blog>>.
- [8] Malicious insider attacks to rise: <<http://news.bbc.co.uk/2/hi/technology/7875904.stm>>.
- [9] Hackers warn high street chains: <<http://news.bbc.co.uk/2/hi/technology/7366995.stm>>.
- [10] “Cyber Crime is now a booming industry”: <<http://www.business-standard.com/india/news/cyber-crime-is-now-booming-industry/462549/>>.

Future Aspects of Digital Watermarking and Multimedia Security using Steganography

Ishuita Sengupta, Mragank Singhal and Deepak Sharma

CMCA, TMU

Abstract—Steganography is the art of hiding the fact that communication is taking place, by hiding information in other information. Multimedia authentication distinguishes itself from other data integrity security issues because of its unique property of content integrity in several different levels – from signal syntax levels to semantic levels. In this section, we describe several image authentication issues, a description of robust digital signature, the theoretical bound of information hiding capacity of images, an introduction of the self-authentication-and recovery image (SARI) system, and a novel technique for image/video authentication in the semantic level. The ubiquity of digital media in Internet and digital library applications has called for new methods in digital copyright protection and new measures in data security. Digital watermarking techniques have been developed to meet the needs for these growing concerns and have become an active research area.

Keywords: Steganography, Digital Signature, Digital Watermarking, Multimedia Authentication, Data Integrity.

INTRODUCTION

Image steganography techniques can be divided into two groups: those in the Image Domain and those in the Transform Domain. Image – also known as spatial – domain techniques embed messages in the intensity of the pixels directly, while for transform – also known as frequency – domain, images are first transformed and then the message is embedded in the image.

Image domain techniques encompass bit-wise methods that apply bit insertion and noise manipulation and are sometimes characterized as “simple systems”. The image formats that are most suitable for image domain steganography are lossless and the techniques are typically dependent on the image format.

Steganography in the transform domain involves the manipulation of algorithms and image transforms. These methods hide messages in more significant areas of the cover image, making it more robust. Many transform domain methods are independent of the image format and the embedded message may survive conversion between lossy and lossless compression.

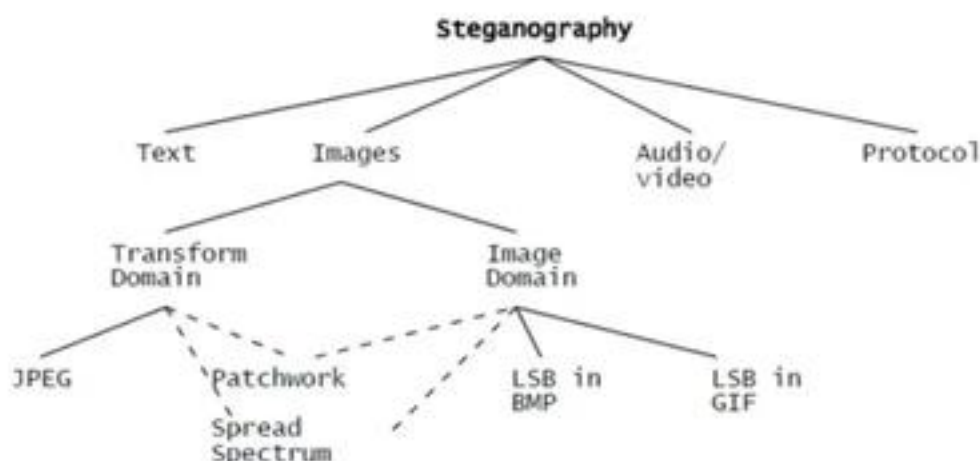


Fig. 1: Categories of Image Steganography

Digital watermark is an invisible structure to be embedded into the host media. To be effective, a watermark must be imperceptible within its host, discrete to prevent unauthorized removal, easily extracted by the owner, and robust to incidental and intentional distortions. Many watermarking techniques in images and video are proposed, mainly focusing on the invisibility of the watermark and its robustness against various signal manipulations and hostile attacks.

Multimedia authentication distinguishes itself from other data integrity security issues because of its unique property of content integrity in several different levels - from signal syntax levels to semantic levels. Content, which is an ambiguous concept, can indicate several different meanings of multimedia data. Figure 1 shows several layers of content description. Among them, the first three layers in the syntax level may be explicitly described by machines. However, an authentication system based on syntax-level modeling may meet its limits if the overall manipulation is a combination of various types of acceptable changes and the final manipulated multimedia data are still similar to the original in the semantic sense.