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CONTENTS

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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

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REFERENCES

APPENDIX/ANNEXURE

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SOCIO-ECONOMIC INFLUENCE OF SHARI'AH ON CONSUMERS' MOTIVES AND PERCEPTION IN ZAMFARA STATE, NIGERIA

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ABSTRACT

This study examines socio-economic influence of Shari'a on Muslim consumers' motives and perception in Zamfara State, Nigeria. Primary and secondary data were utilized for the study. The primary data were collected through questionnaires administered on three hundred and eighty seven respondents comprising two hundred and eighty two (282) males and one hundred and five (105) females drawn from three local government areas of Zamfara state: Tsafe (129), Bungudu (129) and Gusau (129). The multistage sampling technique involving statistical random selected process was used in selecting three villages from each local government area. Three wards were randomly selected from each LGA. Forty-three (43) households were randomly selected from the three wards in each of the three LGAs. Descriptive and inferential statistical tools were employed in the data analysis. The result of the analysis showed that positive correlation exists between socio-economic rules and regulations of Shari'a and perception ability of the consumer, and consumer motives. Shari'a as a way of life has significant relationship with consumer behaviour.

KEYWORDS
Muslims, Consumers, Shari'a, Motives, Perception, Consumer behaviour.

INTRODUCTION

Human needs motives (consumer needs) are the basis of all modern marketing. Needs are the essence of the marketing concept. Marketers do not create needs, although in some instances, they may make consumers more keenly aware of unfelt needs. Successful markets define their markets in terms of the needs they presume to satisfy, rather than in terms of the products they sell. This is a market-oriented, rather than a product-oriented approach to marketing. A marketing orientation focuses on the needs of the buyer; a production orientation focuses on the needs of the seller. The marketing concept implies that the manufacturer will make only what it knows people will buy; a production orientation implies that the manufacturer will try to sell what it decides to make.

This difference in orientation can readily be seen in Eastern Europe, where Western marketers are producing products that people want to buy, rather than "the old way" of making products and then trying to sell them. Motivation is the driving force within individuals that impels them to action. This driving force is produced by a state of tension, which exists as the result of an unfulfilled need. Individuals strive-both consciously and sub-consciously, to reduce this tension through behaviour that they anticipate will fulfil their needs and thus relieve them of the stress they felt. The specific goals they select and the patterns of action they undertake to achieve their goals are the results of individual's thinking and learning.

Religion plays a vita role in shaping the conduct of the behaviour of the people within a particular society. People's interests, needs and preferences vary among subcultures. Therefore, subculture affected consumers' motives and perception as culture does. Zamfara State has re-introduced the *Shari'a* system as a legal system and a way of life of its citizens. The state committee on Shari'a observed in its report that a Muslim must be guided naturally by *Shari'a*. However, recent adoption of *Shari'a* as a way of life in Zamfara State naturally affects all spheres of Muslim life. This, in essence, means that the processes of production and consumption are affected. In other word, *Shari'a* has an influence on socio-economic activities of the Muslims. The implication here is that re-introduction of *Shari'a* therefore has a direct bearing on consumer behaviour.

LITERATURE REVIEW

Schiffman and Kanuk (2000) admit that every individual has needs: some are innate, others are acquired. Innate needs are physiological (i.e. biogenic): they include the needs for food, for water, for air, for clothing, for shelter, and for sex which are needed to sustain biological life. The biogenic needs are considered primary needs or motives. Kotler (2000) adds that acquired needs are needs that we learn in response to our culture or environment. These may include needs for self-esteem, prestige, affection, power, and learning. It is because acquired needs are generally psychological (i.e. psychogenic), that they are considered secondary needs or motives. They result from the individual subjects psychological state and relationships with others. Abberton Associates, (1991) indicates that Goals are the sought-after results of motivated behaviour. All behaviour is goal oriented. Generic goals are the general classes or categories of goals that consumers select to fulfil their needs. Product–specific goals are the specifically branded or labeled products they select to fulfil their needs.

Motivation can be positive or negative in direction. We may feel a driving force towards some object or condition (positive), or a driving force away from some object or condition (negative). For example, a person may be impelled toward a restaurant to fulfil a hunger needs and away from motorcycle transportation to fulfil a safety needs (Bovee and Thill, 1992). Furthermore, Belk (1988) discovers that some psychologists refer to positive drives as needs, wants, or desires, and to negative drives as fears or aversions. Motivational forces seem to differ dramatically in terms of physical and emotional activities. They are basically similar in that both serve to initiate and sustain human behaviour. For this reason, researchers often refer to both kinds of drives or motive as needs, wants, and desires. Some theorists distinguish wants from needs by defining wants as product specific needs. Kotler (2000) writes that goals, too, could be positive or negative. A positive goal is one toward which behaviour is directed, and thus is often referred to as an approach object. A negative goals is one from which behaviour is directed away and thus is sometimes referred to as an avoidance object. Since both approach and avoidance goals can be considered objects of motivated behaviour, most researchers refer to both simply as goals. Brehm (1989) notes that sometimes people become motivationally aroused by a threat to or elimination of a behavioural freedom (for example, the freedom to make a product choice without undue influence from a retailer). This motivational state is called psychological reactance and is usually manifested by a negative consumer response.

Some consumer behaviourists distinguish between the so-called rational motives and emotional (or non- rational) motives. They use the term rationality in the traditional economic sense, which assumes that consumers behave rationally when they carefully consider all alternatives and choose those that give them the greatest utility. In a marketing context, the term rationality implies that consumer select goals based on totally objective criteria, such as size, weight, price, or miles per liter. Emotional motives are simply the selection of goals according to personal or subjective criteria such as the desire for individuality, pride, fear, affection and status (Kotler, 2000). However, Lewis (1991) says the assumption underlying this distinction is that subjective or emotional criteria does not maximize utility or satisfaction. Also, it is reasonable to assume that consumers always attempt to select alternatives that, in their view, tend to maximize satisfaction. Bovee and Thill (1992), observe that consumer researchers who subscribe to the positivist perspective tend to view all consumer behaviour as rationally motivated.

After having described consumer needs/motives (drivers), let us discuss consumer perception and sensation. As diverse individuals, we all tend to see the world in our own special ways. Four people can view the same event at the same time, and each will report, in total honesty, a story different from all the others.

Individuals act and react on the basis of their perceptions, not on the basis of objective reality. Thus, to the marketer, consumers' perceptions are much more important than their knowledge of objective reality. For example, if one thinks about it, it is not what actually is so, but what consumers think is so, that affects theirs actions, their buying habits, their leisure habits and so forth. And, because individuals make decisions and take actions based on what they perceive to be reality, it is important perception and its related concepts, so they can more readily determine what factors influence consumers to buy (Dudkey, 1990). Furthermore, Head (1981) puts perception stimuli into a meaningful and coherent picture of the world. A stimulus is any unit of input to any of the senses. Examples of stimulus (i.e. sensory input) include products, packages, brand names, advertisements and commercial. Sensory receptors are the human organs i.e. (the eyes, ears, nose, mouth, and skin) that receive sensory inputs. Their sensory functions are to see, hear, smell, taste, and feel. All of these functions are called into play either singly or in combination in the evaluation.

Sensation is the immediate and direct response of the sensory organs to simple stimuli (an advertisement, a package, a brand name). Human sensitivity refers to the experience of sensation. Sensitivity to stimuli varies with the quality of an individual's sensory receptors (e.g., sight or hearing) and the amount for intensity of the stimuli to which he or she is exposed. For example, a blind person my have a more highly developed sense of hearing than the average sighted person and may be able to hear sounds that the average person cannot. Smell is the sense most closely tied to memory (Giles, 1991). It has been observed by Jefkins (1990) that consumers have a number of enduring perceptions, or images that are particularly relevant to the study of consumer behaviour. He supported six consumers' perceived images. Belk (1988) says products and brands have symbolic value for individuals, who evaluate them on the basis of their consistency (i.e. congruence) with their personal pictures of themselves. Some products seem to match an individual's self-image; others do not. Consumers attempt to preserve or enhance their self – images by buying products that they believe are congruent with their self – images and by avoiding products that are not. The six classified consumers' perceived images are product and service images, perceived price, perceived quality, retail score image, manufacturer's image and brand image (Dudkey, 1990).

METHODOLOGY AND PROCEDURE

Three local government areas (LGAs) were selected in Zamfara state, namely, Gusau, Tsafe and Bungudu. Out of the total population of 2, 069,873 the three LGAs selected have 612,631 people. Following the Principle of multi-stage sampling technique, three villages were selected from each LGA. Forty-three (43) households were selected from each village making a total of 387 respondents. The number of respondents of the study was determined using the sampling method of Krejcie and Morgan in Serakan (1992).

Primary data was collected for this study. A total of 387 questionnaires were administered to ferret information pertinent to the study. The questionnaires were drawn in English language and translated in the Hausa. The questionnaires were subjected to a validation process. Copies of the questionnaires were given to a panel of experts for validation. The comments and suggestions made were utilized in restructuring the research instrument. The validation exercise ensured not only the face validity of the questionnaires but also content validity. The validation of the study instrument was necessary in order to ensure that the concepts of the study measure what it was designed to measure within the context of the study objectives. Content validity was carried out through the experts' opinions on the items. Two groups of variables, dependent and independent variables were characterized and measured through the application of nominal ratio, and likert scales.

The main purpose of this study is to investigate the socio-economic influence of *Shari'a* on Muslim consumers' motives and perception. To meet this, the study focuses on the following specific objective to:

- determine the socio-economic influence of *Shari'a* on consumer's motives and
- identify the socio-economic influence of *Shari'a* on consumer's perception.

Two groups of variables, independent and dependent variables were characterized and measured through the application of nominal ratio and Likert Scales. Independent variable(s) *Shari'a* is measured by using statement that reflect an individual attitude on influence of *Shari'a* on socio-cultural characteristics, economic characteristics and political characteristics. The influence of *Shari'a* was measured in two ways: Zamfara State pre- *Shari'a* and Zamfara State during *Shari'a*. Dependent variables are consumer's perceptions and consumer's motives. Variables under consumer's perceptions included statements on the four stages of information processing, namely exposure, attention, comprehension and retention. However, under variables on motives, the respondents were requested to indicate their level of motives on consumption of basic need in pre-*Shari'a* and during *Shari'a*. The respondents were asked to indicate their level of degree by circling only one number from 1 – 7 variables from a table combining two methods of image measurement. The variables are: very good motives, moderately good motives, slightly good motives, undecided, slightly bad motives, moderately bad motives and very bad motives. This method was adopted from combining two methods of image measurement by Mcdougall and Fry (Schiffman and Kanuk 2000).

RESULTS AND DISCUSSION

Two hypotheses were advanced and subjected to statistical analysis. The first hypothesis, which predict an association between socio-economic rules and regulations of *Shari'a* and consumer's motives, was explored using independent variables. The result is presented in Table 1.

TABLE 1: COMPARISON OF MUSLIMS CONSUMERS' MOTIVES BEFORE AND DURING *SHARI'AH.*

Study Period	Mean	Std	t-val	P val
Pre-*Shari'a*	4.70	1.54	26.98	0.0000
During *Shari'a*	6.74	0.52		

Source: Field survey, 2004

Statistically significant: ≤ 0.000

Based on the result, the hypothesis was confirmed. The results of the analysis show that positive correlation exists between *Shari'a* socio-economic rules and regulations and Muslim consumers' indicated by t value of 26.98 p ≤ 0.0000 level of significance.

The second hypothesis which predicts relationship between socio- economic rules and regulations of *Shari'a* and Muslim consumers' perception was subjected to Pearson product moment correlation analysis.

TABLE 2: PEARSON PRODUCT MOMENT CORRELATION SHOWING THE SOCIO – ECONOMIC RULES AND REGULATIONS OF *SHARI'AH* ON MUSLIM CONSUMERS' PERCEPTION

Variable	Mean	Std	R Val.	P. Val.
Consumer's Perception	8.73	.625	.112*	0.29
Shari'a	139.59	1.70		

Source: Field survey, 2004

Correlation is significant at the 0.5 level (2- tailed)

The result is presented in table 2. Based on the result, the hypothesis was confirmed. The results show that positive correlation exists between socio- economic rules and regulations of *Shari'a* and perception ability of the Muslim consumers' indicated by r-value of .112* at p ≤ 0.29 level of significant.

In testing the hypothesis, subject scores on Muslim consumers' motives before *Shari'a* was compared with the scores during *Shari'a* using t –test (comparison Method). The result as presented in table 1 showed that there is significant difference between Muslim consumers' before and during *Shari'a* (t as indicated by the p-value). We can thus infer from this result that high correlation do exist between *Shari'a* and Muslim consumers' motives. Therefore, the null hypothesis, which states that high correlation does not exist between *Shari'a* and Muslim consumers' motives is rejected and not alternate hypothesis that high correlation do exists between *Shari'a* and Muslim consumers' motives is accepted. Our result corroborate the result of Ahmad and Ansari's (1979) that the position of *Shari'a* regarding consumer and his role in the universe provides the motivating momentum, which can arouse him to act in compliance with its moral

injunctions. That is the belief in the day of judgement coupled with the divine promise of rewarding the righteous and punishing the rebellious motivates consumer to voluntarily accept Allah as His creator and to abide by the injunction of the *Shari'a* in all his consumption dealings. Another possible explanation is the view put forward by Schiffman and Kanuk (2000) that motivation is the driving force within individual that impels them to action. This driving force is produced by a state of uncomfortable tension, which exists as the result of an unsatisfied need. All individuals have needs, wants and desires. The individual's subconscious drive to reduce need- induced tension results in behaviour that consumer anticipates will satisfy needs and thus bring about a more comfortable state.

In testing the second hypothesis, respondents' composite scores on consumer perception and *Shari'a* were subjected to Pearson product moment correlation analysis. The result presented in table 2 reveals that there is a high positive correlation between consumers' perception and *Shari'a.* This result shows that *Shari'a* influence Muslim consumers' perception positively. In other words, there is a high positive relationship between *Shari'a* and Muslims consumers' perception. This finding replicate the results of Azzam (1979), which accordingly reveal that, in the context of Islamic perception, the distinction between the secular and the divine is both absurd and ineffective. The unalloyed requirement that the condition of unity between the secular and spiritual satisfied in all aspects of human activity is one of the most important determinants of consumption behaviour under *Shari'a* economic and business setting. As a result, all exploitative interests will find no place in a purely *Shari'a* consumption environment. It also agree with Schiffman and Kanuk (200) study which demonstrate that perception is the process by which individuals select, organize and interpret stimuli into a meaningful and coherent picture of the world. Perception has strategy implication for marketers, because consumers make decisions based on what they perceive, rather than on the basis of objective reality.

CONCLUSION AND RECOMMENDATIONS

The following conclusions were drawn from the analysis of the data collected and interpretation of result: *Shari'a* socio-economic has a significant influence on Muslim consumers' motives and perception. Therefore, *Shari'a* as a way of life has significant relationship with consumer behaviour, and in order to validate the finding of this study there is the need to replicate the study, in other parts of the country and to cover a large sample. The following recommendations were made in line with the findings of the study that: Marketers and policy makers should focus more on perceived risk reduction strategies in their new product promotional campaigns in a *Shari'a* socio-economic environment, marketers and policy makers should determine how specific sub-cultural memberships interact to influence the Muslims consumers' purchase decisions, and also marketers and policy makers should adopt motivational strategies in developing new ideas and product that will appeal to Muslim consumers.

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EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTION IN RELATION TO THE LEARNING OUTCOMES OF THE ENGINEERING MANAGEMENT STUDENTS OF UNIVERSITY X

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ABSTRACT

The study aims to determine the difference between the learning outcomes in traditional classroom environment compared to computer –assisted instruction environment. The research design is a quasi- experiment since two groups were evaluated, the control group and the treatment group. The participants for both groups are the different engineering students taking up engineering management subject. Both groups have the same reference book, reference materials, course content, course management and the same professor. The control group used traditional classroom environment and the treatment group used computer assisted instruction. The experimental study was done for the whole semester or 5 months. Output of this study is the learning outcomes of both groups as reflected in their quizzes, major exams, case study and final grade. SPSS was used to test the significant difference of the two groups.

KEYWORDS

computer assisted instruction, traditional classroom environment, engineering education

INTRODUCTION

Teaching could be tedious especially if there are lots of formulas to work with and computations long enough to bored both instructor and students. Recent technological developments, however, offer instructors another method of teaching which is through the use of Computer Assisted Instruction (CAI). The use of CAI is rapidly increasing and several studies have been made to evaluate its advantages and benefits. For instance, Galvis et al (2011) compared two methods in teaching Occupational Adaptation Theory: Traditional Classroom Lecture (TCL) and Computer Assisted Instruction (CAI), the results shows that the CAI group had higher learning rate as they spent 46% less time than the TCL group to cover the material but the knowledge about the theory shows no significant difference ($p<.05$) between the two groups. Likewise, the study of Clinkscale(2002) on comparing the effectiveness of computer assisted instruction as against the traditional classroom lecture in teaching algebra showed that overall there was no significant difference between the two forms of instruction. On the other hand, Bastark, R. (2005) studied the educational advantages of computer assisted instruction (CAI) in teaching statistics, a quasi experimental design was used to compare the lecture only section and the lecture-plus-computer assisted instruction (CAI) section, the result shows that participants in the lecture-plus-CAI section obtained higher averages on midterm and final exams than participants in lecture only section. Hence, the different results and views from the literature suggest a continuing research on the effectiveness of computer assisted instruction in comparison to traditional classroom lecture.

PROBLEM STATEMENT

This study seeks to answer the question: Is there a significant difference in the learning outcomes of students in a traditional classroom environment compare to students who uses computer assisted instruction?

SCOPE AND LIMITATION OF THE STUDY

The study aims to compare the two groups (i.e., the control group which uses traditional classroom set up and the treatment group which utilizes computer assisted instruction) from the period of one semester or five months in terms of their learning outcomes as reflected in their mean scores of the different assessment activities.

The use of traditional classroom environment means that the teacher uses chalk and blackboard in explaining the topics, in a classroom with no air conditioned.

The use of computer assisted instruction means that the teacher utilizes computer which served as a platform in explaining the topic. Computer-assisted instruction (CAI) "refers to instruction presented on a computer" (Encyclopedia 2011). With the use of PowerPoint Presentation, plus attractive animation, sound and demonstration discussion becomes more interactive.

METHODOLOGY

A quasi experimental design will be used in the study since two groups will be evaluated.

The subjects of this study are the engineering students who attended the course: Engineering Management in University X. During the period of study, two sections are available, one has 27 students and the other has 29 students, with a schedule of thrice a week, one hour class for both sections.

One section with 29 students will be called control group in which they will be using a traditional classroom setup all throughout the semester. The other section with 27 students will be called treatment group as they will be utilizing computer assisted instruction through the use of Instructional Technology Room (ITR) all throughout the semester. The Instructional Technology Room (ITR) is equipped with computer and LCD and a fully air conditioned room.

The two groups will be under the same teacher with the same course coverage or syllabus (i.e., Engineering Management). Both groups will have the same textbook, the same class activities and the same sets of questionnaires for the assessment period.

At the end of one semester, the proponent gathers the learning outcomes of all students for both groups as reflected with their score in major exams, quizzes and case study.

Observations and analysis of will be done for the whole semester. Descriptive statistics will be used in the study to measure the variability and central tendency of their examination scores. Two independent sample T-test will be conducted to compare if there's a significant difference between the two groups with regards to their assessment scores.

RESULTS

This section presents all data that were gathered during the course of the study. All data were presented in tables along with their interpretation. It also involves analysis of the circumstances.

TABLE 1 – DESCRIPTIVE STATISTICS – CONTROL GROUP (TRADITIONAL CLASSROOM USER / ITR NON-USER)

Learning outcomes	Minimum Score (%)	Maximum Score (%)	Mean Score (%)	Std. Deviation (%)
Preliminary Exam	50	92	77.24	8.88
Midterm Exam	58	98	88.34	8.91
Final Exam	59	90	77.52	7.14
Case Study	50	92	85.24	7.54
Quiz 1	74	80	75.90	1.45
Quiz 2	50	90	71.38	16.32
Quiz 3	50	98	80.35	12.71
Final Grade	68	90	80.35	5.47

TABLE 2 – DESCRIPTIVE STATISTICS – TREATMENT GROUP (COMPUTER ASSISTED INSTRUCTION / ITR USER)

Learning outcomes	Minimum Score (%)	Maximum Score (%)	Mean Score (%)	Std. Deviation (%)
Preliminary Exam	50	89	77.89	8.27
Midterm Exam	76	98	88.11	6.73
Final Exam	70	89	78.63	4.83
Case Study	70	95	83.15	7.49
Quiz 1	78	98	91.33	5.51
Quiz 2	50	97	73.89	12.42
Quiz 3	75	98	87.04	7.00
Final Grade	76	88	82.78	3.37

Table 1 and 2 show the learning outcomes of the control group and treatment group as reflected in their examination scores.

The major exams: preliminary exam, midterm exam and final exam are 50-item multiple choice questions, which are divided into 25 items as easy, 15 items as moderate and 10 items as difficult.

The first major exams is the preliminary covering three (3) chapters; Chapter 1 (Introduction to Engineering Management); Chapter 2 (Planning) and Chapter 3 (Organizing). The mean score for control group is 77.24% with standard deviation of 8.88% while the mean score for treatment group is 77.89% with standard deviation of 8.2%. Few students in both group got a score of 50%. On the other hand, one student in the control group got 92% which is the highest score in the preliminary exam. Looking at the mean scores as well as the standard deviation of both groups, it implies that there's no significant difference between them because the difference is very small less than 1%.

The coverage for midterm exam is also three (3) chapters; Chapter 4 (Staffing), Chapter 5 (Communication) and Chapter 6 (Motivation). Mean score for control group is 88.34% with standard deviation of 8.91% while the mean score for treatment group is 88.11 % with standard deviation of 6.73%. Students in both groups have incurred a highest score of 98%. However, in the traditional classroom environment, one student got the lowest score of 58%, whilst in the computer assisted instruction the lowest score is 76%. Moreover, all students in the treatment group which utilizes computer assisted instruction passed the midterm exam. Nonetheless, the mean score and standard deviation score for both groups reflected a little difference in score , hence it implies that overall, their midterm exam scores has no significant difference.

Final exam covers all the nine (9) chapters in the reference material of Engineering Management. Although, during the final weeks which has a duration of six(6) weeks of the whole semester, the topics discussed are ; Chapter 7 (Leading), Chapter 8 (Controlling) and Chapter 9 (Operations Management). The mean scores for both group ranges to 78% and the standard deviation has a little difference of 2%, which implies a no significant difference between their mean scores.

On the other hand, quizzes are a 25-item multiple choice exam. The first learning assessment prior to major exams is Quiz #1, the mean score for the treatment group is 91.33 % which is higher than the control group with mean score of 75.90%. Other assessment activities like Quiz # 2 and Quiz #3 implies significant *difference with regards to the* mean scores of both groups.

The mean scores of quiz 1, quiz 2, quiz 3, final quiz and final grade seems to have a large difference on their respective scores between the control group and the treatment group. To validate this claim, the proponent uses statistical treatment of two independent samples test.

TABLE 3 – COMPARING MEANS OF TWO INDEPENDENT SAMPLE TEST

	t_o	$t_{\alpha,df}$	Rejection Criterion	Conclusion
FE	0.181271	2.004881	IF $\|t_o\| > t_{\alpha,df}$	*no significant difference*
Quiz 1	3.898446			***with significant difference***
Quiz 2	0.172182			*no significant difference*
Quiz 3	0.509303			*no significant difference*
Final Grade	0.530628			*no significant difference*

Alpha ($\alpha = 0.5$)

Table 3 indicates that Quiz #1 has a significant difference between the mean score of the control group which applies the traditional classroom environment and the treatment group which utilizes computer assisted instruction. This shows that the Instructional Technology Room (ITR) users initially has a motivation to study because of the optimum environment they have experienced. Other than that, all assessment activities like all major exams and other quizzes as well as the final grade do not have a significant difference in the mean score of both groups.

CONCLUSIONS

The overall findings is that, there is no significant difference on the learning outcomes as reflected by the mean score from the different assessment activities of both the control group which applies the traditional classroom set up and the treatment group which utilizes computer assisted instruction. Signifying the course management and the teacher are still the main player in influencing the learning outcomes of the students. The only exception to this is Quiz # 1 , which after statistical treatment yields a significant difference on their mean score. The treatment group got a higher mean score of 91.33 % as compare to the mean score of the control group which is 75.89%. This suggests that the use of CAI increases the motivation of the students to study and learn more. Furthermore, it implies that the improvement of facilities of University X were helpful in upgrading the learning outcomes of the students by means of communicating effectively the topics.

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IDENTIFYING TECHNOLOGICAL PARAMETERS EFFECTIVE ON COMPETITIVENESS OF SMALL AND MEDIUM-SIZED RESIN COMPANIES ACCORDING TO UNIDO MODEL: CASE STUDY OF IRAN KEATON POLYESTER MANUFACTURING COMPANY

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ABSTRACT

Survival in the global competitive markets is among the most challenging aspects of business in the today's world. Changing customer needs makes them to consider competition parameters such as price, quality, delivery time, etc., to outrun their rival companies. One of these parameters, one with priority in resin industry, is quality of the products. In addition, technological advances can boost competitive advantages due to its impact on the quality of the products. There are some constraints acting upon the advancement in technology, which includes time and space for small businesses. Thus, there will be a need to a strategy for companies to identify the key technological advances that they want to improve. One of the important tools in building technological strategy is CAPTECH model, introduced by United Nations Industrial Development Organization (UNIDO), which is crucial in detecting the technological needs and gaps effective on competitive factors. From a CAPTECH point of view, technological parameters include operational infrastructures, product technology, process technology, skill and knowledge platforms, procedures and systems, informational support, and optimization and logistics. Technology parameters are indicative of that level of technology with fundamental role in developing a competitive advantage for companies. To assess the technology, we are to assess its parameters. These parameters, for their direct impact on factors of competition, are important. Therefore, the problem to which the present paper seeks an answer is that 'what are the technological parameters having impact on the competitiveness of Iran Keaton Polyester Manufacturing Company?'

KEYWORDS
technology, technology assessment, technology strategy, competitiveness, CAPTECH methodology.

INTRODUCTION

The more crucial a technology in producing a competitive advantage in a business, the more important its development in business will be. If a technology is not pivotal in boosting the competitiveness and advantage, its development necessitates no priority for a company, and so, it will not be enough fuss over that in the company. Prioritizing and planning for the development of a technology should be proportionate to its role and weight in producing competitive power for an industrial complex. Only after this will the technological development lead to improved productivity and increased production in a given business and possibility of increased allocation of resources for next level of technological developments (Jafarnezhad, 1999).

Applying changes into the current level of technology to next optimum level requires clear objectives of changes, specific strategies, and accurate management of them. The path to gaining access to new technologies in a company directs to management of applying changes to technology. Only this path leads to improved level of technology. However, technological changes and its improved level, prima facie, is not a valuable thing, but its importance emanates from improved competitive advantages achieved in this way by the companies (Renasi et al, 2010).

Identifying the parameters of technological change and developing a technological strategy in a business lead to competitive advantage and technological innovation of a kind and benefit via grasping the opportunities for technological changes. This is an example of technological entrepreneurship.

In the present study, first a literature review of the subject is presented. Then, methods of research are introduced and, in the end, the findings of the study are given.

REVIEW OF LITERATURE

Chun and Chun (2000) introduced an algorithm for determining the quantity of tangible and intangible advantages in a fuzzy environment. They propounded the application of fuzzy theories in hierarchical structural analysis. From an analytical perspective, the decision-makers are asked to estimate their opinions on the relative importance of diverse factors qualitatively and not merely in numerical values. The descriptive and linguistic variables fall in a continuum of extreme, very high, moderate and low that are converted to fuzzy numbers, because assigning a number to a spectrum of items indicates much quality about items. Adding the hierarchy gives preferred weight of any technology, which is called fuzzy proportion parameter. This parameter for each technology is categorized

and then preferred category of each technology is determined. From an economic assessment perspective, an analysis of a fuzzy liquidity is applicable here. Due to some uncertainties imbedded in the economic analysis of engineering prevalent on the prediction of future of liquidities and because liquidity is defined as a complex series of numbers and probability distribution, the outcome of the analyses may suffer ambiguities. To establish a quantitative relationship between uncertainty and indefiniteness, a model of trigonometric fuzzy numbers, each vertex of the triangle denoting the most probability value, most pessimistic value, and most optimistic value denote liquidity. With this algorithm, the ambiguity imbedded in the evaluation of data is determined effectively and for the sake of certainty, it can be processed for arriving at an effective and convincing decision-making (Journal of Materials Processing Technology, 107: 2000). Law, Ridgway, and Atkinson (2000) introduced a tool developed from the techniques of application of quality functions. This tool facilitates the rapid evaluation of the possibility of thixoforming process in manufacture of products. Newer technology are developed in order to be exploited by companies in their decision making and convert their limited resources to maximum competitive advantage, though a holistic evaluation of the technology requires long hours and high costs (Lowe, Ridgway and Atkinson, 2000). Multimatrix analysis tool is developed using QFD techniques and is applied to evaluate the potential products in innovative metal molding methods. This tool is not a surrogate for comprehensive economic analyses. The level of activity in allocation of the material, the importance of weighting and relationship are also important, without which the tool may suffer precision and accuracy. According to the findings of Lowe, Ridgway, and Atkinson (2000), this tool is applicable in evaluation of innovative technology. For example, high-speed mechanization enjoys advantages (such as high-speed production cycle) and suffers downsides (such as high costs of machinery and providing tool for industry) according to which tool can be evaluated Vis-a- Vis related properties of the products (such as material, geometry, and machinability).

Amy H.I. Lee,Wei-Ming Wang,Tsai-Ying Lin (2010) noted that in order to keep up with the pace of competition in global competitive markets, companies should always develop their new technologies in order to have the upper hand. Gaining new and essential technology, especially those applied in production of advanced products, is important. The technical knowledge of the use of technology should be transferred from suppliers to engineers and contractors of the company to be used effectively. In their study, Lee et al (2010) expounded the technological transferring and developing a comprehensive framework to evaluate and choose from new technologies and machinery. The key factors effective on newer technology transfer for the first time were collected via a literature review of the subject and interviews with experts in Taiwan Transistor and Thin Layer Liquid Chrystal Displayer Industry (TFT-LCD). Fuzzy Delphi Method (FDM) is applied to choose the most crucial factors. Later, planning and interpretive structural modelling (ISM) was applied to determine the internal relationship between main components. A fuzzy analysis network processing (FANP) is developed to evaluate the performance of suppliers of technology transferring provisions. The findings of Lee et al (2010) provided a firm base for companies to evaluate the purchase of new equipment. They also functions as a reference tool for suppliers of this equipment to improve the quality of technology transfer to customers (Amy H.I. Lee, Wei-Ming Wang,Tsai-Ying Lin,2010). In their study, Trail and Silva (1996) highlighted the importance of use of standard parameters in estimating the competitiveness of companies and deemed it the main component of examination of competitive advantage. The notion of global competition is fundamentally based on trade. They also indicated that goods produced solely for global markets should be evaluated on a scale proper for measuring the global competition. Due to the special attention lavished to the internal and external content of these products, diverse forms of traditional trade exchanges are criticised. An experiment carried out on the food industries of France, Germany, Italy, and Britain, indicated that, reformed parameters are essentially different from traditional parameters. During this experiment, the competitive advantage is credited as a dynamic concept, which should not be viewed from a traditional perspective. In respect to foreign products, multi-national companies should be depicted by the same definitions. The current vogue of traditional trade based on diverse aspects is indicative of fundamental differences in the level of aspects under study and also, and most importantly, in trade level. For example, UK food industries are not competitive enough due to shortages and disorders in trade. Considered collectively, the performance of companies producing food items, it has been competitive. Among the disadvantages of the experiment above, was the fact that the sources of competitive advantage of food industries is not mentioned, so there is no strategy for improves in competitiveness of the companies mentioned in the experiment. The emphasis upon the updating the measures of evaluation of food industry is put in order to survive in the global competitive markets, to which no strategy is provided. The importance of choosing a proper parameter to analyse how and when a company enters competition is the most valuable part of the study above.

Rivard et al. (2006) believed that the share of information technology in business could be assessed from two perspectives: strategic situationism that lends much importance upon the market forces, and a view of the situations, which assumes company the core of the studies carried out. They contributed to understanding of the share of information technology in firms' performance playing a complementary role between two perspectives. Sponis (2001) endorsed the Porter's competition framework as a legitimate one. He investigated the salubrious effects of information technology through setting business strategies and through the effect of company's assets on its performance. Reeda et al. (2000) believed that although management of quality can produce competitive advantage, it is interesting enough to mention the fact that not a single theory exists about it or little research has confirmed this belief. So Reeda et al., (2000) is an attempt to credit this claim. With the application, formulation, and putting confidence in theories of market-based competitive advantage, firm-based and system theories, they concluded that the so-called undocumented theory could be confirmed. They also found that the components of total quality management (TQM) are able to produce cost-based or distinction-oriented advantage, and that it can bring about an innate indirectness and complexity to the TQM process. TQM has the potentials of barring the imitation of the system by the rival companies, a quality that is crucial to the sustainability of the firm. The most vital part of the study by Reeda et al. (2000) was to account for the relationship between TQM and sustained competitive advantage, and to determine the issue that, from a theoretical perspective, is the hypothesis that strategy is able to produce sustainable advantage verifiable. Having reviewed the literature of the subject, they present arguments that show how a TQM produces cost-based or distinction-oriented advantage. The research, among others, by Powell (1995), Flym et al. (1955) indicate the possibility of a link, but for the sake of certainty, the hypothesis that TQM can produce cost-based, and/or distinction-oriented advantage, should be verified by an approach that investigates the things in more detail. There is also a need to practical research on the sustainability of the TQM-based advantage.

Nasierowski (1991) put emphasis on the outstanding innovations and soaring product quality among the technological advances of Mexican companies. His research is a quantitative and qualitative. He investigated the fundamental components of technological advances, the pace of accord, the level of skills and unified plans, two theories of business process reconstructed (BPR) and total quality management in Mexican environments. He observed that whenever plans are implemented with the purpose of increase in quality and executive components of technology in Mexico, trouble should be expected. The issues in Mexican industries are a relatively low level of technology and quality. Beyond a planned programming, a need to cultural conditions specific to the situation in order for TQM and BPR to succeed. The reforms in these theories are necessary before being used in Mexican environments, since they differ in terms of their theoretical undergirds. TQM and BPR should be considered as theories helpful in technological and quality reconstruction. They suggest different formulations and conflicting solutions:

Rearing versus Education; permanent recruiting versus recruiting in times of need; collective effort versus smoothing hard work; specialization versus eclecticism; more control versus decreasing control bottlenecks; cycling work hours versus emphasis upon productivity; reimbursements based on seniority versus reimbursements based on the results of the activity. In whole, although these methods propose common solutions, for example, staff, power transfer, a change of values from protectionism to productivity, managers as mentors, more level organizational structures, directors' board versus the inspector's guide etc., and these theories can function complementary to other theories.

In his study, Sultan (2007) investigated the four factors of effective agents, demand situations, related industries and company's strategy and competitiveness and structure of the company, drawing upon Kaplan model as his base of study. He indicated that, with the emergence of modern economy in the world, the impact of information technology and communications as venues to success are agreed upon. The impact of IT can be traced in its role in different aspects of competitive advantage including time, cost, and flexibility. Competitive advantage framework used by Sultan (2007) consists of concepts of foreign macro-environment, Porter's five factors, and the chain of value, strategy, competitive advantage, and ICT. In his research, the government is credited with being the agency of providing the condition conducive to gaining access to better technology, because the government should regulate the business environment to have the potential of receiving ICT. Among the roles assigned to government, are well-objected plans to eliminate the market disorders, effective policies in ICT use including developing and improving the legal and infrastructural networks and environment, increasing technologic depth and providing a favorite business

environment. Companies active in developing countries need to have knowledge of when and to what extent they are to use technology. Some restrictions on the way of using superior technology of IT are higher costs of Internet, linguistic problems, and a lack of understanding of techniques of electronic trade and technology necessary to perform that. Sultan (2007) then examined some factors in small- and medium-sized companies in production line and proposes some guidelines to improve the technology level in these companies. He used factors in diamond model and five factors in Porter competitive advantage framework. His results from SWOT included updating and simplifying the laws and regulations, updating organizational structures, boosting entrepreneurship and staff conditions, developing organizations to sponsor small and medium-sized companies, improving the active cluster of a core unit, and enhancing the technological potentials of the companies. His method included both qualitative and quantitative ones and the sampling was carried out randomly. He divided his sample population to 3 categories according to different geographical conditions. Then he carried out a random sampling in each category. In Italy, Turkey, and Jordan, he used questionnaires to collect data. He proposed four approaches for measuring the competitiveness of a company, which included survival, organization, simple auditing measures, and comparative auditing measures.

A study by Savioz and Blum (2002) is an attempt to propose a modern notion as an opportunity perspective, which suggests collection of data related to technology in decision-making about the future changes. It case-studied a company in Switzerland and indicated that by managing the knowledge and collecting data related to technology, managers can succeed to make decisions on technological changes in complex environments. Ellen and Moors (2005) argued for the technological strategies leading to fundamental innovations in the industry of aluminum manufacturing. They developed a concept to analyze the technological strategies in Netherland and Norway, which provides tools for technological policies in order to produce sustainable businesses. Overall, they suggested that access to technology and research networks, different domains of knowledge, adapting to future environmental events are effective factors on technological strategy. Francis C.spital, Deborah J.Bickfor (1992) investigated 120 business units to find a relationship between the success of these businesses in dynamic environments and technological and competitive strategies applied to products. In these businesses, the strategies leading to success are as follows:

1. Innovations in products of higher technology;
2. Different services for products of lower technology;
3. Strategies of handling costs in products of lower technology;
4. Strategy to focus in dynamic environments.

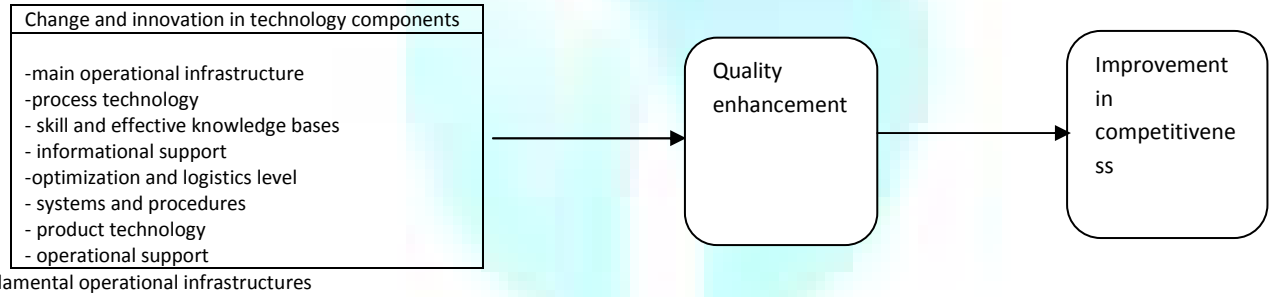
He indicated that there is a powerful link between technological strategies and success in business.

Lucas (1994) presented a model based on successful business, which stated that the market needs necessitates advances in technology and this in turn, makes companies to adopt their proper market strategies. Technology in access improves the power to design better products and so it is effective on attaining market objectives.

THEORETICAL FRAMEWORK

There are many theoretical frameworks of definition of technology and its components. The present study is based on the standard model of detection of technological needs of UNIDO (CAPTECH). This model presents an applied framework to evaluate the technological needs of industry and has eight components given below. The model was developed in 2000 and Hejazi explained definitions and methodology, Binesh and Renasi in their book entitled *Evaluation of Technology in Small- and Medium-sized Companies* (2009). As seen in the model below, any change in any technological component can wield impact on the enhancement of competitive quality of business. However, due to constraints in resources, technological quality priorities should be specified and evaluated. The priority is set based on the maximum weakness in the component and maximum impact on the quality enhancement. This leads to technological entrepreneurship because of change in any components of technology.

FIGURE 2.2: CAPTECH MODEL FOR COMPETITIVE QUALITY



Fundamental operational infrastructures

Quality factors in operational infrastructure component include aspects of certainty to answer the following questions:

- The equipment and infrastructure making an industry should have maximum accord with the capacity and the sort of goods produced;
- The criterion should be the performance of machinery and equipment;
- The machinery should be evaluated in terms of its performance in control of important quality parameters.

PRODUCT TECHNOLOGY

Product technology applied to compare the level of technology used in manufacturing the product in the world, in quality phase, denotes the comparison of the level of design of the product to the best in its kind.

Evaluation tables in this stage of the study according to priority included the following: out-dated designing technology (poor product), product with preliminary design, and products with good primary design and tested in the laboratory, and most sophisticated product with most complete design. The acceptance of any product should be carried out according to criteria set by the quality control unit. For each step of product manufacture, plans should be set. Designs should be approved and controlled. Controlled properties of the product should be included in designing. Quality of product after every step, any technical change or after any new activity or process should be controlled.

PROCESS TECHNOLOGY

Process technology is a level of technology according to which processes are executed and is an indication of the level of effectiveness of process to meet design demands. Scoring the processes includes according to priority the following: traditional processes without documentation, documented processes, processes of how technologies, what technologies, permanently controlled processes, advanced processes with real-time controls. The questions should be posed about the use of control sheets, Parreto histogram, and methods of controlling of automatic processes. Methods of rapid recognition of the product disproportionate to primary design would increase the points of the process.

SKILL AND KNOWLEDGE BASES

It denotes the level of skill and performance of the staff members. Education, experiences, knowledge, and capability of the staff are only possible through investigating of their profiles. Their competence to handle modern technology and new tools relevant to their field of expertise, their familiarity with product and drawbacks of quality defects, the proportion of the number and competence of staff members in any stage and their activity signifies the points of the process.

SYSTEMS AND PROCEDURES

This component, in practice, functions as factor of certainty to accurate execution of necessary processes. This includes different stages of archiving and documenting systems, storing, the reserve, and systems of quality control. The existence of any system and procedure and their application are evaluated through the following:

- The existence of a logical and executive organizational echelon in the company;
- Codified sheet of tasks
- Quality regulatory measures
- Procedures necessary to ensuring the accordance of tasks and responsibilities
- Documentations relevant to quality of designs
- Definition of quality control in any stage (documentations necessary to produce and preserve quality including charts, executive methods, guidelines, inspection limits, and decision-making laws.)
- Recording the errors and problems occurred in the quality system;
- A logical trend to achieve the level of relevance of the product and needs of the design according to customers' needs;
- A trend in organization to issue and move documents; preserving and updating documents of definitions; tracing of the product in different stages of production; of handling the daily stuff, of controlling machinery and equipment and repairs; of ISO9000 system to control secondary contractors periods; of trends of sampling and giving results; quality and quantity control in different stages of company activity; and documentation of defects and reports to eliminate them.

INFORMATIONAL SUPPORT

It means the ability to convert data to practical and purposeful information to accelerate the management reactions and problem solving. Its evaluation in the competitive quality phase is carried out in the followings:

- Collection and recording of data in any stage, external data related to rival companies and market and other sectors;
- The ability to convert recorded data to information
- Evaluation of system of formal reporting in organization to inform the managing board about the different sections and problems and current performance;
- The level of awareness of managing board about the current problems;
- The ability to analyze problems, predicts possible defects and designing product, causal relationship tables and methods of problem solving and the method of distributing of information to related sections in the organization;

OPTIMIZATION AND SUPPORT

Support functions as a mechanism of accelerating the activities and facilitating practices and consists of followings:
Written standard activities, work systems, discipline and appearance, proactive keeping practices, use of jigs and fixtures, guidelines for flawless doing things, regulations, primary inspections, tools of material use, identification labels, cards of history of formats and identification labels. Optimization consists of the knowledge of using best practices and technologies. Its evaluation is carried out through the followings: production basket with balance of produced items, the decrease in diversity of products, control of current assets, design of working stations and assembly lines. In the domain of quality, optimization is estimated through the followings: a written standard procedure for any activity. It includes executive steps, definition of responsibilities in a reasonable working system, a series of working regulations, internal control of practices, using PM systems (proactive measures), using fixtures and guides and controlling their accuracy, materials to identify the product, including labeling sheets, and control and upkeep of equipment (Hejazi et al, 2009).

METHODOLOGY

In this study, first, using a literature of the subject including competitiveness in business, factors effective on it, show technology as the key factor in enhancement of competitiveness and strategy needed to achieve that. Before interview and primary investigations, the company is asked to give a list of its needs in written form. So, the first stage is to send a standard letter and then an appointment with company managers to explain the needs of the researcher and the objectives of the study. Then, an investigation of explicit documents and processes of the company is carried out. Because the competition factor under study is specified, the evaluation of competitive factors and setting priority on them is not the subject of the present study. To specify the quality standards is part of the objective of the study, which provides a background to achieve favorite results. Meeting and interviewing with staffs and managers of the company are carried out using constructed questionnaires. This is carried out with the aim of identifying the different operational phases. All the staff in operational lines is interviewed. Next, interview and visit all the input lines of organization are carried out.
The study population executives and line managers, the company produces polyester resins industry in Iran is Keaton. The factory and the headquarters of the questions we cover.
The case study is the investigation of the samples is determined. Participants in the interviews included senior managers and experts from different units is saturated in the quality of data used.
The coding method was used to determine the components comprising the following steps:
- Overview of articles and how they are segmented
- Select the number of data and their
- Merge the code in the main categories of information
- Reduce duplication and identify those issues with the removal of the major categories
- Into the main categories

DISCUSSION AND CONCLUSION

This paper is an attempt to technological parameters influencing the quality of the competition. Selected technological parameters of the standard model are Captech UNIDO. The qualitative interviews conducted in three phases and during the third stage. The first phase consists of related literature was reviewed to identify indicators of quality in the industry. In the second phase of interviews for understanding processes affecting the quality of our work is done. The qualitative part of the third phase, the parameters of the technology platform to identify different standard was based on indices. In the next section to identify, the indicators and the coding parameters in each stage of the technology were according to their backgrounds.

RESULTS OF SECOND PHASE OF INTERVIEWS

TABLE 1.4: IDENTIFYING THE FACTORS AFFECTIVE ON THE COMPETITIVE QUALITY, FIRST STEP

First step: raw material provision
This stage includes the purchase of raw material in powder and liquid forms from petrochemical companies. The high quality material is often imported from Netherland. Some companies with long history of imports of raw material of fiber glass, are direct importers of polyester resins and diverse forms of glass fibers and other composites from famous manufacturing companies in Turkey, Taiwan, South Korea , China, etc.

TABLE 2.4: IDENTIFYING THE WORKING STAGES EFFECTIVE ON THE COMPETITIVE QUALITY, SECOND PHASE

Second stage: quality control
The purchased material should have necessary standards. The level of acidity should be between 800 and 1200. If not meeting the standards, material is turned back to reservoir.

TABLE 3.4: IDENTIFYING THE WORKING STAGES EFFECTIVE ON THE COMPETITIVE QUALITY, THIRD PHASE

Third stage: production
First, the melted material is poured from a lifting machine via a funnel-shaped apparatus into a reactor (a reservoir of 10 meters high and 8 tonnes of weight). Then hot oil inside the zigzag tubes surrounding the reactor add to the temperature up to 100 degrees centigrade for the initiation of the process. A mixing shaft with 3 blades moving in all the length of the reservoir mixes the material. However, the temperature should be raised gradually to 240 or 240 degrees centigrade. Care should be taken that the increase of 10 to 20 degrees is gradual. since it plays a crucial role in this stage of the operation, which needs a gradual rise in temperature.

TABLE 4.4: IDENTIFYING THE WORK STAGES EFFECTIVE ON THE COMPETITIVE QUALITY, FOURTH STEP

Fourth stage: dehydrating
The water content of the mixture is separated via a container in the underside of the reservoir. This water darkens the resin. Dehydration is carried out through mixture as vaporization and then through liquidation is reserved in other container. In this stage, the mixture should release 500 kg of water. The more the release of water, the more the temperature will increase and that is effective on the production time.

TABLE 4.5: IDENTIFYING THE WORK STAGES EFFECTIVE ON THE COMPETITIVE QUALITY, FIFTH STEP

The fifth stage: experiment
A sample of mixture from the faucet of sampling is carried out. This sample of resin should be acidic, having the acidic number of 20 to 22, and usually this number is even more, up to 40 to 50. Due to high temperature, if the acidic number is low, ester becomes jellified. With increasing temperature and simultaneous sampling, the acidity number lowers to favorite value from 60 to 50 and even to lower values.

TABLE 4.6: IDENTIFYING THE WORK STAGES EFFECTIVE ON THE COMPETITIVE QUALITY, SIXTH STEP

Sixth stage: cooling
This phase is similar to warming described above using hot tubes containing hot oil. Through this operation, temperature decreases from 240 to 150. In the end of this operation, raw resin is called ester.

TABLE 4.7: IDENTIFYING THE WORK STAGES EFFECTIVE ON THE COMPETITIVE QUALITY, SEVENTH STEP

Seventh stage: feeding or combining
A device called blender is installed under the reservoir, which is about one and half time greater than reactor reservoir. It is filled with stiring that combines with the ester inside to give the final product of resin. The stiring needed with temperature of 40 degrees centigrade is poured into blender and when its temperature rises to 50, the faucet of the reactor reservoir is opened and it is added to blender content. It is called feeding. This should be done step by step. A large thermometer is located in the process to control the temperature during the feeding process and keep it no more than 60 degrees. The whole content of the reservoir reactor should combine with that of the blender. The final phase of experiment 1. The acidity of ester is 10 units less than that of final product, e.g., it lowers from 30 to 20. 2. Viscometer measures the viscosity and the concentration of the resin. 3. The color achieved for the resin is also compared. It should be white, yellow or milky white, and should not be dark, which is indicative of high temperature and burning. It may be blue, which may indicate the burned resin inside.

TABLE 4.8: IDENTIFYING THE WORK STAGES EFFECTIVE ON THE COMPETITIVE QUALITY, EIGHTH STEP

Eighth stage: releasing
If meet the above standards, resin is released out of the reservoir reactor in gallons. Under the reactor, a scale is installed in order to measure the gallons weight as 200 kg. after release, the gallons are transported to depository. The temperature in depository should be cool enough for resin to remain in gelatin form. The life of the resin is about a year and it is stored in 25 degrees.

1.1.1. The results of the third phase of first interview

TABLE 4.9: THE TECHNOLOGICAL PARAMETERS EFFECTIVE ON THE COMPETITIVE QUALITY

Number	Technological parameters	
1	Basic operations	Precision in size, proportion of the equipment to capacity and the kind of production, investigation of insurability of the quality and its important components
2	Product technology	Conformity of the product and the qualitative measures, designs for different stages of production, the level of engagement of control properties in designing, quality assurance after any new activity or reconsideration of the production
3	Process technology	Use of automatic process control, proportion of process and primary design of the product, use of proper methods of quality assurance parameters which are controlled during the process, such as PEMEA and DOE
4	Skills and knowledge bases	The level of skill and knowledge of staff, their competence in using modern tools to improve the quality of the product, their ability to use statistical techniques, the level of their familiarity with drawbacks arising from quality defects, the proportion of number and qualification of the staff with their work.
5	Systems and procedures	A logical and executive organizational echelon, codified tasks sheets, quality disciplines and following them, documentation of quality planning, definition of quality control system for any working stage, the possibility of investigating errors in quality system, a codified procedure to proportion of design needs and customer needs, codified rules to update documentations, tracing products and control in any stage, periodic evaluation possibility, codified regulations to ensure the quality and quantity control
6	Informational support	Collection and recording of data in any stage, external data related to rival companies and market and other sectors; The ability to convert recorded data to information Evaluation of system of formal reporting in organization to inform the managing board about the different sections and problems and current performance; The level of awareness of managing board about the current problems;
7	Optimization and support	Written standard activities, work systems, discipline and appearance, proactive keeping practices, use of jigs and fixtures, guidelines for flawless doing things, regulations, primary inspections, tools of material use, identification labels, cards of history of formats and identification labels. Optimization consists of the knowledge of using best practices and technologies. Its evaluation is carried out through the followings: production basket with balance of produced items, the decrease in diversity of products, control of current assets, design of working stations and assembly lines.

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IMPACT OF ISLAMIC BUSINESS ETHICS ON FAMILY CONSUMPTION DECISION MAKING IN ZAMFARA STATE, NIGERIA

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ABSTRACT

The study examines the relationship between Islamic business ethics and family consumption decision making in Zamfara State. The primary data were collected through questionnaires administered on three hundred and eighty seven respondents comprising two hundred and eighty two (282) male and one hundred and five (105) female drawn from three local government areas of Zamfara State; Tsafe (129), Bungudu (129) and Gusau (129). The multi-stage sampling technique involving statistical random selection process was used in selecting three villages from each local government areas. Three wards were randomly selected from each local government areas. Forty-three (43) households were randomly selected from the three wards in each of the three local government areas. Descriptive and inferential statistical tools were employed in the data analysis. The result of the analysis shows that Islamic business ethics and family consumption decision making has a prominent relationship.

KEYWORDS

Islamic, Business Ethics, Family, Consumption, Decision-Making, Zamfara.

INTRODUCTION

Islamic business ethics may be defined as the set of moral principles that distinguish what is right from what is wrong in business practices. It is a normative field because it prescribes what one should do or abstain from doing. Islamic business ethics, sometimes referred to as Islamic management ethics or Islamic organizational ethics, simply limits its frame of reference to organizations. What is considered Islamic business ethical behaviour may depend on the factors that define and affect business ethical behaviour. These factors are legal interpretation, organizational factors, individual factors such as stages of moral development, personal values and personality, family influence, peer influences, life experience, and situational factors.

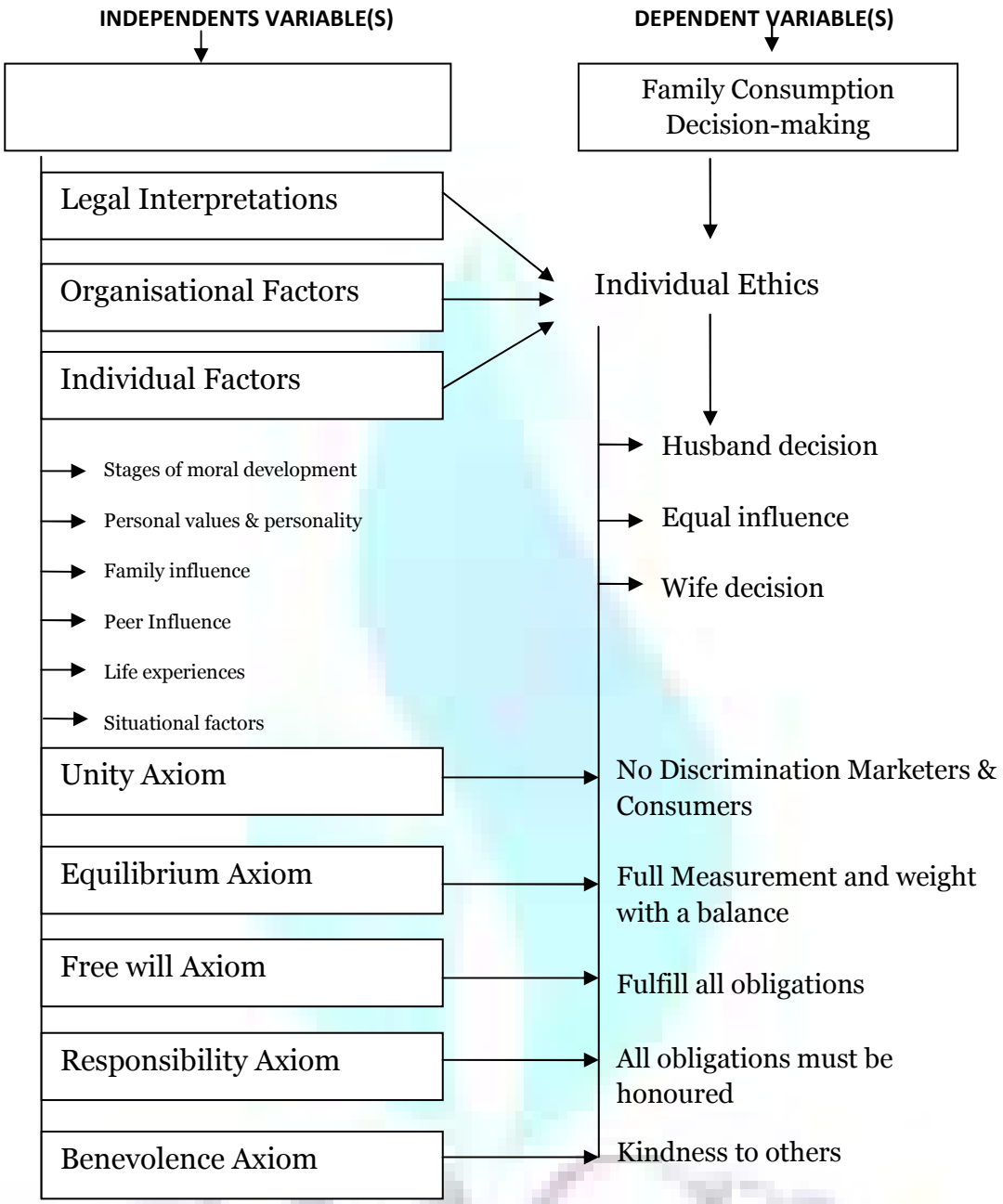
Family consumption decision making in Islam rests firmly on four basic hypotheses: Consumption decision making is indissolubly linked, through unity, with man's ethical environment; by virtue of the basic quality of equilibrium, there must obtain a just balance among the basic production, consumption and distribution relationships; Free will, translated onto the business space, require that Muslim consumer's freedom and state control be suitably combined to reflect the distinctive Islamic concept of human freedom and the axiom of responsibility dictates a conscious policies of redistribution and resource transfers among various classes and groups of the society. This paper spells out these hypotheses and their logical. Consequences for the distinctive type of family consumption decision making required of the Muslim family consumer behaviour according to Islamic business ethics. This paper also takes a brooder perspective and examines family consumer decision making in the context of all types of consumption choices, ranging from the consumption of new products to the use of old and established products. Also, it considers family consumers decisions not as the end point, but rather as the beginning point of a consumption process.

OBJECTIVE OF THE STUDY

The study examines the relationship between Islamic business ethics and family consumption decision making in Zamfara State, Nigeria.

THEORETICAL/CONCEPTUAL FRAMEWORK

FIGURE 1: MODEL OF IMPACT OF ISLAMIC BUSINESS ETHICS ON FAMILY CONSUMPTION DECISION-MAKING



Source: Bala (2009)

METHODOLOGY

INSTRUMENT

A total of 387 questionnaires were administered to collect information pertinent to the study. The questionnaires were drawn in English language and were translated in Hausa. The questionnaires were subjected to a validation process. Copies of the questionnaires were given to a panel to experts for validation. The experts were from the Departments of Economics, Political Science and Sociology, Usmanu Danfodiyo University, Sokoto. Also, two additional experts from the Department of English, Polytechnic, B/Kebbi and one experts in *Shari'ah* Law. The comments and suggestions made were utilized in restructuring the research instrument. The validation exercise ensure not only the face validity of the questionnaire but also its content validity. The validation of the research instrument is necessary in order to ensure that; the concepts of the study it measured what it was designed to measure within the context of the research objectives. Two groups of variables, dependent and independent variables were characterized and measured through the application of nominal, ratio, and likert scales.

SAMPLING PROCEDURE

The primary data were collected through questionnaires administered on three hundred and eighty seven respondents comprising two hundred and eighty two (282) male and one hundred and five (105) female drawn from three local government areas of Zamfara State; Tsafe (129), Bungudu (129) and Gusau (129). The multi-stage sampling technique involving statistical random selection process was used in selecting three villages from each local government areas. Three wards were randomly selected from each local government areas, forty-three (43) households were randomly selected from the three wards in each of three local government areas.

RESULTS AND DISCUSSIONS

The data in table 1 showed that husband level of participation of family on consumption decisions making before the re-introduction of *Shari'ah* scored high at 55.8 percent while during the re-introduction of *Shari'ah* it scored very high at 68.8 percent. Table 1 also revealed that both husband's and wife's equal influence on consumption decisions making before the re-introduction of *Shari'ah* scored high at 47.9 percent while during the re-introduction of *Shari'ah* it was

very high at 82.7 percent. With regards to wife's level of participation in consumption decision making before the re-introduction ion of *Shari'ah* scored high 47.4 percent while during the re-introduction of *Shari'ah* it scored very high at 60.5 percent. These results obtained in this study confirm the work of Schiffmana and Kanuk (2000) found that the family is a major influence on the consumption behaviour of its members: it is also the prime target market for most products and product categories.

TABLE 1: PERCENTAGE DISTRIBUTION SCORE ON MUSLIM FAMILY CONSUMPTION DECISION

No.	Items	Very High	High	Average	Low	Very low	Total
1	Husband decides before the re-introduction of *Shari'ah*	15 (3.9)	216 (55.8)	142 (36.6)	14 (3.7)	- -	387 100
2	Equal influence (Husband and Wife) before the re-introduction of *Shari'ah*	5 (1.3)	185 (47.9)	176 (45.3)	19 (5)	2 5	387 100
3	Wife decides before the re-introduction of *Shari'ah*	5 (1.3)	184 (47.4)	159 (41.1)	34 (8.9)	5 (1.3)	387 100
4	Husband decides during the re-introduction of *Shari'ah*	266 (68.8)	115 (28.6)	6 (1.6)	- -	- -	387 100
5	Equal influence (Husband and wife) during the re-introduction of *Shari'ah*	319 (82.7)	56 (14.1)	3 (.8)	9 (2.4)	- -	387 100
6	Wife decides during the re-introduction of *Shari'ah*	234 (60.5)	132 (34)	12 (2.4)	9 (3.1)	- -	387 100

Source: Field Survey 2009

Note % is in parenthesis

TABLE 2: T-TEST COMPARISON OF MUSLIM FAMILY CONSUMPTION DECISIONS DURING *SHARI'AH*

Variable(s)	N	Mean	Std Dev	df	r-val	Pval
Before *Shari'ah*	387	10.43	1.70	381		
					42.93	0.000
During *Shari'ah*	387	13.97	1.38	381		

Source: Field Survey, 2009

Statistically significant; $p<0.0000$

HYPOTHESIS

Ho : Islamic Business Ethics have no significant impact on Muslim Family consumption decision-making.

Hi : Islamic Business Ethics have significant impact on Muslim family consumption decision-making.

One hypothesis only was advanced and subjected to statistical analysis. The hypothesis, which predicted that Islamic business ethics have no significant impact on Muslim family consumption decision making, was subjected to t-test comparison. The result is presented in Table 2. In testing this hypothesis, subject scores on Muslim family consumption decisions before *Shari'ah* was compared with their scores during *Shari'ah* using t-test (comparison method). The result presented in table 2 showed that there is significant difference on Islamic business ethical issues between Muslim family consumption decisions before and during *Shari'ah* [$t(381)=42.93; p \leq 0.000$]. Based on the result, the hypothesis was confirmed that Islamic business ethics have impact on Muslim family consumption decisions making. Therefore, the null hypothesis, which states that Islamic business ethics have no significant impact on Muslim family consumption decision making is rejected, and alternate hypothesis, which infer that Islamic business ethics have significant impact on Muslim family consumption decision making is accepted. This finding is in line with that of Beekun (1997) study which found that what is considered ethical consumption behaviour may depends on the factors that define and affect consumption ethical behaviour. Factor affecting one's consumption ethical behaviour include; motivational influence, personal influence, family, peer influence and life experiences.

CONCLUSION

It has been discovered that Islamic business ethics have impact on Muslim family consumption decision making on basic purchase or consumption decision such as; to purchase or consume a product or service or not to purchase or consume a product or service. On brand purchase or consumption decisions, Islamic business ethics have impact on Muslim family consumption decision such as; to purchase or consume a specific brand, one's usual brand, a basic model, a new brand, a standard quality, an on-scale brand, a national brand, one's usual brand or some other established brand, more or less than a standards quality, a non-scale brand and a store brand. On channel purchase decisions, Islamic business ethics have impact on Muslim family consumption decision such as; to purchase from a specific type of store, one's usual store, in-home by phone or category, a local store, from some other type of store (e.g. a discount store), from some other store, in-store merchandise and from a store requiring some travel (out-shopping). On payment purchase decisions, Islamic business ethics have impact on Muslim family consumption decision such as; to pay for the purchase with cash, to pay for the purchase with a credit cards, to pay the bill in full when it arrives or to pay for the purchase in installments.

RECOMMENDATIONS

- There is a need for marketers and policy makers to determine how Muslim family makes its purchase decisions and the impact of Islamic business ethics on how the Muslim family affects the future purchase behaviour of its members.
- Marketers and policy makers should be interested in Muslim family consumption decision making process, for a consumer to make decision; more than one alternative must be available. The decision not to buy is also an alternative.
- Marketers and policy makers also should determine how specific subcultural membership interacts to influence the consumer purchase decisions such as Islamic ethics.

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ETHICAL ISSUES AND CONSUMER PERCEPTION ABOUT BRANDED AND UNBRANDED MILK PRODUCTS: THE EMERGING SCENARIO

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ABSTRACT

The fast changing trends in lifestyles, food and eating habits of consumers has resulted in an exponential growth of branded milk products in India. This sector is still predominantly dominated by the traditional low cost loose or unbranded milk in the most rural and semi-urban agglomerations in our country. With rising incomes and health consciousness, demand for branded and quality milk has witnessed phenomenal a sharp rise which in turn has started posing a major challenge to the unbranded milk market. In the changing scenario, the importance of hygiene and ethical considerations in the marketing of milk has acquired paramount importance. This poses a challenge to the sellers of unbranded milk for broadening customer base and retention of their loyalty thus unleashing a fierce competition. The study therefore examines the perception of customers about ethical practices followed in the marketing of branded and unbranded milk. This study is based upon research data collected form capital city of Jammu in J&K State. The findings from the study reveal that host of factors impact customer's sensitivity to ethical practices followed by marketers besides quality and price emerging as significant factors followed by commitment and trust for making purchase decision.

KEYWORDS

Branded Milk, Customer Perception, Ethical Practices, Price and Quality.

PROLOGUE

The marketing of milk and milk products has been undergoing a paradigm shift in India and the emergence of integrated food supply chains is one of the fast growing and most visible market phenomena. About 80 per cent of marketed milk still passes through the traditional channels of handling raw milk and traditionally produced milk products (Kumar and Staal, 2010). These traditional and informal milk marketing chains are the major source of fresh milk for consumers. But the emergence of branded milk marketing chains is posing stiff competition for the survival of traditional milk marketers. The traditional milk marketing still controls the major share of the milk supply in Jammu. The changing lifestyle, eating habits and perception about unbranded milk has helped the marketers of branded milk and milk products to strengthen their presence in the market. In Jammu division, local players namely JK Dairy Processing Cooperative Ltd., (JKMPCL) Satwari and Vaid Milk Products, Gangyal have their strong presence in the market with brands namely Snow Cap and Surya respectively. Although Punjab State Cooperative Milk Producers Cooperative and Gujarat Co-operative also have their presence in Jammu with the brands namely Verka and Amul. Branded milk and milk products are posing a challenge for the survival of traditional chains. Consumers over time have evolved in their perception about the marketing practices followed by the marketers and are reactive to various ethical and social factors in the marketplace. Thus marketing manager must have a thorough understanding of any ethical differences between marketers and consumers as well as the determinants of these differences. This research is designed to study the perception of customers about ethical practices followed by the marketers in the marketing of branded and unbranded milk.

LITERATURE REVIEW

There is a certain paucity of empirical research on customer perception and ethical values that affects the marketing of milk and milk products. A few studies are available which contribute certain insights, to the present article. Anjani Kumar (2010) in **"Milk Marketing Chains in Bihar: Implications for Dairy Farmers and Traders"** carried out a study which identifies the issues associated with the alternative milk market chains and their implications on dairy farmers and traders in Bihar where modern milk market chains especially the milk co-operatives have grown significantly. The study has shown that in spite of growing presence of modern milk supply chains, the traditional milk supply chain is still dominant and seems to offer good opportunities for the small and resource-poor milk producers and traders to enhance their income. The traditional milk sector should be addressed in a constructive manner and the policies should be evolved which would allow informal players improve their performance including quality control and their integration with the emerging modern milk supply chains. Prasad, M.V.Rama (2006) in **"Dairy Products: Consumer Preferences"** reveals that quality is the major factor that influences the choice of the brand and 91.33% of the consumers knew that more than one variety of milk is available in the market. He further found that adulteration and easy availability are other major factors that influence the consumer's inclination for the product. Miller, G.D. (2000) in "**Benefits of Dairy Product Consumption on Blood Pressure in Humans"** has found that there is consensus among experts that low fat dairy products, namely milk, cheese and yogurt, may reduce the risk of high blood pressure decreasing heart diseases by approximately 15 percent and stroke by approximately 27 percent and recommends three to four servings of low fat dairy products daily for optimal blood pressure regulation. D. Babu and Verma N.K., (2010) in **"Value Chains of Milk and Milk Products in Organised Sector of Tamil Nadu —A Comparative Analysis"** has examined the value chains of milk and milk products in the co-operative and private dairy plants in the Salem district of Tamil Nadu based on the data collected from one co-operative plant, one private plant, five milk transportation routes, ten co-operative societies, ten private milk collection centre and six chilling centres. The overall average procurement cost per litre of milk has been found higher for the co-operative dairy plant than the private plant due to increased cost on milk transportation, chilling and reception. The co-operative plant has been revealed more efficient in the manufacture of toned milk, standardized milk, full cream milk and ghee whereas the private plant has an edge over co-operative dairy plant in the manufacture of butter and SMP (skimmed milk powder). The marketing cost of toned milk, standardized milk, full cream milk and SMP has been found lower for private dairy plant and of butter and ghee for the co-operative dairy plant. The marketing margins and marketing efficiency have been found higher in toned milk, standardized milk and butter for the private plant and in full cream milk, ghee and SMP for the co-operative plant.

OBJECTIVE AND RESEARCH METHODOLOGY

Most of the literature so far on the subject has focused primarily on the production of milk and its supply chain side. Thus keeping in mind the above studies, the objective of the present paper is to find out the perceptions of consumers about branded and unbranded milk products regarding ethical practices followed by the marketers.

The data for the present study were collected from both primary and secondary sources. The primary data was collected using questionnaire. To know the perception of consumers about the ethical practices followed by the marketers, primary data was collected from five hundred and fifteen (515) respondents from Jammu City. Random sampling technique was used to select the consumers.

The data collection schedule was developed after reviewing lot of literature (Thomas White 1993, Rezzaque and Howe 2002, M.V.Rama 2006, Sarma 2007, Virdi and Kaur 2007, Sudeep Chatterjee 2007, Bhattacharya and Mazumdar 2009, Sharma and Sharma 2011) and gathering experts' opinion. The schedule has ten items of general information and six dimensions containing fifty four statements relating to product price, quality, quantity, packaging, general honesty, awareness about consumer rights, adulteration, deceptive labeling and legal provisions. Except general information statements, all the statements were based on five points Likert Scale.

TABLE-1: DEMOGRAPHIC ANALYSIS OF ETHICAL & MARKETING PRACTICES

Variables	Frequency	Percentage
Age		
Between 20-30	103	20
31-40	165	32
41-50	156	30.3
51- Above	91	17.7
Gender		
Male	388	75.3
Female	127	24.7
Qualification		
10^{th}	76	14.8
12^{th}	144	28
Graduation	200	38.8
PG & Above	95	18.4
Marital Status		
Married	439	85.2
Unmarried	76	14.8
Occupation		
Business	174	33.8
Service	162	31.5
HW	59	11.5
Others	120	23.3
Religion		
Hindu	328	63.7
Sikh	48	9.3
Muslims	139	27
Others	-	-
Family Type		
Nuclear	384	74.6
Joint	131	25.4
Family Expenditure (in Rs.)		
Between 5000-10000	122	23.7
10000-15000	107	20.8
15000-20000	144	28
20000-Above	142	27.6
Family Income (in Rs.)		
Between10000-20000	115	22.3
20000-30000	86	16.7
30000-40000	101	19.5
40000-Above	213	41.5
Purchase Decisions		
Individual	239	46.4
Elderly	91	17.7
Family Head	185	35.9

Source: Own Survey-2011

RESPONDENTS' PROFILE

The survey was conducted on five hundred and fifteen (115) consumers selecting through random sampling from Jammu city. The proportionate age of respondents was between 20-30 (20%) followed by 31-40 (32%), 41-50 (30%) and above 51 (18%). The proportion of male respondents figured higher (75.3%) than their female counterparts (24.7%). The majority of respondents (64%) were Hindus followed by Muslims (27%) and Sikhs (10%) and three fourth of them have nuclear families. About 39% of the respondents were graduates and 34% were in business sector. The proportionate age of respondents was between 20-30 (20%) followed by 31-40 (32%), 41-50 (30%) and above 51 (18%). Majority of the respondents (75%) were married and 68% had Hindu as their religion. About one third of the total respondents incurred expenditure between 15000- 20000 thousands and (42%) of them earned above Rs 40,000 per month. Finally, about 46% of the total respondents opined that the purchasing decisions were taken by individuals.

TABLE -2: SPLIT HALF RELIABILITY AND CRONBACH'S ALPHA OF ETHICAL & MARKETING PRACTICES

	Before Factor Analysis	After Factor Analysis
Group I	3.27	3.22
Group II	3.19	3.17
Cronbach's Alpha	.7100	.7109

RELIABILITY

To check the reliability Cronbach's Alpha and Split half values were calculated. The data found reliable as the mean values of both the groups (Group I = 3.19 and Group II = 3.17) were almost similar. Cronbach's Alpha value also found reliable as its value was 0.71. (Table-2)

FACTOR ANALYSIS

The factor analysis technique was used for data reduction and data purification. The factor analysis was carried out by using Statistical Package for Social Sciences (SPSS, 17.0 Version). This was done with Principal Component Analysis along with varimax rotation for summerisation of total data into minimum factors. The statements having factor loading less than 0.5 and Eigen value less than 1 were ignored for subsequent analysis. Accordingly seven factors were emerged (Table-3)

TABLE-3: FACTOR ANALYSIS OF ETHICAL & MARKETING PRACTICES

Factors	Mean	Std. Deviation	Factor Loading	Comn.	E.V.	% of V. Ex.
F1	**2.85**	**0.46**			**10.06**	**22.17**
Manipulation of availability for exploitation.	3.23	1.09	0.726	0.65		
Information reg. risk associated with product.	2.37	0.90	0.734	0.82		
Issue bills for every purchase.	2.67	1.06	0.796	0.92		
Meet obligations mentioned in the bills	2.86	0.99	0.769	0.83		
Offer quality products.	3.19	0.98	0.798	0.80		
Offer products in exaggerate packaging	2.89	0.83	0.813	0.82		
Marketers give consideration to your complaints.	2.64	1.23	0.872	0.84		
Maintain hygienic conditions at their place	3.19	0.93	0.764	0.85		
Campaign by the govt. for consumer awareness	3.21	0.96	0.594	0.72		
Legal system is strong enough to create fear.	2.65	1.06	0.808	0.79		
Marketers are always honest in serving consumers	1.66	0.48	0.623	0.73		
Offer deceptive/misleading packaging	3.29	1.14	0.794	0.82		
Offer the same quantity as claimed on the package	3.22	1.07	0.694	0.75		
F2	**3.11**	**1.07**			**8.60**	**17.03**
Provide accurate information about the products	1.95	0.60	0.644	0.77		
Practice professional code of ethics	2.03	0.64	0.585	0.74		
Always conform to the prescribed standards	2.00	0.56	0.654	0.78		
Deceptive communication to persuade consumers	3.97	0.44	0.803	0.81		
Misleading advertising should be avoided	4.01	0.43	0.911	0.87		
Misleading sales tactics should be avoided	4.02	0.44	0.908	0.89		
Sales promotions using deception must be avoided	4.05	0.47	0.899	0.85		
Marketers treat all the customers equally.	1.95	0.63	0.618	0.75		
Ethical practices develop confidence in consumer	4.06	0.48	0.832	0.77		
F3	**4.08**	**1.33**			**3.59**	**15.10**
Loyalty to quality brands than others	4.64	0.48	0.809	0.79		
Adherence to all applicable laws and regulations.	1.37	0.54	0.830	0.79		
Selling of adulterated products due to ignorance	4.64	0.48	0.811	0.80		
Ethically produced food is healthier to eat	4.55	0.55	0.867	0.86		
Willing to pay more for ethically produced brands	4.57	0.65	0.898	0.88		
Need for stringent laws to check illegal marketing	4.76	0.43	0.669	0.67		
F4	**2.04**	**0.32**			**2.15**	**6.81**
Knowledge about Consumer Protection Act.	1.81	1.08	0.696	0.76		
Confront with marketers for unethical practices	2.41	0.94	0.851	0.77		
Complaint with consumer court	1.91	0.76	0.513	0.78		
F5	**3.65**	**0.21**			**1.85**	**6.53**
Sell products which are well before the expiry date	3.77	0.60	0.634	0.71		
Use of deceptive labeling.	3.78	0.86	0.809	0.83		
Underweight the products.	3.40	0.91	0.756	0.86		
F6	**2.9**	**1.27**			**1.65**	**4.97**
Provide access to all the varieties of brands	3.80	1.60	0.861	0.80		
Always give priorities to customer needs	2.00	0.61	0.753	0.70		
F7	**4.02**	**0.12**			**1.25**	**3.67**
Conceal limitations of the products	4.11	0.52	0.599	0.75		
Respect your social and cultural values	3.94	0.64	0.704	0.78		

RESEARCH FINDINGS

The analysis of consumer's perception about the ethical practices followed by the marketers in the marketing of branded and unbranded milk and milk products was carried out by considering various dimensions and is covered under seven factors. Factors are explained as under:

Factor 1: This factor covers thirteen items namely "Manipulating the availability of Products", "Billing for Purchase", "Quality of Products", "Packaging of Products", "Complaints Considerations", "Hygienic conditions at Workplace", " Campaign by Public Organisations", "Fear from Legal System", "Honesty by Marketers while serving Customers", "Deceptive Packaging" and "Product Quantity". About sixty percent of the respondents believe that marketers manipulate the availability of the product for exploitation (M =3.23) and they does not issue bills for purchase (2.67). About 90% of the total respondents believe that marketer's are not honest in serving their customers (1.66).

Factor 2: This factor consists of nine factors containing "Information about the Product", "Professional Code of Ethics", "Conform to the prescribed Standards", "Deceptive Communication", "Misleading Sales Tactics", "Marketers consider all the Customers equally" and "Ethical Practices develop confidence in Customers". More than ninety percent of the respondents opine that marketers conceal the information needed to be share with the consumers (1.95) and more than three fourth of the respondents believe that marketers doesn't follow professional code of ethics (2.03). About ninety percent of consumers believe that marketers use deceptive communication to persuade consumers (3.97) but more than ninety percent of respondents believe that ethical practices develop confidence in the consumers.

Factor 3: This factor includes six factors viz. "Loyalty to Quality Brands", "Adherence to applicable Laws", "Selling of Adulterated products due to Customers Ignorance", " Ethically produced food is healthier to Eat", "Willing to pay more for ethically produced Brands" and "Need for stringent laws to check Unethical Practices". About 90 percent of the respondents believe that they are loyal to quality brands (4.64) but they believe that due to consumers ignorance marketers succeed in selling adulterated products (4.64) although three fourth of the consumers believe that ethical produced food is healthier to eat (4.55) and they are willing to pay more for ethical produced milk and milk products (4.57). Almost all the respondents believe that there is a need for more stringent laws to check unethical marketing practices (4.76) as more than three fourth of the respondents believe marketers disobey prevailing laws in the marketing of milk and milk products (1.37).

Factor 4: This factor encompasses "Knowledge about Consumer Protection Act", "Confrontation with Marketers" and "Complaining with Consumer Court". More than three fourth of the respondents feels they doesn't have thorough knowledge about Consumer Protection Act (1.81) and 70 percent of the respondents believe that they avoid to confront with the marketers (2.41) whereas 90 percent of the respondents never registered any complaint with Consumer Court (1.91).

Factor 5: This factor includes "Expiry of the Products", "Deceptive Labeling" and "Underweighting the Products". Here, more than three fourth of the respondents believe that marketers use deceptive labeling (3.87) but 80 percent believe that marketers sell their products well before expiry date (3.77).

Factor 6: This factor covers "Access to all Varieties" and "Priorities to Customer's Needs". About 80 percent of respondents opine that marketers provide access to all varieties of products (3.80) whereas three fourth of respondents replied that always they doesn't give priorities to their needs (2.00).

Factor 7: This factor covers "Concealing Limitations" and "Respect for Social and Cultural Values". About three fourth of the respondents believe that marketers conceal limitations of the products (4.11) but 46% of respondents believe that marketers respect their social and cultural values (3.94).

CONCLUSION AND IMPLICATIONS

This paper has sought to take a fresh look as to how consumers perceive about the practices being in the marketing of branded and unbranded milk and its related by-products. It has been found that there is a strong association between the income and consumption levels of branded milk. With increasing income levels demand for branded and unbranded milk and milk products has also undergone significant change. The study reveals that most of the marketers' indulges in adulteration and conceal limitations of the product. Marketers are succeeding in selling spurious products as most of the buyers were not aware about their legitimate rights as provided under the Consumer Protections Act .Thus there is an urgent need to have a regular and effective vigilance over the marketers' unethical practices and provide for punitive action against those who indulge into it. An appropriate public and legal mechanism need to be instituted creating awareness among the consumers about their rights and how to lodge a complaint and seek compensation in case they suffer on account of unethical practices. State government must evolve a comprehensive public awareness campaign for informing general public about the redressal mechanism and institutions available at district or state level which address to the scourge of unethical practices. Customer goodwill, loyalty and the resultant captive market share coupled ethical practices can be strengthened by developing a code of conduct for sellers which they adhere to religiously. It would help to avoid legal and punitive actions and can create credible public image and enhanced goodwill in the market. This would be in lines with American Marketing Association. Marketers eventually have to be honest and truthful in their transactions as it would institute sense of fair play and restore confidence among the consumers.

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SOFTWARE PROJECT MANAGEMENT - BEST PRACTICES

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ABSTRACT

Successful development of projects is of primary business interest to any organizations. Failed or 'runaway' projects cost the organizations huge. It is essential for project managers to acquire the knowledge of risks and minimizing risks of project management to manage projects successfully. Risk management aims to identify the risks and then take actions to minimize their effect on the project. In this paper recognizes the increasing role of risk management in present software projects and aims at providing more support in this area. First we overview the objectives and processes of risk management with the particular stress on the need for effective and continuous communication. Risk management is a structured approach to managing uncertainty related to a threat, a sequence of human activities including: risk assessment, strategies development to manage it, and mitigation of risk using managerial resources. Risk management is the total process of identifying, measuring, and minimizing uncertain events affecting resources. This paper was written to help in the objective analysis of the risk management process.

KEYWORDS

Risk Analysis, Risk Mitigation, Risk Avoidance, Risk Planning.

INTRODUCTION

The aim of any software project is to provide the stakeholders with a satisfactory software-based solution of their problem within the schedule and budget limits. The risk of poor product quality and schedule or budget overruns is high which is confirmed by a number of cancelled, delayed or overpaid projects. Effective management of those risks is presently perceived as one of the most important areas of project management [1, 10]. Still, current software processes leave a considerable space for improvement. As process improvement aims at maximizing process quality and effectiveness while minimizing its risks, therefore the support for identification of the most risky process areas and their potential improvement is especially worthwhile. Good project management cannot guarantee success, but poor management on significant projects always leads to failure.

Current risk identification practices adopt primarily two techniques: checklists and group effort (e.g. brainstorming). Checklists such as [3,5,13] help to control the identification scope and protect from overlooking significant risks but they are often too general and do not relate well to actual software processes. Group effort studied e.g. by J.Kontio [4] benefits from synergetic use of human intuition and experience but it exhibits problems with scope focusing and control. Consequently, both existing approaches provide limited output aimed at the process improvement.

PROJECT INTERFACES

Project managers must identify the people or groups the project deals with, both within the parent organisation and outside. A project may have interfaces to:

· initiators;
· end users;
· suppliers;
· subcontractors;
· the prime contractor;
· other subsystem developers.

OVERVIEW OF RISK MANAGEMENT

Risk is formulated in the context of an undertaking, activity or opportunity (e.g. an investment or a project), because risks threaten the success of the undertaking meant by reaching the specified goals [2, 3, 13]. A project takes an opportunity to achieve success and create new value for the client, so it is automatically exposed to the risk of failure. No project is free of risk. A project without risk management recognises that there was a risk after the risk materialises as a real problem (e.g. it becomes obvious that the project overruns the budget or misses the deadline). Then the project team usually reacts and strives to minimise the negative consequences of the problem. As the rule, it is expensive and time-consuming. This price could have been much less if the risk was coped with before it converted to the problem. The lack of open communication, forward-looking attitude, team involvement in the management and the knowledge of typical problems, expose the project to a great risk of failure [4].

The essential factors of the project success are the quality, the time and the budget [13]. In the essential project aspects, the lack of risk management results in:

– schedule slippage,
– budget overrun,
– unsatisfactory quality of the product,
– failure to accomplish business goals of the project,
– disappointment of the employees and breakdown of their careers.

All of these failures refer to the primary project objectives, so they are unacceptable under ordinary circumstances. In some conditions, they may even be critical. The only way to avoid serious consequences of a risk when it materializes is to catch the risk as early as possible and minimise its impact on the project. Though this advice sounds simple, it may be only realised through a defined set of activities focused on risk resolution. Altogether, it calls for a definition and elaboration of a systematic and explicit approach to risk management [9].

The process starts with the identification of existing risks. Once the risks are identified, they are evaluated and prioritised and then appropriate corrective actions are planned and executed. To reach the acceptable level of success guarantee, the introduced actions must be controlled and the risks in mitigation must be continuously tracked for their status. This process continues all through the whole project schedule and across all the phases of development. Although the process is recurring, it may implement pipeline processing, when different phases of the risk management are executed in particular project areas.

Effective Risk Management Involves:

1) Identifying the risk
2) Analyzing each risk to determine its severity
3) Prioritizing the identified risks based on their severity
4) Creating action plans to deal with the high-priority risks
5) Continuous monitoring and followup to ensure that your action plans are mitigating the risk.

RISK IN SOFTWARE PROJECTS

Risk relates to the possibility to degrade the success of an undertaking. The success is defined by a set of criteria that the outcome or the solution must meet to be considered "successful".

The overall success criteria for most of projects include:

• reaching the adequate functionality and quality that provides for achieving the business objectives of the system,
• finishing the project on time,
• keeping the expenses within the budget,
• achieving sustained customer satisfaction.

In terms of a business outcome, the success criteria can for example mean one or a combination of:

• increasing the market share,
• outrunning the competitors,
• improving the effectiveness or productivity,
• cost reduction,
• capturing a particular segment of the market.

Steering away from these goals results in a diminution of the overall project success. The success criteria are often formulated differently from a point of view of each project stakeholder and it is important that they converge and do not knock the project out of its success space.

For a project as a whole, some of the most important risks and their exemplary consequences include:

• lack of user satisfaction – canceling a project, product rejection;
• poor product quality – high maintenance costs, product rejection, adversely affecting the developer reputation;
• missing the deadline – loss of business opportunity, troublesome social and political atmosphere;
• overrunning the budget – financial losses, project cancellation.

From the developer's point of view there are some risks that reflect its particular concerns, like:

• lack of financial stability at the client, delays in payments,
• the client cannot be "convinced" that the product is satisfactory,
• inquisitive, nosy and demanding client.

On the other hand, there are also some risks that are related to the concerns that are specific for the customer, like:

• supplier is unreliable and does not fulfill its commitments,
• exaggerated financial demands of the supplier,
• the product is useless although meets most of the requirements,
• situation changes and there is no more money to finance (otherwise successful) project.

If we take a closer look on the above we can see that the risks perceived from the customer and developer perspectives can sometimes reflect particular interests of the participating institutions that will not necessarily be willing to share them with the other side. This seems to be in conflict with the general principle of information sharing and team approach to risk management. A right approach seems to be to apply a sort of "filter" that imposes some restrictions on otherwise free information exchange during risk identification and assessment activities. Such a filter can be implemented by a dedicated security policy (see Fig.1). The proposed risk assessment process and security policy are described in the subsequent sections.

A Software Project is always subjected to risk. Often the existence of risks in a Software Development system is identified late, and measures are taken to mitigate the risks. Either the risks are covered and the Project is kept on track or in the worst case, the Project is dropped thus reducing too much of time and money loss spent on the Project. There are always risks we know about and the risks which we are unaware of. For instance, if one of the team members is going on a vacation for about 2-3 weeks and has informed prior, then the Project Manager can think of having an alternative, and ensures that the Project is in track. If the risks are known, well ahead then ways and measures of overcoming the risk can be identified. But usually, the risks that arise in a typical Software Project are unexpected. A few of the commonly occurring risks are discussed here:

CHANGING REQUIREMENTS

It's obvious to expect a minor/major change in the Requirements obtained from the clients. While coming up with the initial plan, they may not be very clear on how the system should be or it will look like with the requirements incorporated, but when they are shown a sample of the working model they might come up with few suggestions which might look small from the "Change in Requirements" perspective, but, the same change might take few days to implement from the developer point of view. The Project Manager has to make amendments to the requirement document, the design has to be done for it, the test cases for testing this new change has to be written, the documentation team has to update their documents with the new changes and so on. Whenever a new change comes in again the entire Life cycle is repeated again.

The best approach to adapt to changing requirements is to follow an iterative model where the working model is shown to the clients after every iteration. Each iteration will be between 1-4 weeks. This helps to get immediate feedback or any changes the client wants in the screen can be easily communicated and the developer can incorporate them in the next release. This way the changing requirements from the clients can be easily handled.

LACK OF SKILLS

The Project team may be new to the domain or may be experimenting a new technology. This might consume additional time for the Development process, thus delaying not only the Development phase, but the subsequent phases that follow Development Phase. This can be avoided by either providing training to the Development team before the commencement of the Development Phase or by having appropriate resources who have enough knowledge in the new stream.

FAULTY TECHNOLOGIES

Sometimes it so happens that the Development Team might have to work on a new technology that might have evolved very recently. In such cases it is not advisable to prefer the technology without experimenting it. A part of the Development team can actually take one of the complex requirements and see if the implementation is possible with the new technology. Rather than blindly taking up the new technology without knowing its pros and cons, its advisable to develop a portion of the requirement in the new technology and check for its feasibility.

GOLD PLATING

Gold Plating is a term used to refer the requirements being made robust. For example, the client might have stated a simple requirement like designing a Logon page. But the developer might think of providing some additional features in the page with the thought of providing a rich look to the very first page that every end user is given access to. For designing and decorating the page the developer might consume some of his time which will ultimately result in a lag in the Project Schedule.

UNREALISTIC PROJECT SCHEDULES

There are cases where the client might want to see the working model in a short span and thus might give the Project to a team which bids to give the System in a time within which the Project cannot be completed. The Top Management will pressurize the Project Managers to give short deadlines, the Project Managers in turn the Developers, thus ending up in a state where the Project cannot be delivered in the said deadlines. Hence one of the ways to mitigate risks is to identify all the risks we are aware of and allocate some time to face any unexpected risks, The best approach is to identify all the risks, and check the probability of the risk happening. Then this risk factor can be included in the Project Schedule by multiplying the loss by Probability. For example if one of the screens is underestimated by the developer, and if the Project Manager feels that an additional 15 hours would be required to complete the task accurately, and if the probability of the risk happening is 70%, then a delay of 10.5 hours (70 % probability * 15 hours) is introduced in the Project Schedule.

RISK IDENTIFICATION

During the Risk Identification phase, one makes an inventory of potential risks that may have impact on the achievement of the predetermined objectives [36]. The phase starts with preparatory activities for the actual risk elicitation [30]. It continues with the actual risk elicitation using various techniques such as brainstorming, interviews, scenario analysis, prototyping, and the like [12][30]. When doing it, one identifies risks, their consequences, effects, sources, root causes, and categories [12]. Finally, one creates a risk list and circulates it around all the relevant stakeholders for possible complementary additions, improvements, and confirmation.

The conditions of successful risk identification can be summarized as follows:

- providing a constantly open communication channel,
- involvement of all relevant viewpoints,
- application of diverse identification techniques,
- effective control of the scope,
- learning from the past ("memorizing" risk related information).

RISK ANALYSIS

During the Risk Analysis phase, one analyzes and prioritizes risks [3]. First, one analyzes each risk independently by studying the identified risk and assessing its impact, probability, risk exposure and severity [36]. The analysis can be conducted using different techniques, e.g. matrices, decision trees and scenario analysis [30]. One then groups and analyzes the related risks to facilitate their collective mitigation [30]. Afterwards, one consolidates the risk prioritization and creates a top-priority risk list [3]. Based on the analysis results, one suggests a preliminary plan for managing each risk or risk group. Finally, the prioritized risk list is circulated among the stakeholders for confirmation.

RISK MANAGEMENT PLANNING

In the Risk Management Planning phase, one creates concrete plans determining strategies, options, and actions relevant for managing the identified risks [12]. As depicted in Fig. 5, one starts the phase with studying the risk list, the analysis results, and the preliminary plan [30]. For each risk or risk group, one first determines appropriate strategies [30], and then creates and documents the following three plans:

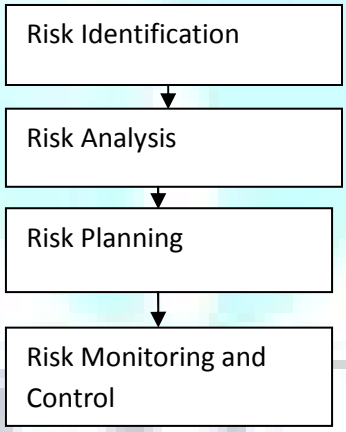
• Control and Monitoring Plan defining relevant measures or metrics for monitoring and controlling the risks [30],
• *Risk Action Plan* determining the actions to be used for treating a certain risk or risk group [36], and
• *Contingency Plan* specifying the actions to be taken in cases when severe risks turn into a serious problem [30].

One then combines all the three plans into one comprehensive *Risk Management Plan* [12]. To ensure that the identified risks get full attention, one prepares contractual agreements, where each risk owner's responsibilities are specified and agreed upon [30]. Finally, one circulates, updates and confirms the plan and its related documentation.

RISK MONITORING AND CONTROL

In the Monitor and Control phase, one continuously monitors and controls the risks according to the risk management plan. One also continuously identifies new risks. To make certain that risks are effectively monitored and controlled, one first ensures that there are risk monitoring procedures established. For each risk or risk group, one then continuously monitors and records the status [30]. In cases when the status changes, one takes measures as specified in the plan. Finally, one updates and records the risk status [12].

FIG.1: OVERVIEW OF RISK MANAGEMENT STEPS



RISK MANAGEMENT CHECKLIST

This checklist is provided as to assist you in risk management.

1) Prepare the Detailed, Planned and documented approach to risk management.
2) Select the experienced project manager for handling complex projects
3) Get the top management approval for risk management
4) Get the requirements well defined, understandable and stable.
5) All the team members should aware of development disciplines.
6) Prepare the resource planning from the beginning of the project

REASONS FOR PROJECT FAILURES

- Lack of user input
- Lack of resources
- Lack of user involvement
- Incomplete requirements and specifications
- Frequently changing requirements and specifications

REASONS FOR PROJECT SUCCESS

- Make everybody a winner in the project
- Identify and manage the risks

- User Involvement
- Top Management support
- Clear Requirements
- Proper planning and estimating schedules

CONCLUSIONS

For developing successful software projects, we have to adapt the best minimization risk strategies. In this article we have listed the possible reasons for project success and project failures. We prepared the risk management check list for completing the successful software projects. A risk for a project is a condition whose occurrence is not certain but that can adversely affect the project. Risk management requires that risks be identified and prioritized and, that actions be taken to minimize their impact. In this paper, we have seen how to identify and manage the risks that might affect the success of a project. Risk management is concerned with assessing and prioritizing risks and drawing up plans for addressing those risks before they become problems. Many of the risks affecting software projects can be reduced by allocating more experienced staff to those activities that are affected. Risk management is an excellent way to prepare for daily challenges.

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RECALLING ANCIENT WISDOM FOR A SUSTAINABLE DEVELOPMENT

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ABSTRACT

Human kind is threatened by a catastrophic situation of social, economic and environment degradation. The contents of this paper are paraphrased to include the meaning of sustainable development, and wisdom from select ancient thought such as --- rèn philosophy, kyosei philosophy, and Jain philosophy. The researcher has done considerable search in the books, journals, newspaper, reports, and web resources to consolidate these ancient thoughts for sustainable development. Contemporary management thinker's states decision are based too much on specific measurable data. But beyond data something more is important which is ignored in the quest for profit. Cumulative effect of Confucian Harmonious order is not merely personal, but collectively social and even cosmic. It is established by Kyosei principles that harmonious relationship with its customers, its supplies, its competition, the Government with which it deals and the natural environment is sustainability. The Jain philosophy believes all souls are equal irrespective of differences in physical forms and mental capability, ranging from the highest human being to the loveliest living microorganism. Therefore drawing knowledge from the above mentioned ancient wisdoms has suggested the a few principles to be considered for application in the organization and in corporate. Today the global landscape has grey shadows of poverty, misery, unscrupulous activities, greed driven by intense materialistic goals, devoid of universal brotherhood.Centuries back these teachings of values and ethics have been written with immense foresight and remain true for application even today

KEYWORDS

ancient wisdom, jain philosophy, kyosei, ren, sustainable development, sustainable principles.

INTRODUCTION

The key theme of twentieth century which requires deep consideration by all alike is freedom, peace, environment and development. Values and ethics are considered utopia, unrealistic ideals to achieve in the current scenario. But for the sustainable development it is worth striving for. Human kind is threatened by a catastrophic situation of social, economic and environment degradation. Every problem faced today is due to lack of tolerance and collaboration. World over from politicians, social gurus, corporate giants and environmentalists are frequently deliberating to find solutions for a sustainable development. Frequently cited Bruntland Commission's brief definition of sustainable development is the *"ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.*" The ethics of mutuality and interdependence is diluted by the greed and the instincts of survival of the human kind.

"Om saha navavatu, sahanau bhunaktu, sahaviryam karavavahai, tejasvi nav adhitam, astu ma vidvishavahai"

May we protect us together, may we nourish us together, may we work diligently, let our learning be brilliant, and may there be no conflicts between us.

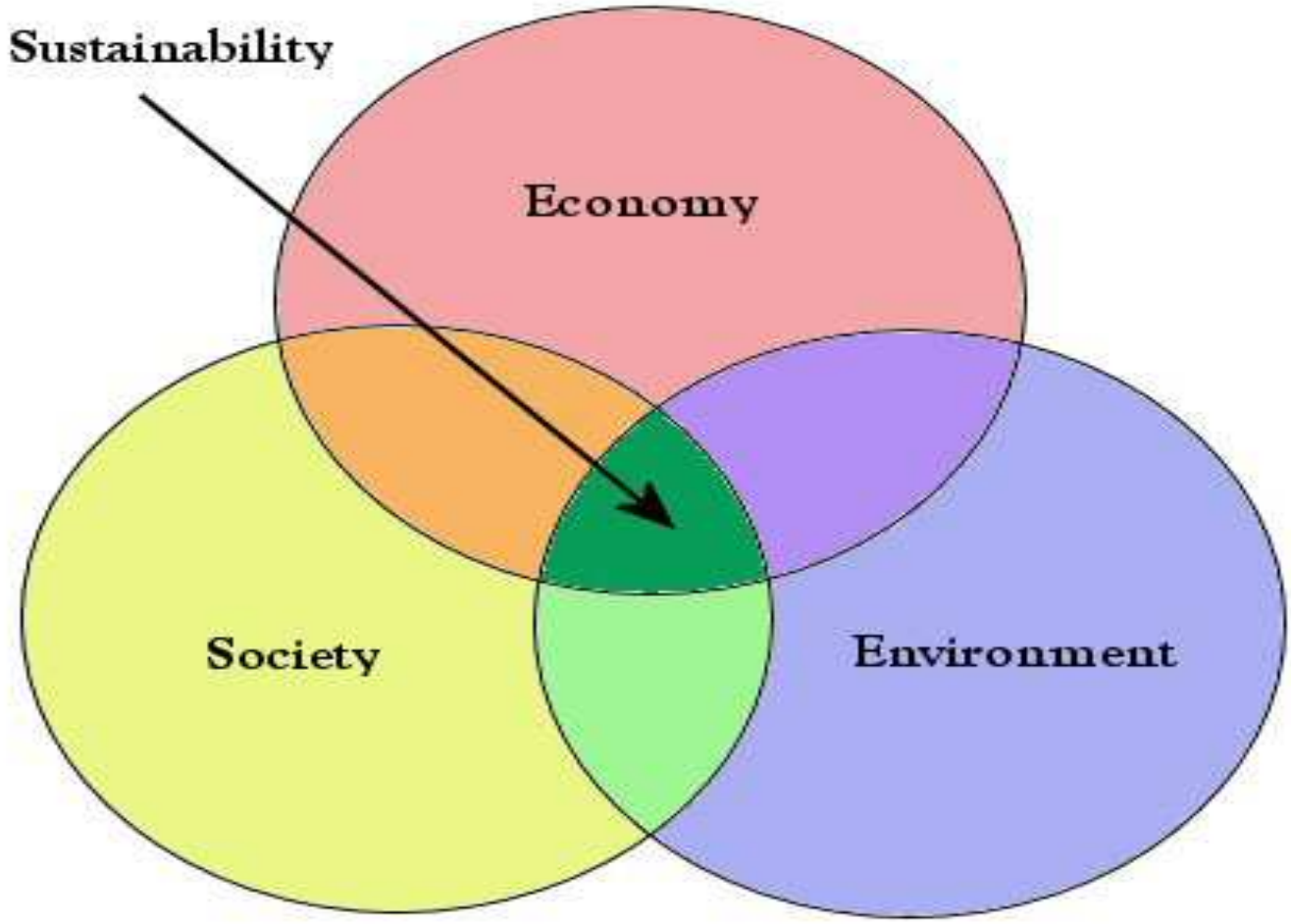
This verse evokes the possibilities of sustainable development and ultimately the happiness that we all seek today. With this brief introduction the author of this paper has attempted to recall a few golden words of ancient wisdom on sustainable development. The contents of this paper are paraphrased to include the meaning of sustainable development, and wisdom from select ancient thought such as --- *rèn* philosophy, kyosei philosophy, and Jain philosophy. The researcher has done considerable search in the books, journals, newspaper, reports, and web resources to consolidate these ancient thoughts for sustainable development. The researcher had also subjected these thoughts for deliberation in a couple of conferences on values and ethics and the findings are also consolidated in this article.

PERSPECTIVES OF SUSTAINABLE DEVELOPMENT

The Johannesburg Declaration states about sustainable development as, "*collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development and environmental protection – at local, national, regional and global levels."*[1] Human needs are basic goods to survive, to realize their dreams with in the culturally defined values and justice to facilitate peaceful coexistence.[2] According to Sri Sri Ravishankar, "*sustainable future of mankind is harmony of the humankind system/ civilization within the system of nature / biosphere of the Planet Earth*." Our thoughts, needs and wisdom have no limitation but the available resources in the Planet are limited. Every individual seeks an ecology ensuring clean air, clean water and healthy environment. Sustainable means something is viable and can be continued over a long time. Human vision needs to be broadened for any development to take place. Stressing on the values as the need of the hour Sri Sri ji says, "*It is necessary to preserve values (like love, passion and dignity) which are slowly evaporating from urban India. We have diluted our own system due to anger and greediness. There can be no development until and unless certain values are restored.*" (www.artofliving.org).

Development is interaction of the triple threat of sustainability – economy, environment and the society; changing and improving these threats to an advanced state to offer "good life" to the human kind is sustainable development. Values, ethics and heritage also play a significant role in sustainable development. The proposed sustainability model is presented in the figure below. The shaded portion symbolizes interconnectivity and is the sustainable area.

[1] The Johannesburg Declaration on Sustainable development, 4th September, 2002
[2] www.ftp.fao.org



Source: www.google.com/images

Sustainability is anthropocentric emphasizing on human values. Contemporary management thinker's states decision are based too much on specific measurable data. But beyond data something more is important which is ignored in the quest for profit. The "lived experiences" of 'people' is completely ignored to achieve "profit' and thus the degradation of the "planet". The predominant philosophy of all religion and faith is "love, care and kindness." This is fundamental to the existence of any living being. If organizations management philosophy imbibes this in its culture the sustainable development is an automatic result. The researcher attempted to study the Chinese Rèn, Japanese kyosei and Jainism philosophy on sustainable development and the findings are outlined in this paper. The researcher has also identified some core principles for sustainability.

RèN – GOLDEN RULE OF HARMONIOUS SOCIAL ORDER

*"A disciple of Confucius asked, "Is there any one word that could guide a person throughout life?" The Master replied: "How about 'shu' (reciprocity): never impose on others what you would not choose for yourself?" "Do not do unto others what you would not have them do unto you." He never stated man was born good or evil, but said, "By nature man was similar, by practice man was apart." (*Analects XV 24)

Confucius perceived that man or women are all born with intrinsic similarities, but is conditioned and influenced by study and practice. *Rèn* is compared of two parts representing "persons" and "two" respectively. *Rèn* relies heavily on the relationships between two people, but at the same time encompassed so much more than that. It represented an inner development towards an altruistic goal, while simultaneously realizing that one was never alone, and that everyone had these relationships to fall back on being a member of a family, the state and the world. The principles of *Rèn* is used directly to li (ritual) and yi (righteousness)

Rèn is innate virtue everyone is born with. Rèn is translated as "benevolence", "perfect virtue", "goodness", or forever with "human heart". Rèn also has a political Confucianism that states, if the ruler lacks Rèn, it is difficult if not impossible for his subjects to behave humanly. This concept believes that an inhuman ruler runs the risk of losing the right to rule.

The maxim of Rèn is best expressed in the following:

(1) One should treat others as one would like others to treat oneself (positive form).

(2) One should not treat others in ways that one would not like to be treated (negative / positive also called Silver Rule).

This is basis of human rights that every individual has a right to just treatment. This philosophy is documented, accepted and signed by 143 respected leaders from across the entire world's major faith including Bahai Faith, Buddhism, Christianity, Hinduism, Islam, Jainism, Brahmanism, Judaism, Sikhism, Native American, Taoism, Theosophist and Zoroastrian.

Rèn also includes traits such as: *Hsin* – One's word compliment his actions; *Li* – properly participate in everyday rituals; *Ching* – Seriousness; *Yi* – Right Action. If these qualities are present then one person is identified as *Chiin Tzu* (Superior Man). This fact reveals that Confucius believed and emphasized that Government (organizations) should be run by ethically superior human beings who concentrate on the welfare of the people they govern. Confucius insisted on moral, political, social and even religious activism. In one of his analects he teaches maintenance of three inter-locking kinds of order; (1) Aesthetic, (2) Moral, (3) Social. The instrument for effecting and emulating all three is ***li*** (ritual propriety).

"Do not look at, do not listen to, do not speak of, do not do whatever is contrary, to ritual propriety" [Analects, 12.1]

In this passage, Confucius emphasizes good manners and taste, morality and social order. By upholding the conventions of elite aesthetic good taste; good manners demonstrate both concern for others and a moral sense of one's place; while rituals are properly performed duplicate ideal social hierarchies of power, whether between ruler and subject, parent and child, or husband and wife. Reverence (*jing*) is considered to be the key quality for harmonious social order. He stresses on filial piety (*Xiao*) as an example of harmonious order.

Confucian order is understood to be both intrinsically moral and profoundly harmonious – when persons and things are in their proper place – relations are smooth, operations are effortless and the good is sought and done voluntarily. A moral ruler will diffuse morality to those under his sway; a moral parent will raise a moral child:

"Let the ruler be a ruler, the subject a subject, a father a father, and a son a son (Analects12.11). Direct the people with moral force and regulate them with ritual and they will possess shame, and moreover, they will be righteous (Analects 2.3).

"One who rules by moral force may be compared to the North Star – it occupies its place and all the stars pay homage to it (2.1)"

Confucianism order unites aesthetic concerns of harmony and symmetry *(li)* with moral force *(de)* in pursuit of social goals: a well-ordered family, a well-ordered state and a well-ordered world. Such an aesthetic, moral and social program begins at home, with the cultivation of the individual or self-cultivation.

"The profound person understands what is moral. The small person understands, what is profitable? (Analects 4.16) The moral force of the small person is like the grass. "Let the wind blow over the grass and it is sure to bend (Analects 12.19)".

Thus cumulative effect of Confucian Harmonious order is not merely personal, but collectively social and even cosmic.

KYOSEI – FOR SUSTAINABLE DEVELOPMENT

"Kyo" means working together, "*sei"* means life. *Kyosei* is a Japanese word, literally meaning, "Co-existence", "living together" or "symbiosis". Kyosei is synonym with the fair business practice propagated under the heading Corporate Governance to earn profit by righteous methods. In the modern day business, "*Kyosei"* was applied as a Corporate Philosophy in 1988 by Canon Inc., of Japan. This brilliant concept was re-defined to mean more positive by Canon and defined to mean, "*Living and working together for the common good".* A detailed definition by Canon of Kyosei is "*all people, regardless of race, religion or culture, harmoniously living and working together for many years to come*". The Chairman of Canon Inc. Mr. Ryu Zabino Kaker advocates it as the new world order.

Kyosei initiative suggested to achieve in Canon was to ultimately achieve customer satisfaction including customer gratitude and respect thereby achieving and sustaining continual prosperity for the company. This initiative dictates activities called Sensitivity Conscious Management (SCM) which rejects the maxim "the end justifies the means" and takes a view point, "choose the right means to the end". SCM action pattern are: develop original technologies, get patent, respect competitor's original technologies, strive to exercise segmentation or form partnership; aim at optimum share as opposed to maximum share, avoid wasteful competition as it drops profit, dampens enthusiasm and the benefit to consumers is lost.

Kyosei initiative at Cannon also places importance on the environment and its affect on the humanity. It is interpreted to mean, "Economy, Ecology and Ethics Initiative". It is believed that this Triple EEE initiative will only help to attain and sustain continual prosperity for the company. In the present millennium it is assumed that everything is limitless, but the reality is earth's supply of resources, humanities patience is all limited. There consciousness to ecology and ethics play an important role to achieve economic returns. For more than a decade and half Canon cherished *Kyosei* principle to establish harmonious relationship with it customers, its supplies, its competition, the Government with which it deals and the natural environment.

There are also other corporate giants practicing kyosei. The researcher has identified a few of them. The Somitomo Group of Company still observe these operational rules in its Article: *"Steadiness and reliability are of the greatest importance for the prosperity and stability of the organization; any action to make speculative profit is strictly forbidden".* Matsushita Electric to Panasonic still follows the founders Konosuke Matsushita Mission Statement: *'relieve poverty and create wealth, not only for shareholders, but for society".* Their modern day code of management objective is, *"recognizing our responsibilities as industrialists, we will devote ourselves to the progress and development of society and the well-being of people through our business activities, thereby enhancing the quality of life through the world."*

The Japanese Federation of Economic Organization applied *Kyosei* while developing its Charter for Good Corporate Behavior which includes:

- Corporation will develop and provide socially useful goods and services giving full consideration of safety;
- Corporations will engage in fair, transparent and free competition;
- Corporation to maintain healthy and sound relation with politics and Government;
- In overseas operation, corporation will respect cultures and customs of hosting society.

The Caux Round Table meeting was held at Caux, Switzerland in 1986, formed by members from business and education from all over the world, particularly Europe, Japan & US adopted kyosei ideals in framing their principles for the modern business enterprise. To quote, "*the value of a business to society is the wealth and employment it creates and the marketable products and services to consumers at a reasonable price commensurate with quality …… survival is not a sufficient goal …… businesses share a part in shaping the future of those (global) communities".*

JAIN PHILOSOPHY OF INTERDEPENDENCE

The Holy text of Tattvarha Sutra (5.21) states: "*parasparopagraho jivanam*" meaning "*all life is bound together by mutual support and interdependence*" The dictum is "*life forms render service to one another*". This offers an alternative to the modern belief of success "*survival of the fittest*". All life is interconnected. Every soul influences each other through service -- favorable or unfavorable, beneficial or harmful. Together the souls have to share the pleasure and pain. The faith and philosophy of Jainism is described by Shri Arun Kumar Jain as:"*Jainism firmly believes that life is sacred irrespective of caste, color, creed or nationality and thus not only physical or mental injury to life should be avoided, but all possible kindness should be shown towards all living beings*." In the opinion of Shri Singhvi L M author of Jain Declaration of Nature: "*Jain cosmology recognizes the fundamental natural phenomenon of symbiosis or mutual dependence which forms the basis of modern day science of ecology*." The philosophy believes all souls are equal irrespective of differences in physical forms and mental capability, ranging from the highest human being to the loveliest living microorganism. Therefore human being must act in a responsible manner and show compassion and forgiveness to all. This highest order of living being (human being) are endowed with all the six senses: seeing, hearing, tasting, smelling, touching an three more elements mind, thinking and ego. Human being must be full of equanimity and act responsible towards all life by being compassionate, ego less, fearless, forgiving and rational.

APPLICATION OF SUSTAINABLE PRINCIPLES

Therefore drawing knowledge from the above mentioned ancient wisdom has suggested the following principles to be considered for application in the organization or society:

	That is …….	This means	This does not mean
Be Solution minded	Be innovative, add value	--understand everyone's requirements; -- look beyond standards; -- pursue win-win situation; -- understand mutual values	--say yes to everything; -- disregard regulatory measures; -- deliver for free; --we will go beyond the scope of our activities.
Take Ownership	Take responsibility, be proactive and resolve issues)	---take charge; --- get to the root and pursue sustainable solutions; --- actively engage to seek ideas and inspiration; --- take ownership of our mistakes	---ignore issues thinking others will handle; ---- pass the problem; ---- act beyond authorities; ---- disrespecting our near and dear to solve others problems
Be Committed	Set proper expectation, follow up, commitment	----proper expectation and follow up; --- respond as and when promised; ---- explain when you have to say no; ---- be true to your word.	---commit to everything; --- promising something that cannot be delivered; --- not expecting honor from others; --- taking unfair advantage of our resources.
Show Empathy	Be a good listener	----understand others point of view; ---- show genuine concern; ---- communicate in easy words; ---- ask for others idea before important decisions are made.	----accept everything of others; ---- assume we know what is best; ----- expressing frustration of internal system; ---will not enter into tough negotiation.
Be passionate	(Be enthusiastic)	----walk that extra mile; ---- bring positive energy; ---- believe in our roles and ability; ---- strive for excellence.	----being emotional and dramatic; ---- do not assess holistically; --- disregards others reaction; --- overwhelm others

The United Nations Millennium of Declaration values prescribed for sustainable development are: freedom, equality, solidarity, tolerance, respect for nature and shared responsibility. How much time is lost in debating the details of various aspects, sweating the small stuff? Great leaders are able to bring people with diverse perspectives and personalities together to bring about an understanding and consensus. Although each may only experience a certain part of the elephant, it's still an elephant.

CONCLUSION

While summarizing ancient wisdom described in the above paragraph the following emerges: reciprocity should be practiced throughout one's life; virtue, not profit should be the goal of the superior man; there should be a balance between self-interest and altruism; Respect to relations, obedience to and respect for one's own parents is paramount; one should love learning, live the simple life practice what has been learned. All faith reiterates human kind do not exist in isolation; we are a part of a larger and more complex family (literally and figuratively) where harmony can be achieved by acting appropriately with one another. Thus, these Philosophies are treasures of wisdom in having quality life personally and in business / profession. 'Acharya Mahapragya Memorial Lecture on sustainable development through ethics and value-based education' in New Delhi in November agreed that sustainability and spiritual principles go hand-in-hand. "Creation of wealth should be concurrent with inculcation of ethics, values and spirituality. If, in the process of development, we lose our character and culture, it is only a matter of time that we will lose our development as well," says Arun Gupta, president, ISKCON Temple, Idaho, US.[3] In Bhagavad Gita Krishna says: "Work for the common good without selfish interests; the rewards of selfless work will take you to a supreme state." Centuries back these teachings of values and ethics have been written with immense foresight and remain true for application even today. Today the global landscape has grey shadows of poverty, misery, unscrupulous activities, greed driven by intense materialistic goals, devoid of universal brotherhood. *"On this account, the ruler will first take pains about his own virtue. Possessing virtue will give him the people. Possessing the people will give him the territory. Possessing the territory will give him its wealth. Possessing the wealth, he will have resources for expenditure. Virtue is the root; wealth is the result" (The Great Learning X, 6-7).*

Let us all remember and practice: "Sarveh bhavantu sukhinah" — "Let the whole world be in happiness."

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RADIO FREQUENCY IDENTIFICATION (RFID)

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ABSTRACT

Radio Frequency Identification (RFID), has been around since the late 60's. It appeared in tracking and access applications during the 1980s. RFID is an automatic data capture (ADC) technology, which comprises of a small data carrying token called tag and a fixed or mobile scanner called reader, which allows non-contact reading. It is an advanced wireless technology, which is effective in manufacturing, asset awareness and other hostile environments where barcode labels cannot survive. The technological advances have both brought down the cost and allowed its use for far more applications.

KEYWORDS

Radio Frequency Identification (RFID), RFID tag, Active tag, Passive tag, Reader.

INTRODUCTION

RFID system consists of:

- **Reader:** It contains a transceiver, decoder and antenna or coil. It is also called interrogator.
- **Transponder:** It consists of a tiny chip of silicon (microchip), smaller than a grain of rice, with a coiled antenna. It can carry any information from retail price to medical records. It is also called *RFID tag*. It may also come in the form of RFID cards. It is electronically programmed with unique information. RFID tags have ability to store information, which can be transmitted wirelessly to RFID readers.

RFID is the generic name for technology that uses radio waves to automatically identify individual items that carry such identification tags. By using tags that can be monitored from remote readers, companies can collect accurate and detailed information in real-time. As the technology has developed "*the devices have become smaller, smarter, more durable and cheaper*" (Ferguson, 2002). The wealth of data available from deployed RFID could be a solution to the information-handling challenge that marketers increasingly face. Ferguson (2002) contends that the *'silent commerce'* of this object-to-object communication will be transformational, arguing that *"as RFID systems become more sophisticated and widespread, they will begin to reshape companies, supply chains, even entire industries. It is no exaggeration to say that a tiny tag may one day transform your business"*.

REVIEW OF LITRATURE

RFID promises a number of important benefits. Compared to existing technologies it offers operational advantages such as speed, ease of use, flexibility of deployment, and opportunities for unobtrusive use (see Lipide, 2004). Using these capabilities companies using RFID can monitor stock in real-time to prevent out-ofstock problems, an issue that costs Wal-Mart $600 million annually (www.rfidjournal.com). Moreover, RFID offers real-time visibility as tagged products can be tracked anywhere in the world. However, monitoring does not end when the product is sold; if active tags remain on goods after a purchase is made, there is nothing to stop retailers from tracking what other purchases consumers make, which products they place with their goods and where they buy them. As Glazer (1991) He posits that an interesting task is to compare the level of 'information intensity' between companies, i.e. the level of profits attributable to information assets. As an information-handling issue, it seems strange that in the information age many marketers still struggle with both the quantity and content of the information they are faced with.

Fisher et al. (2000) contend that the ability to "*offer the right product in the right place at the right time for the right price*" has remained "*frustratingly elusive*". They argue that *"you would think that we'd have captured it by now, particularly given the enormous amount of data that retailers and e-tailers can gather about points of purchase, buying patterns, and customers' tastes. But many retailers have a long way to go"*

Friend and Walker (2001) contend that "*the time is right for a technology that brings control to what was risky, rigor to what was intuitive, and science to what was guesswork*". Technologies like RFID may well be capable of providing the information required to bring much needed clarity to the increasingly complex role of marketing.

Zaltman (2003) argues that current practices such as CRM do not tell the marketer anything about "*why customers do what they do, think what they think, and why they like or don't like products…Getting that level of insight requires more intensive interactions with customers. It requires that you develop a poetic insight into customers- a deep knowledge that enables you to intuit their answers to questions you haven't even asked them"* (Zaltman,2003:2). Along with other marketing practitioners and academics, Zaltman contends that advanced ICTs such as RFID may provide a way to developing such deeper knowledge.

Bessen (2003) argues that ICTs can "*cut through the confusion and sort the most relevant data from the daily flood,…as despite the obstacles, few marketers dispute the need to coordinate and integrate information*".

Harvard Business School's Marketing Professor Gerald Zaltman (2003) along with many other marketing practitioners and academics, contend that advanced ICTs such as RFID is one sure way of achieving this deeper knowledge.

McCullagh (2003) states, "*it becomes unnervingly easy to imagine a scenario where everything you buy that's more expensive than a Snickers will sport RFID tags, which typically include a 64-bit unique identifier yielding about 18 thousand trillion possible values"*.

Andal-Ancion et al (2003) contend that "*new technologies…have well-known but often unrealised potential to transform businesses and industries*". In their empirical study of twenty North-American and European companies, the authors found that one of the major driving factors behind the digital transformation of traditional businesses was information intensity.

Codd (2005) argues that Irish retailers stand to benefit substantially from RFID in terms of improved supply-chain management and increased customer knowledge, urging marketers in the retail sector to initiate early links with advanced technologies. At the same time, a number of barriers to the adoption of novel ICT exist.

WORKING OF RFID SYSTEM

Radio frequency identification is a technology used to collect product, place, time or transaction data quickly and easily without human intervention or error.
To start with, the reader transmits electromagnetic waves (low-power radio signal), through its antenna. The tag receives it through its own antenna to power its chip. This signal serves as a request for the RFID tag to transmit the unique identifying number; similar to scanning a barcode, but using RF (radio frequency) instead of light. The RFID reader reads the information from the chip (RFID tag) without direct contact. This means the tag is not required to be swapped through the reader; however it has to be passed through the range of the reader. Readers are installed at locations where data capture is required or may also be in the form of portable readers. Thus the reader can be configured either as a hand-held or fixed-mount device.
The reader's antenna emits radio signals in the range from 1 inch to 100 feet or more, depending on the reader's output power and radio frequency (RF) used. When the tag passes through the electromagnetic zone it senses/detects RF signal i.e. the activation signal from reader. In response it sends the stored information. The reader decodes the data encoded in the tag's Silicon chip and passes this tag information to the host computer (back end system) via. wire or wireless serial communication links, for further processing. The reader can even deliver that information to any electronic device like a cash register, a video screen, a home appliance or directly into the internet.
The set of computers to which the reader sends data collected from tags is known as the "Savant." The Savant aggregates data from different readers, filters it and passes it on to other supply chain systems that make decisions based on the data.

MIDDLEWARE

In any supply chain there are millions of tags read. These tag codes have to be tied to meaningful information leading to large amount of data with complex interrelationships. RFID middleware standardizes ways of dealing with loads of information which the tiny tags produce.
The interrogators are available in a variety of shapes and sizes. They can be handheld or installed. They can be built into a doorframe to receive tag data from persons or things passing through the door. It can be mounted on an interstate tollbooth to monitor traffic passing by. The electromagnetic field produced, by an antennae can be constantly present, when multiple tags are expected continuously. If constant interrogation is not required the field can be activated, whenever required by a sensor device.

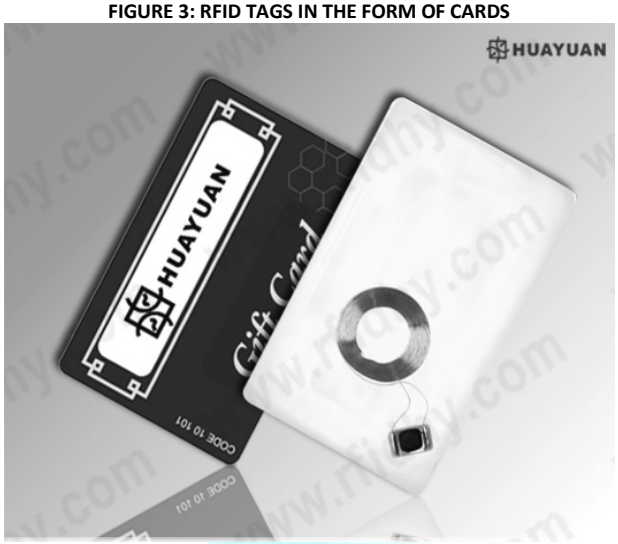
FIGURE 1: RFID READERS

Handheld RFID reader **Stationary RFID reader**

RFID tags come in a wide variety of shapes and sizes. Human and animal tracking tags, inserted beneath the skin, can be as small as a pencil lead in diameter and ½ inch in length. They come in the form of smart labels that are stuck on boxes; or are inbuilt in smart cards for paying for items or access applications. (Smart cards have dimensions of credit cards). In addition, RFID tags used to track heavy machinery, trucks and railroad cars for maintenance and tracking applications come in the form of 5 by 4 by 2inch rectangular transponders. Such tags are sticked on your vehicles windshield to enable you to pay tolls without stopping.
Size of tag depends on what you are tagging and how much intelligence you want the tag to have or whether the tag is read-only or read-write (programmable).

FIGURE 2: RFID TAG IN THE FORM OF SMART LABEL

FIGURE 3: RFID TAGS IN THE FORM OF CARDS



CLASSIFICATION OF RFID

I. RFID TAGS ARE CATEGORIZED AS EITHER ACTIVE, PASSIVE OR SEMI-ACTIVE

Active RFID tags are powered by an internal battery and are read/write i.e. tag data can be rewritten and/or modified. An active tag's memory size varies according to application requirements (some systems have memory up to 1MB). The power supplied by battery of an active tag generally gives it a **longer read range.** The trade off is **greater size, greater cost and a limited operational life** (which may yield a maximum of 10 years, depending upon operating temperature and battery type.)

Tags which, can operate without an external power supply, are called passive tags. These obtain operating power generated by reader. Actually when a reader emits electromagnetic waves they couple with antenna of tag to form a magnetic field. Passive tags gain/draw power from this magnetic field.

Consequently, passive tags are much **lighter** than active tags (no battery), **less expensive** and offer a virtually **unlimited operational lifetime**. The trade off is that they have shorter read ranges than active tags and require a high-powered reader.

Read-only tags are usually passive and are programmed with a unique set of data (32 to 128 bits), which can't be modified. Read-only tags most often operate as a license plate into a database.

Semi-active tags do have a battery, but depend on the energy provided by the reader to communicate with the same. That way semi-active tags tend to act like passive tags, while the on-board battery of the tag is used for other functions such as collection of environmental data i.e. data pertaining to environment to which the tagged object is exposed.

Type of tag / Characteristics	Active	Passive
Tag battery	Yes	No
Tag power supply	Internal to tag	Energy transferred to tag by reader
Availability of tag power	Continuous	Only when the tag comes in the field of reader
Range	Long range (> 300 feet)	Short range (< 9 feet)
Data storage of tag	High	Low

Traditional Bar Codes vs. RFID

A printer printing traditional bar codes to be applied to products

A roll of RFID chips ready to be applied to products

II. RFID SYSTEMS ARE DISTINGUISHED BY THEIR FREQUENCY RANGES AS LOW FREQUENCY SYSTEM AND HIGH FREQUENCY SYSTEM

Low frequency systems operate in the range of 30KHz to 500 KHz, they have short reading ranges and lower system cost. They are most commonly used in security access, asset tracking and animal identification applications.

High frequency systems operate in the range of 850 MHz and 2.4 GHz. They offer long read ranges (greater than 90 feet) and high reading speeds. They are used for applications such as railroad card tracking and automated toll collection. However the high performance of high frequency RFID system incurs higher system cost.

The read range for passive tags depend on a lot of factors i.e the frequency of operation, the power of the reader, interference from metal objects or other RF devices. In general, low-frequency tags can be read from a foot or less. Majority of high-frequency RFID transponders have read range of less than 3 feet while some have read range which extent up to 6 to 8 inches. Nowadays UHF tags come with a read range between 20 to 25 feet. Where still longer ranges are needed, active tags are used to boost read ranges to 300 feet or more. [1] Read range depends on many factors, but the size of the transponder's antenna, the size of the reader's antenna and its output power are the main ones.

III. THERE ARE TWO TYPES OF TAGS: READ-ONLY AND READ-WRITE TAGS

It is the microchip in the tag which makes a tag read only or read-write. In read-write tags EEPROM (electrically erasable programmable read-only memory) chip is used. Information can be added to the tag or written over existing information using a special electronic process. However the read-write tags are expensive and are used only in some specialized applications.

The read-only microchips have information stored on them during the manufacturing process itself. The information on such chips can never been changed.

ADVANTAGES OF RFID OVER BARCODES

RFID and barcode are two different technologies which have some common applications. However RFID automates cumbersome processes, such as manual recording and bar code scanning. As the costs go from dollars to pennies per tag, soon RFID will replace traditional barcode technology (where applications are same) due to several shortcomings of barcodes:

1. **NO STOCK STORAGE CONSTRAINT**

The biggest distinguishing advantage of all types of RFID systems (above mentioned) is the **non-contact, non-line-of-sight** nature of technology, unlike barcodes. Barcodes require line-of-sight to be read i.e. the barcode is required to be oriented towards the reader for it to read. RFID tags can be read as long as they are within the range of a reader. In fact, RFID tags can be read through a variety of constraints such as walls, snow, fog, ice, paint, grease, oil and other visually and environmentally challenging conditions, where barcodes and other optically read technologies are useless.

2. **HIGH SPEED**

Moreover RFID tags can be read in these challenging circumstances at **remarkably high speeds** i.e. less than 100 milliseconds.

3. **READ AND WRITE CAPABILITY**

The **read/write capability of an active RFID system** is also another significant advantage in interactive applications such as work-in-process or maintenance tracking. Once a bar code is printed, it cannot be modified whereas RFID tags can use programmable microchips. Thus the tags can be programmed and re-programmed to hold variety of data depending upon the application. It is actually the chip in the tag, which can be programmed and reprogrammed. Though RFID is a costlier technology, as compared to barcode it is widely used for automated data collection and identification applications.

4. **MINIMUM LOSS/DAMAGE**

Barcodes are prone to loss or damage as they are stuck to the outside of packages and so can be easily damaged. If the label is ripped, soiled or falls off, there is no way to scan the item. Tags are usually embedded in objects, which are to be identified.

5. **NO HUMAN INTERVENTION**

RFID helps to track items automatically without human intervention. Barcodes require human intervention to operate the barcode scanner.

6. **LESS OPERATING TIME**

As humans are not involved for operating RFID system i.e. it is not required to swap the tag across the reader, the reader automatically senses the tag, it minimizes the time involved in the identification process as compared to barcode system.

7. **CAPABILITY TO HOLD LARGE INFORMATION**

RFID system can store huge amount of data as it has larger memory (2KB) as compared to barcodes. In addition to large data, the tags also contain protocols that can determine who can read selected parts of that data; On the other hand barcodes can not be programmed and can provide only the most basic information like manufacturer and the product number and price. They do not have a unique ID. For example: The bar code on one drug bottle is the same as every other, making it highly impossible to identify which one reaches its expiration date first.

DISADVANTAGES OF RFID

1. **REDUCTION IN STRENGTH OF RF SIGNALS**

a. The RF signal strength falls off inversely to the distance traveled.

b. Though RF signals can pass through walls; their strength is degraded by passing through walls or any other such obstacles.

c. When RF signals are reflected by metallic surfaces their strength reduces.

2. **RF SIGNALS CAN NOT PASS THROUGH METALS**

Though RF signals can pass through opaque objects there are certain materials such as metals, through which they can not pass. Moreover their strength is further degraded by reflecting off metal surfaces.

This makes tracking metal products difficult, though with a good system design and engineering this problem can be overcome.

3. **RADIO WAVES ARE ABSORBED BY WATER AT HIGHER FREQUENCIES**

This makes RFID working difficult in water or with objects with high water content difficult, though a good system design and engineering can overcome this problem.

4. **RF SIGNALS COLLISION**

When RF signals from two RFID tags collide with each other the waves cancel each other consequently making the tag detection difficult for the RFID reader. This difficulty can be overcome by implementing anti collision algorithms. Anti-collision algorithms enable the reader to read more than one tag in the same field of the reader.

5. **HIGH COST**

RFID systems are costlier than barcode systems; though the Passive tags cost a magnitude less than Active tags. The Passive tags can cost as little as 30 cents or even less if bought in bulk whereas active tags can cost far more. Some Active tags even come with temperature or pressure sensors built in, which cost more than $100.

6. **VULNERABILITY TO COMPROMISE**

It is possible to compromise an RFID system by wrapping the tagged object in two to three layers of ordinary household foil to block the radio signal. Clearly, bringing household foil into a library using RFID would represent planned theft. It is also possible to compromise an RFID system by placing two tagged items against one another so that one tag overlays another. That may cancel out the signals. Of course, this requires knowledge of the technology and careful alignment.

APPLICATIONS

As RFID promises real return of investment, manufacturers and retailers have started adopting it aggressively. RFID business applications fall into three main categories:

I. **SECURITY**

RFID systems can be used for security of individuals as well as assets. RFID systems can track the location of individuals, pets or vehicles. RFID tags are used in proximity cards that allow an individual or item to pass through a doorway or checkpoint.

II. **REGULATORY COMPLIANCE**

RFID systems can be used to capture real-time information about an individual, item, or transaction and then automatically record the data to meet regulatory requirements, such as Food and Drug Administration regulations. It proves to be useful through out the manufacture cycle and logistics till a product reaches a customer.

III**. ASSET TRACKING**

RFID systems can be used to identify the precise location of assets such as products, supplies, materials and even people or patients in a hospital to give businesses end-to-end visibility and control, directly improving profitability.

VARIOUS APPLICATIONS OF RFID SYSTEM WHICH FALL UNDER SEVERAL ABOVE MENTIONED CLASSES ARE EXPLAINED BELOW

AUTOMATED TOLL COLLECTION

Nowadays RFID is used to automate toll collection at bridges and tunnels. Drivers are given small plastic box with a RFID chip (tag) inside, which allows them to drive through the tollgates without stopping. The RFID reader, in the tollbooth senses the information on the tag's chip and the toll is automatically deducted from the driver's account.

SMART SHELVES

Another wide scale application of RFID is in the retail shops, where smart shelves have come into use. A reader placed on retail shelf can automatically sense when the store is low on inventory and accordingly place order to restock. This is how inventory management is being transferred from manual chore to automated one. Thus for the retailer, RFID helps to indicate empty shelves.

ELECTRONIC ARTICLE SURVEILLANCE

As RFID devices are becoming inexpensive, manufacturers have started including them in several consumer items such as clothing, cosmetics as well as car tyres. For example, Gillette has planned to use RFID tags to track individual packages of razors.

At the same time, RFID reader is placed in the cash register. This allows the customer to simply walk past the cash register with their purchases and the RFID equipped register reads the RFID chips on goods purchased and automatically deducts the purchase amount from their account.

In this way, RFID can be used in checkout counters. The effective range of RFID devices is about 3-5 feet, making it easy to capture the ID reliably, when the person walks through the doorway of a super market. Thus RFID is used for accurate tracking of merchandise within the store. This has drastically reduced theft or "shrinkage" in retail business. It also speeds up the billing process. Thus self-aware products from RFID enable the efficient management of product through the back door of the store and all the way to selling floor.

Note: Unlike barcodes, which are identical for every unit of the same product, RFID no. is unique in each unit.

"Extra Stores" (part of Metro retail chain) of Germany is utilizing RFID tags for inventory management grocery shoppers are thus getting accustomed to electronic store management. The primary goal is cost reduction and increased speed. The "Extra Stores" features RFID checkout lanes and "smart shelves".

TRACKING PAPER CURRENCY

The European Union is planning to place a tiny chip in every paper Euro note for two purposes viz. providing counterfeiting protection and the ability to give each bill a unique serial number.

MAINTAINING MEDICAL RECORDS

An American company, **Verichip**, is developing an RFID chip, which will permanently store your **medical records**. This chip will be implanted under your skin, so that any hospital equipped with a reader can know all your health history even if you are unconscious.

ANIMAL TAGGING

A simple version of this chip is implanted in animals to help **track and identify pets.**

The following images show how RFID tags are implanted in human bodies

FIGURE: RFID TAG INJECTIONS IN HUMAN BODY

(1) (2) (3)

(4) (5)

Image (1) : The injection needle preloaded with the RFID tag EM4102 chip.

Image (2) : The doctor checks the hand out to give the approximate "landing site" for the implant before doing the injection.

Image (3) : Checking the hand - Iodine has been applied and the lidocaine is readied. Numbing the hand before injection helps separate the tissue as well as kill the pain.

Image (4) : The doctor injecting the RFID tag (chip) into the hand between the index finger and the thumb.

Image (5) : RFID chip ranging in dimension from 2x12mm to 3x13mm injected in the hand.

SURVEILLANCE

RFID technology can also be used by the police. If RFID tags are placed in clothing, it can be used to track individuals wearing these clothes. It can be used to **track prisoners** who break through (flee) from prisons.

AIRLINE BAGGAGE RECONCILIATION

An RFID is now being used in **Airlines** also. It is estimated that lost luggage costs the airline industry in excess of $100 million annually **tracking luggage** with RFID causes significant reduction in lost baggage. It reduces cost of compensation payments to customers and consequently improves customer service.

Vehicle anti-theft system and car immobiliser (which prevents the vehicle from moving or operating normally):

RFID is used in controlled access to vehicles, parking areas and fuel facilities- depot facilities being typical.

RFID immobilizer is used in automobiles to prevent the vehicle from being stolen. It has been ten years since the Ford Motor Company first introduced an RFID immobilizer and such systems are common in vehicles manufactured by the other major manufacturers as well.

RFID microwave would set itself to properly cook an entrée. An RFID equipped refrigerator can report on phone that it's out of milk. If you keep ingredients on a RFID counter it suggests appropriate recipes.

RFID can also directly connect physical objects to internet. For example, if you don't remember how to program your TV remote control, you can just wave it in front of an RFID reading internet terminal which will automatically bring up the latest instruction page from the manufacturer's website.

For the manufacturers, RFID provides labor savings and operational efficiency which return top-line benefit across production lines and through distribution**. Manufacturers can track products through all points of production on and off the line, throughout the product's life cycle**

This helps reduction of errors via automation, such as reduction in mis-shipments, lost inventory and errors in redundant data reads. Productivity gains are also generated by RFID, which enables better management of skilled resources through automation.

TRANSPORTATION AND LOGISTICS

Today RFID finds applications throughout the supply chain, in:

- Manufacturing
- Distribution
- Retail
- Consumer applications

RFID allows visibility across the supply chain from manufacturer to distributor, which increases efficiency throughout. This is possible because RFID technology's ability to collect real time information (where, when, condition) and store that information online, allowing for request based online access by all value chain players.

RFID has the potential to determine how far a product has traveled through the manufacturing cycle, determining how far downstream it is and offering true product visibility. This generates tremendous benefits, instantly detailing when a product was manufactured, whether the retailer has received it or where it is now. In this way, RFID ensures consistency of data throughout a business. Furthermore, this data can be shared across cooperative networks that feed the whole **supply chain: manufacturer, distributor, broker, retailer and end consumer.**

Gillette is among one of the manufacturers leading in implementing RFID in its products. Any merchandise shirts, shoes etc. can be tagged.

Some of the other prominent applications include:

1. Asset management: Protection of valuable equipment against theft, unauthorized access or removal.
2. Access Control: To Control access of personnel to secure or hazardous locations.
3. Time and attendance: To replace conventional "slot card" time keeping system.
4. Animal husbandry: for identification, especially in poultry farms etc., in support of individualized feeding programmes.
5. Sport time recording.
6. Electronic monitoring of offenders at home.
7. Postal, courier, cargo tracking.
8. Pharmaceutical Industry and healthcare
9. Waste management.
10. Building security, and library systems.

Use of RFID is endless. It is used in healthcare, pharmaceuticals, food industry, military, animal (pets) identification, security access, anti-theft retail systems, asset and inventory tracking, automatic toll collection, livestock and wildlife (endangered species) tracking, house arrest monitory system, manufacturing and processing (work in process data), shipping container and air cargo tracking, fleet (group of aircraft or ships sailing together commanded by the same person, especially during war) tracking. Thus the data stored in RFID tags is used for identification in any process, it may be merchandise, vehicle or any other asset, animals or individuals. RFID has applications in every sector of industry, commerce and services where data can be collected. The attributes of RFID are complimentary to other data capture technologies. Therefore RFID is used for those applications where other data capture technologies cannot survive.

STANDARDIZATION

If the unique advantages of RFID were the good news, then the incompatible RFID standards was the corresponding bad news. All major RFID vendors offered proprietary RFID systems a few years ago. The standards based on incompatible RFID systems existed for rail, truck, air traffic control and tolling authority usage. The lack of open systems interchangeability had severely crippled RFID industry growth as a whole. However, a number of organizations have been working to address and hopefully bring about some commonality among competing systems, both in the US and in the Europe where RFID has made greater market inroads. ISO has already adopted international RFID standards for animal tracking, ISO 11784 and 11785.

It is only recently that a few standards that define the various aspects of operation of the RFID Technology have come up. Some of them are: The Auto-ID standard set up by Uniform Code Council (UCC) and EAN International, and promoted by the Auto-ID consortium. At present, the UCC standards offer the most compatible technology for RFID systems, and are the de-facto standards for all commercial implementations. [1]

THREAT TO PRIVACY

If "live" unique RFID tags pass beyond the point of sale and are carried out into the consumer's world, they pose a strong threat to privacy. The unique ID in a garment or a car could be read silently by any organization, the organization doing the surveillance need not be the manufacturer or retailer, it may be a hobbyist snoop or a private investigator. (a snoop is a person who secretly looks around a place in order to obtain information, especially in ways that people do not consider proper or legal.) Thus people can misuse customer information. They may even sell it to some other organization. Businesses, which allow RFID devices to escape live from their premises, will be recklessly endangering the privacy of their customers. Vast databases of records of people's movements will become available to telemarketers, Government investigators and divorce lawyers. This scenario must be avoided, by ensuring that no RFID tags contaminate the consumer world.

To protect privacy, any business selling articles to consumers, containing an RFID device should permanently disable them at the point of sale. Alternatively, an explanatory warning must be attached to the tag indicating that the consumer must remove the tag before use. Another way is to attach the tag to the price tag, which the customer usually removes prior to use.

As such RFID is in controversy because it can track the customers who buy the merchandise. Consequently their privacy is at threat. It is essential to "kill" (destroy) the chip at the point of purchase, once it's pricing and inventory functions are completed. But some people disagree with the idea of "killing" RFID chips as they can imagine some post purchase uses for the tiny chip. For eg. A reader equipped washing machine could properly adjust itself for the clothes that have been loaded, provided the clothes have RFID chips in them.

RFID - MYTHS AND REALITIES

With increasing use of RFID technology in many applicable areas calls for better understanding of myths and realities of the said technology. Following are some of those which need clarification to the end users of the RFID.

HARMFUL TO HEALTH?

People have a misconception that RF waves are hazardous to health. However this is not true. RF signals are not harmful for human beings and the environment. The power levels used for any RFID applications are well below the power levels that have harmful effects. In fact passive RFID tags do not radiate RF energy, but simply reflects it. Therefore there are no health dangers caused by proximity to or wearing clothing containing RFID tags.

TRACKED BY CAR KEYS?

Some automobile manufacturers include RFID system in the vehicles for vehicle tracking, as immobilizer, for vehicle safety in general. People think that they can be tracked by their car keys. This is not possible because the transponders used have a very short reading range (typically a few inches) and use encryption between the key and the reader. During manufacture of the vehicle, the engine management computer generates a different random number (that is, the secret key for encryption) for each and every key. Unless that secret number is known, the vehicle key will not respond. In addition, the reader would have to be within inches of the key to give the key enough energy to even work.

CITIZEN'S PRIVACY?

The general public has a threat that governments will implement RFID system to keep an eye on every citizen to deter crimes. But this is just a misunderstanding as the infrastructure costs for a government entity to track all citizens would be astronomical. It would require a tremendously large data base to keep a track of each and every citizen moving from point to point. The practicality of such an application is well beyond any government's capability to afford the infrastructure and data management issues.

INTERFERE (ELECTROMAGNETIC INTERFERENCE) WITH OTHER SIGNALS USED BY GOVERNMENT BODIES?

Some people fear to use RFID system thinking that the RF signals may interfere with other signals used for tracking by Government bodies and consequently create problems for them. This is not true as governing bodies worldwide restrict the output power of RFID systems. It is illegal to exceed these limits, and in most countries it is a condition of sale that the RFID equipment operates at regulated frequencies.

REPLACE BARCODES?

Though RFID have a lot of advantages over barcodes RFID will not replace bar codes.

RFID and bar code will live side by side in the supply chain for years to come. Certain transactions will be executed automatically as goods pass through RFID portals, while other operations will take place by workers scanning bar-code labels. RFID can be layered-in on top of existing ERP or Warehouse Management System (WMS) solutions, letting both forms of data capture transact with a single system of record with out disruption to the ERP or Warehouse Management System.

CONCLUSION

Radio Frequency Identification (RFID) is an automatic data capture (ADC) technology, which comprises of a small data carrying token called tag and a fixed or mobile scanner called reader, which allows non-contact reading.

The reader transmits electromagnetic waves (low-power radio signal), through its antenna. The tag receives it through its own antenna to power its chip. This signal serves as a request for the RFID tag to transmit the identifying number. The RFID reader reads the information from the chip (RFID tag) without direct contact. The interrogators and the transponders are available in a variety of shapes and sizes.

RFID systems are distinguished by their frequency ranges as low frequency system and high frequency system. RFID tags are categorized as either active, passive or semi-passive. There are two types of tags: read-only and read-write tags.

RFID technology has several advantages over barcode system; they are: No stock storage constraint, High Speed, Read and Write capability, Minimum Loss/Damage, No Human Intervention, Less Operating time, Capability to hold large information etc. however it has a few drawbacks as well; they are: tag collision, cost, RF waves are reflected by metallic surfaces, absorbed by water at high frequencies, RF signal's strength reduce when passed through walls and through large distances, RFID system can be compromised etc.

RFID find applications in almost all known areas like automated toll collection, personnel surveillance, tracking assets, vehicles, paper currency, animals, airline luggage and even prisoners, throughout supply chain: in manufacturing, distribution (transport and logistics), in retail (electronic articles surveillance and smart-shelves), consumer applications (in washing machine, refrigerators),time and attendance marking, sport time recording, postal, courier, cargo tracking, pharmaceutical industry and healthcare,, waste management, in library system and the list is unending.

Though there are a few myths regarding RFID, a greater awareness is overcoming the hurdles, and more and more people from diversified domains are embracing RFID technology.

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SERVICE QUALITY MODELS IN HEALTHCARE - A REVIEW (1990-2010)

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ABSTRACT

It is estimated that "doing things wrong" typically accounts for between 30 and 40 per cent of a service organization's operating costs. There is significant misunderstanding of the various aspects of service quality. While the literature concerning service quality dimensions in the healthcare industry is replete with studies from the developed world, researchers from developing countries have been exploring the applicability of the related models and frameworks in their specific context (Padma et.al, 2009). The primary aim of this study is to enhance understanding of "service quality in healthcare" and to identify (HCSQM) Health Care Service Quality Models that managers in the service industry can employ to improve quality. The researcher identified the gap and presented suggestions to future research.

KEYWORDS

Behavioral intention, Customer satisfaction, Healthcare services, Quality measurement, Quality models.

INTRODUCTION

Healthcare is described as the "world's largest service" (Kenagy et al., 1999). Factors like opening up markets, increase in use of IT, increased customer knowledge and awareness, etc, becomes a must to deliver the services better than its competitor at agreed price (Seth and Deshmuhk, 2005). In the current business scenario, service quality needs a fresh understanding. Several researchers explored the subjects with varying perspectives and using different methodologies.

The criteria for choosing published material for review include the models derived based on the dimensions which gives significant impact on healthcare. This review includes the service quality and its outcome such as patient satisfaction, behavioral intention and loyalty. It examines 14 different hospital service quality models reported in the literature during the period 1990-2010. This research contains hospital service quality models empirically tested and conceptually proved research and presented in chronological order.

The models disclosed that the healthcare service quality outcome and measurement are dependent on various dimensions and geographical settings. This review is not an abstract, an opinion from sequential development along with continuous updating of models. The research differs in definition, models, measurement, data collection procedure and data analysis etc. The review becomes the base to researchers and practitioners to modify the existing quality concepts and bring out the new one, either conceptually or empirically. The models are covering brief discussion about healthcare service quality dimensions, sample selection, demographic variables, service quality outcomes, data analysis, scale development etc. This research does not measure hospital service quality. It gives an insight to hospital service quality models.

OBJECTIVES

The main objective of this review is to critically appraise various service quality models in healthcare, particularly in hospitals in the light of the changing business scenario. The other objectives are identification of factors influencing service quality and to find the gap in the existing models.

HCSQM-1: AUTHOR: REIDENBACH, SANDIFER-SMALLWOOD, 1990

Patient confidence, business competence, treatment quality, support service, physical appearance, waiting time, empathy

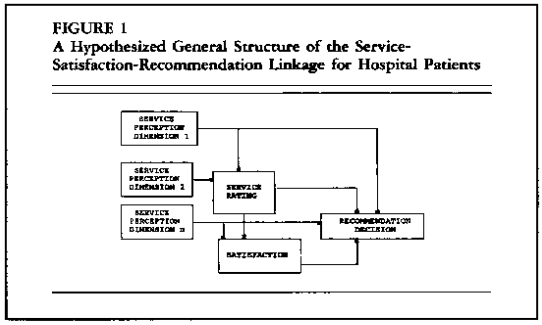


FIGURE 1
A Hypothesized General Structure of the Service-Satisfaction-Recommendation Linkage for Hospital Patients

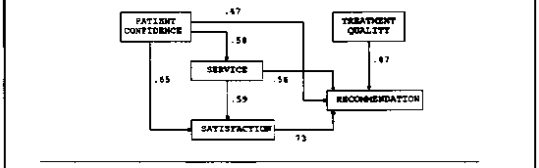


FIGURE 2
A Hypothesized Model of the Service-Satisfaction-Recommendation Linkage for Outpatients

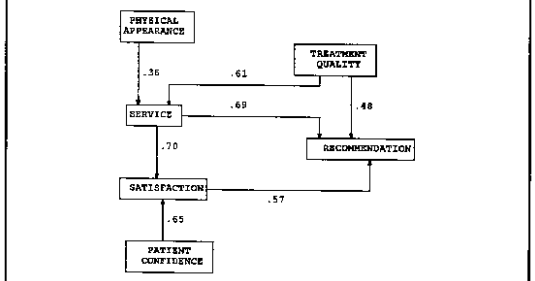


FIGURE 3
A Hypothesized Model of the Service-Satisfaction-Recommendation Linkage for Emergency Room Patients

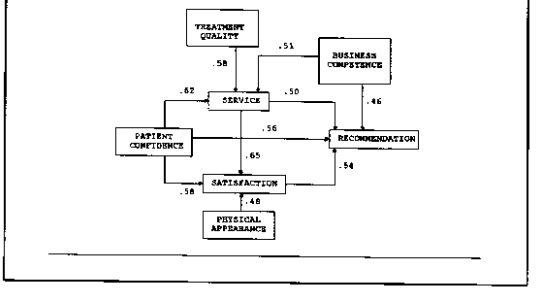


FIGURE 4
A Hypothesized Model of the Service-Satisfaction-Recommendation Linkage for Inpatients

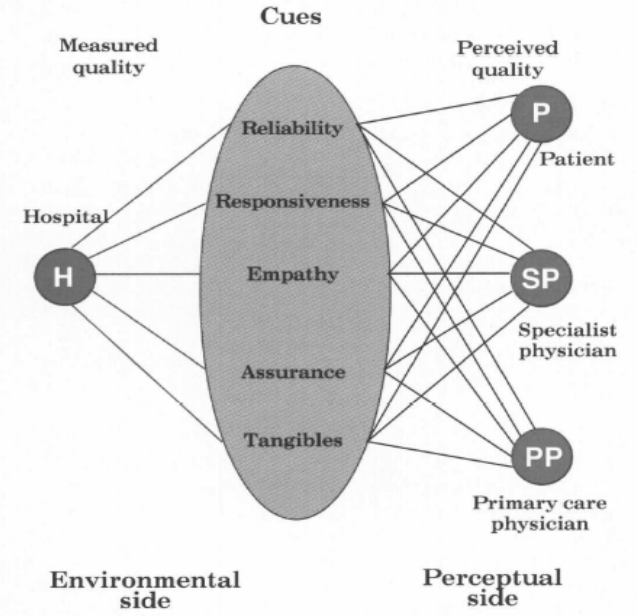
To understand the relationship among patient's perceptions of inpatients, outpatients, and emergency room services and their overall perceptions of service quality with their care and willingness to recommend the hospitals services to others, the authors provide work for three models using modified SERVQUAL instrument includes seven dimensions. 300 patients surveyed through telephone using stratified sample. The authors employed 5 point Likert scale anchored by "Very good" to "Very bad" to rate the service quality of the hospital. They conducted factor analysis and identified "Patient Confidence", first identified by the authors, which has significant impact on patient satisfaction. Treatment quality is found to be another significant variable towards outpatient and emergency room patient to recommend the hospital. Added to that, perceiving physical appearance makes an impact on emergency room patient. They found that overall service quality perceptions of patients, their satisfaction and their willingness to recommend to others were strongly correlated to each other in different hospital settings, namely, in-patients, out-patients and emergency care patients.

HCSQM-2: AUTHOR : LICATA, MOWEN, GOUTAM 1995

Competence, reliability, understanding, credibility, access, listening skills, facilities, personal association, responsiveness, patient preference, specialist affiliation, geographic convenience

EXHIBIT 1

The Marketing Lens Model (MLM)

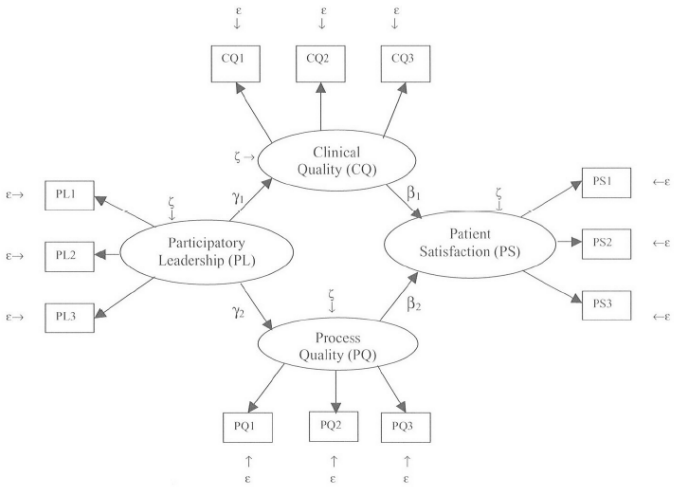


Every one involved in the medical channel has their own views and perceptions. In relation with this, a Marketing Lens Model was first proposed by the authors to diagnose quality perceptions in a complex exchange channel. To be successful in a complex medical channel all the parties who are involved should view the key stimuli through similar lenses. To identify the key stimuli the authors designed a questionnaire in three versions, each one for primary care physician, specialists and patients. In their versions they employed two dimensions as medical competence and hospital characteristics along with 15 attributes ("1 for below average to 5 for exceptional") to rate the quality of the hospital. Samples were taken from 991 bed metropolitan private hospital with 670 affiliated physicians. Their findings articulated the views as Primary care physicians and specialists assess overall hospital quality in terms of medical competence but patients consider both medical competence and hospital characteristics. Customer satisfaction assessments from customers and from internal sources (.eg. quality managers) are highly correlated. Using factor analysis they identified that patients and physicians were using similar lenses (patterns of cues) in assessing the quality of the hospital.

HCSQM-3: AUTHOR : MARLEY, COLLIER, GOLDSTEIN, 2004

Participatory leadership, clinical quality, process quality, patient satisfaction

Figure 1: Hypothesized causal model of the determinants of hospital patient satisfaction.



The authors bring out a casual model of the determinants of hospital patient satisfaction. In their model they focused on clinical and technical medical care that emphasizes on "what" performance patient receives and "how" the services are delivered. For the investigation purpose they have taken three constructs as leadership, clinical quality and process quality on patient satisfaction. The hypothesized model evaluated using structural equation modeling with a sample size of 202. The data collected from U.S hospital from a member of hospital management like director / vice president of quality / quality manager. Every item was measured using a 7 point Likert scale. Their results suggest that hospital leadership has a significant impact on process quality than clinical quality. But clinical quality in health care is top priority for doctors, hospital leaders, and patients. Both clinical and process qualities are important, clinical quality is the order qualifier and process quality is the order winner. They found that the "personal" care relating to communication, empathy and caring by hospital personnel were the determinants of patient satisfaction. Moreover the ability of patients to evaluate process quality than clinical quality has its own impact on patient

satisfaction. They opined that the patient is not necessarily the best evaluator of clinical quality, as they may not have the opportunity, expertise or equipment to evaluate clinical quality. Moreover the ability of patients to evaluate process quality than clinical quality has its own impact on patient satisfaction, at the same time the leaders influence on process quality and clinical quality and in turn create patient satisfaction.

HCSQM-4: AUTHOR : KARA, LONIAL, TARIM, ZAIM, 2005

RATERC (P&E)

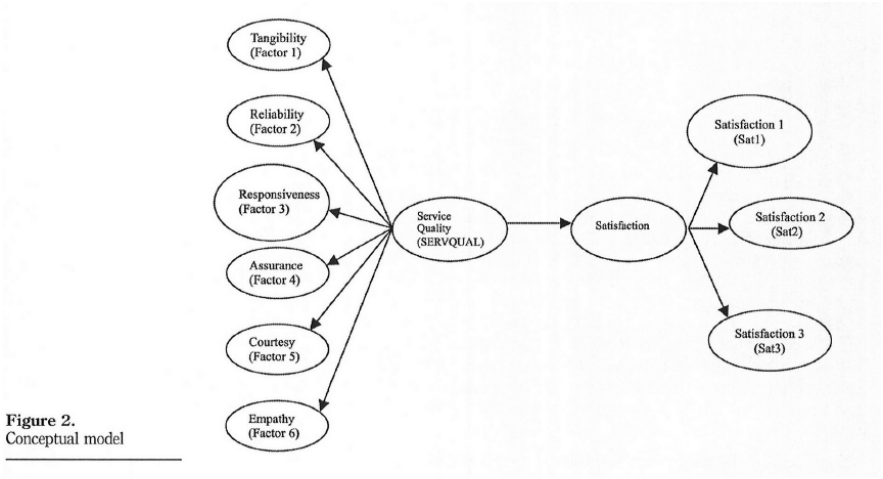


Figure 2. Conceptual model

The researchers empirically examine the tangible and intangible determinants of service quality and the relationship with customer satisfaction using a structural equation model. To test the model they used AMOS and found that all intangible factors are associated with service quality are more important than the tangible. The samples were 139 and updated SERVQUAL (Carman) instrument (RATERC) was administered to collect the data from inpatients. Courtesy and Assurance were found the top scores to become an important service quality factors. There fore they concluded that attitude, behavior of the employees and trust on nurses, billing, and employees, to the patients and their families are very important intangible factors that can affect service quality. Reliability and Tangibility are the least scorers. Satisfaction context was shown in three dimensions as repurchase intention, overall service quality and overall satisfaction and all of them are statistically significant and highly related with satisfaction.

HCSQM-5: AUTHOR: ZINELDIN, 2006

5Q – quality of object, quality of process, quality of infrastructure, quality of interaction, quality of atmosphere

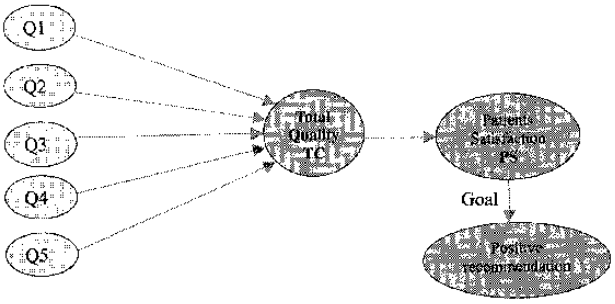


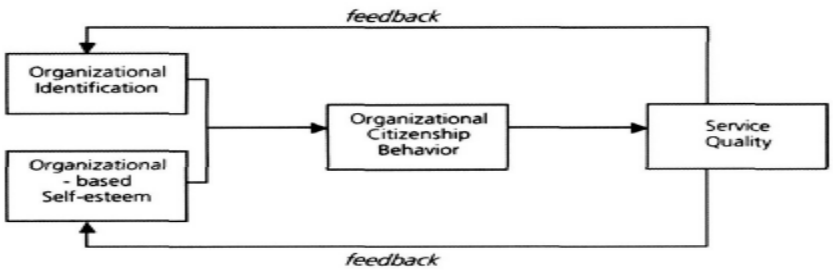
Figure 2. Zineldin's 5Qs: a multidimensional model of health care attributes and patients satisfaction

The author derived a comprehensive model using five quality dimensions namely quality of object, quality of processes, quality of infrastructure, quality of interaction, quality of atmosphere in which 48 attributes were identified. He examined the major factors affecting patient's perception of cumulative satisfaction in Egypt and Jordon. Using the instrument 224 usable questionnaires were used (inpatients) to collect data. Samples were collected from one public hospital, one semi-public hospital and new and modern private hospital. The constructs were measures through multiple item scales and a five point Likert scale was used ("very good to very bad"). The analysis shows that Patients satisfaction with different service quality dimensions has direct impact with their willingness to recommend the hospital. The author shed light on the shortcoming of the quality issues such as quality of infrastructure and quality of atmosphere influence patient satisfaction in public hospitals and semi-public hospitals. At the same time, in private hospitals quality of infrastructure, quality of process and quality of interaction plays major role in patient satisfaction.

HCSQM-6: AUTHOR: BELLOU, THAN OPOULOS, 2006

Organisational identification, organizational-based self-esteem (OBSE)

EXHIBIT 1. OCB ANTECEDENTS AND IMPACT ON SERVICE QUALITY

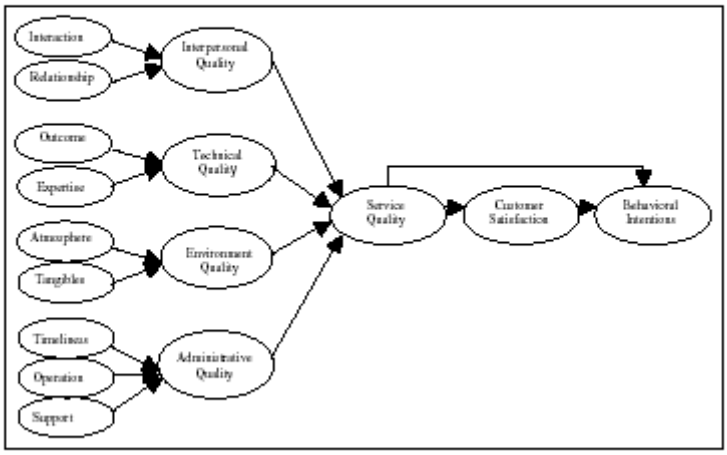


The model highlight the importance of organizational citizenship behavior (willingness to contribute to the hospital) to enhance the service quality in hospital. They carried out the study in Greek public hospitals in a sample of 233 doctors and nurses from two pathology clinics, as they interact with patients and provide direct health care. The variables used in their research are organizational identification and organizational-based self-esteem (OBSE). In their analysis they found doctors were affected by OBSE alone, whereas nurses are affected by both OBSE and organizational identification. Excellence in customer service is the hallmark of success in service industries. Employees who exhibit higher organizational citizenship behavior for coworkers or their hospital will be more active in the fulfillment of patients needs which will consequently be reflected in patients evaluation of service quality. Perceptions of quality have a strong influence on patient's inclination to avail themselves of health services. To enhance OBSE, managers could grant direct recognition and reward of both effort and results, which will increase OCB towards the hospital.

HCSQM-7: AUTHOR : DAGGER, SWEENEY, JOHNSON, 2007

PERCEIVED SERVICE QUALITY – service satisfaction, behavioral intention, interpersonal quality, technical quality, environment quality, administration quality, interaction, relationship, outcome, expertise, atmosphere, tangibles, timeliness, operation, support

FIGURE 1
Full Conceptual Model

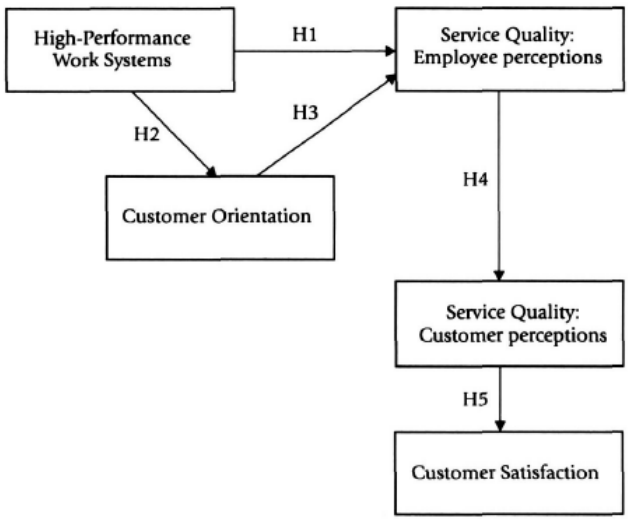


The authors developed a multidimensional hierarchical scale for measuring health service quality and empirically validated the scale's ability to predict important service outcomes, such as, service satisfaction and behavioral intentions. They identified service quality perception drivers as four primary dimensions and nine sub dimensions. The primary dimensions were interpersonal quality, technical quality, environmental quality and administrative quality. The sub dimensions were interaction, relationship, outcome, expertise, atmosphere, tangibles, timeliness, operation and support. The authors collected data from qualitative study and three different field studies of health care patients in two different health care contexts namely oncology clinics and general medical practice. In qualitative study, using purposive sample was considered appropriate, total of 28 participants, 7 focus groups were involved in the age between 18 – 72 as medical insurance holder and proven diagnosis of cancer. To develop the scale, samples were selected from private outpatient oncology and general practitioners clinics using exploratory and confirmatory samples techniques. The model provides evidence that service quality has a considerable impact on service satisfaction and behavioral intentions. Their results indicate that service quality perceptions mediated the relationship between the primary dimensions and behavioral intentions. Each service quality and service satisfaction had a significant impact on behavioral intentions. But service qualities have greater total effect on behavioral intentions than satisfaction.

HCSQM-8: AUTHOR: SCOTTI, HARMON, BEHSON & MESSINA, 2007

High performance work systems, employee perceptions of service quality, customer orientation, customer perceptions service quality, customer satisfaction.

Conceptual Model



The authors investigate the chain of events through which high-performance work systems (HPWS) and customer orientation influence employee and customer perceptions of service quality and patient satisfaction. They presented a conceptual model for linking work environment to customer satisfaction. They employed 113 samples in Veterans Health Administration ambulatory care patients. Stratified, random-sampling design adopted for the survey sample selection. To construct the instrument for, independent variable, HPWS a ten-item (goal alignment, communication, involvement, empowerment, teamwork, training, trust, creativity, performance enablers, and performance-based rewards) scale derived from the VA employee survey. Customer orientation was measured by three-items from the VA employee survey. Employee-perceived service quality was measured with two-item scale derived from the employee satisfaction survey. Customer-perceived service quality was measured by two-item scale from the customer satisfaction survey. Finally customer satisfaction was measured by a single-item from the VHA customer survey. They found a significant relationship between employee perception and customer perceptions of service quality as well as customer perceptions of service quality is a strong driver of their satisfaction. They added that enhancing service quality and customer satisfaction, rather than inflating costs, contributed to cost efficiency. Their finding expressed that HPWS is linked to employee perception which in turn linked to customer perception and ultimately have a link to customer satisfaction.

HCSQM-9: AUTHOR : PRIPORUS, LASPA, KAMENIDOU, 2008

Tangibles, reliability, assurance, interpersonal communication, responsiveness, total satisfaction

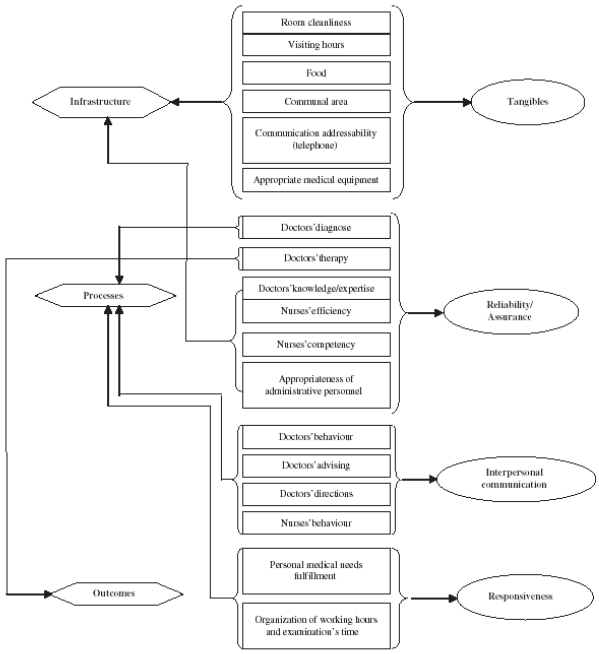


Figure 1: Satisfaction items

The authors investigated the quality of Greek hospitals and patients characteristics on patient perception. 225 patients were taken as sample from 7 nonprofit hospitals; using the structured questionnaire the data were collected form urban and rural areas to see the disproportional volume of patient served in the hospitals. Questions were scored using Likert scale ("1= very disappointed to 5= very satisfied"). According to the results that educational status, type of medical insurance and the emergent admission significantly affect perceptions of satisfaction. Compare to females and older people, males and young people rate satisfaction a little higher. Added to that regarding responsiveness they identified that personal medical needs gained high priority among other variables. Apart from that there is no clear indication of differentiation between rural and urban patient's perceptions.

HCSQM-10: AUTHOR: STEINKE, 2008

Service training (ST), managerial practices (MP), physical design (PD), job design (JD), job satisfaction (JS) and employee empowerment

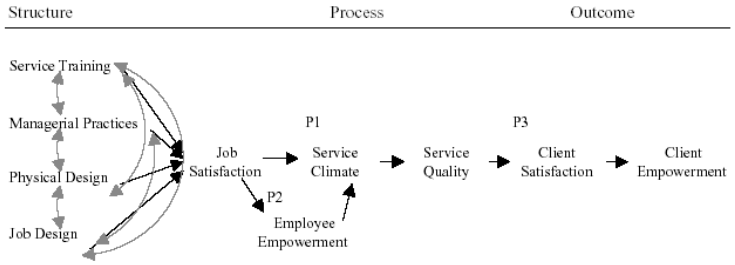


Figure 1.
The service outcome chain (the research model)

The author empirically investigates the mediating role of service climate (SC) on service quality (SQ) and client satisfaction (CS) using a modified version of service profit chain. In this study the variables are service training (ST), managerial practices (MP), physical design (PD), job design (JD), job satisfaction (JS) and employee empowerment. The researcher used 180 employees (registered nurses) from emergency departments in Canada were taken as sample to opine about internal and external service quality. Structural equation modeling (SEM) was implemented using LISREL showed that service climate have positive impact on outcomes in healthcare. SQ, CS and CE were fully mediated by SC, rather JS and empowerment were partially mediated the relationship between managerial practice, physical design, job design and service climate. Added to that Frontline providers (nurses) contribute to service quality this consecutively gives an impact on attitudes, cognitions, and intentions (perceptions) of clients.

HCSQM-11: AUTHOR: PADMA, RAJENDIRAN, PRAKASH, 2009

Infrastructure, personal quality, process of clinical care, administrative procedure, safety measures, corporate image, social responsibility, trustworthiness of the hospital

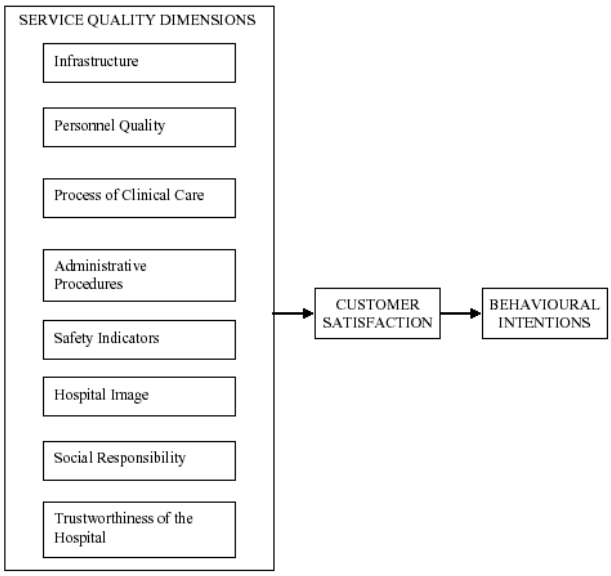


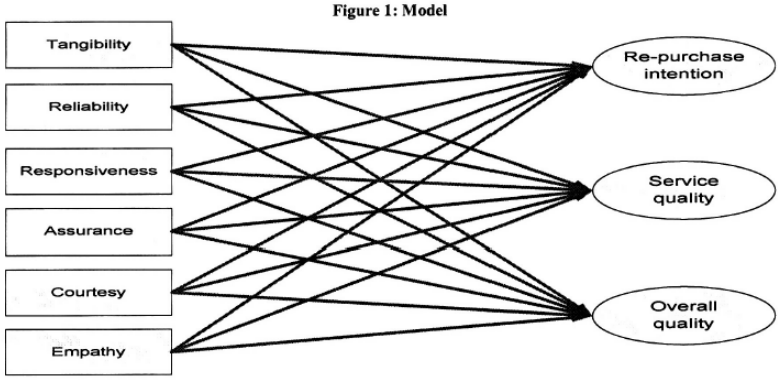
Figure 1. A conceptual framework for healthcare service quality

The researchers proposed a conceptual framework to measure service quality from the perspective of patients and attendants in the hospital. They derived two instruments for measuring the dimensions of hospital service quality, one for patients and another one for attendants. Here they defined "Quality" as satisfying customer needs. To satisfy customers the hospitals can use one of the quality management techniques such as 'house of quality' using customer perceptions as 'voice of customer'. The satisfaction can be spread out through word of mouth to their families and friends, which will leads to loyalty. The loyal customers are willing to pay more for enhanced services. To prove the above concept a path analysis of Quality →Customer satisfaction → Behavioral Intentions be done. For the organization purpose the researchers developed an instrument to collect data about their customers' perceptions to benchmark their services with their competitor's services. In the instrument they suggested 7point likert scale to measure the patient's perception of services provided by the hospital, where "1" indicates "very low" level of service and "7" indicates "very high" level of service. After an extensive literature, they derived the dimensions as infrastructure, personnel quality, process of clinical care, administrative procedures, Safety measures corporate image, social responsibility, trustworthiness of the hospital in their instrument, which will help hospital administrators to understand their patients and their attendants perception about service quality.

HCSQM-12: AUTHOR: ZAIM, BAYYURT, ZAIM, 2010

RATERC

Figure 1: Model



52

The researchers examined the relationship between service quality and customer satisfaction in the hospital environment. In their study they measured customer satisfaction through three criteria such as future purchase intention, evaluation of overall service quality and how the customer see the overall service quality in the hospital by using the Carmen instrument to collect data. The instrument has six criteria's used as: tangibility, reliability, responsiveness, assurance, and empathy. The questionnaires were distributed to 400 patients in 12 hospitals out of which 265 were usable. They measured service quality using seven point likert scale, anchored at the numeral 1 indicated verbal statement "Strongly Disagree" and at the numeral 7 indicates the verbal statement "Strongly Agree", by differentiating perceived service and expected service. For the analysis the researchers used factor analysis and ordinal logistic regression technique to investigate the relationships among the variables. From the analysis they confirm tangibility, reliability, courtesy and empathy are responsible for customer satisfaction while the other two criteria's responsiveness and assurance are not responsible for customer satisfaction. Their suggestion includes, increasing the service quality in hospitals, physicians can concentrate on treatment leaving the administration in the hands of managers who have managerial skill and talent.

HCSQM-13: AUTHOR: SHABBIR, KAUFMANN, SHEHZAD, 2010

Service quality, Trust, Word of Mouth

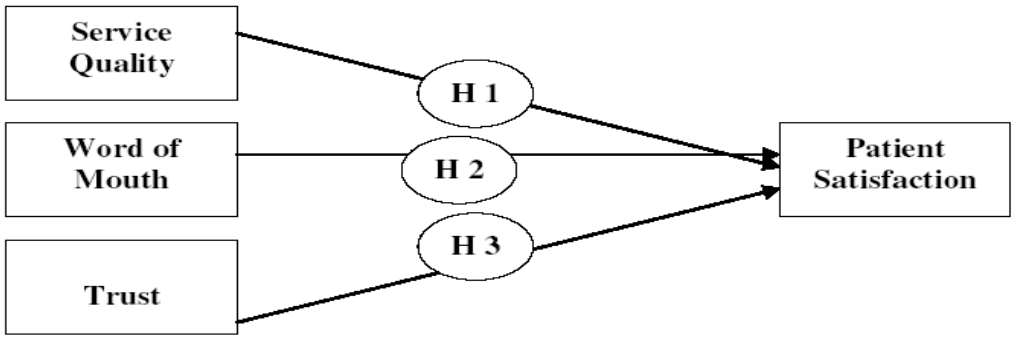


Figure 1. Theoretical framework.

The researchers derived a conceptual model of patient satisfaction and investigate attributes as service quality, trust and word of mouth on patient satisfaction. 186 samples were collected from public and private hospitals in Pakistan city. To construct the instrument 16 items service quality variables were taken from SERVQUAL (1985, 1988), for trust 5 items from Anderson & Dedrick (1990), 4 items for word of mouth, 5 items for patient satisfaction from Kavanaugh et.al.,(2006), using 5 point Likert scale (strongly disagree – strongly agree) numbered 1-5. In Pakistani hospitals patient's satisfaction was determined by the income level than any other demographics such as education level and age. Their results expressed that service quality is associated with the higher level of patient satisfaction, which is followed by trust. In service quality, discipline, had the greatest impact on customer satisfaction. They also studied that patient's perceived public hospital as superior in quality. They added that positive word of mouth does not influence the patient satisfaction, whereas service quality and trust are of greater importance. Significant contribution is given by the authors to identify the impact of word of mouth on satisfaction.

HCSQM-14: AUTHOR: CLARK, SAVITZ, 2010

Clinical excellence, service excellence, physician engagement, operational effectiveness, employee engagement, and community stewardship

EXHIBIT 1: Mission Critical Support for Performance Excellence

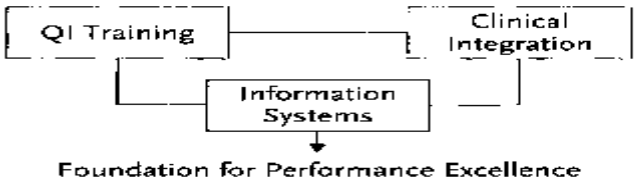
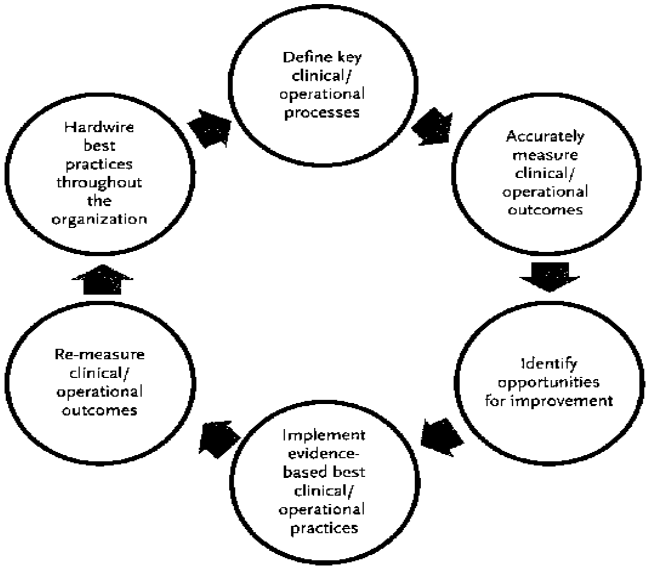


EXHIBIT 4: Applying Clinical Process Improvement to Operational Processes



DAVID D. CLARK, FACHE; LUCY A. SAVITZ; AND SCOTT B. PINGREE • 25

One of the key challenges in the service sector is low cost and high quality. This study provides a conceptual model to illustrate cost savings and the relative impact of hospital group versus payer benefit. Opportunities exist in many hospitals and health systems to consistently provide an extraordinary patient care experience while reducing operating costs. Extraordinary care is defined in six dimensions as clinical excellence, service excellence, physician engagement,

operational effectiveness, employee engagement, and community stewardship. Reliable clinical data, an activity based costing system, transparency, and accountability reporting are fundamental building blocks in the performance improvement process. For example, Medicare is raising the bar on quality and outcomes, essentially requiring more from providers while paying less. Finally they concluded that continuous organizational improvement processes need steady and consistent commitment to measure clinical and operational goals.

DISCUSSION

The growth of literature in the field of service quality seems to have developed sequentially, providing a continuous updation and learning from the finding / observations of predecessors and outcomes.

INSTRUMENT USED IN THE MODELS

There are researchers use SERVQUAL (Rohini and Mahadevappa, 2006; Shabbir et.al 2010) or modified SERVQUAL (Reidenbach and Smallwood, 1990, Kara et.al 2005, Zaim et.al 2010) instrument in healthcare setting. Carman, 1990 suggested that researchers should work with the original ten dimensions, rather than adopt the revised five-factor Parasuraman et.al (1998) model.

Majority of researchers goes beyond SERVQUAL, as they believe SERVQUAL is not a generic model for all industries (Ramsaran-Fowder, 2008). Haywood-Farmer and Stuart (1998) suggested that SERVQUAL was inappropriate for measuring professional service quality since it excluded "core service", "service customization" and "knowledge of the professional" dimensions. Apart from that, two administrators of the instrument cause boredom and confusion (Carman 1990, Buttle 1996). There is little evidence that customers assess service quality in terms of P-E gaps. Added to that SERVQUAL focuses on the process of service delivery, not the outcomes of the service encounter (Mangold and Babakus 1991, Buttle 1996)

These studies show that SERVQUAL does not cover all healthcare services dimensions that are important to patients. As health service is different from other service it has its own special dimensions. Because the whole focus of healthcare industry is patient's well-being (both physical and mental). Patients are usually in a physical or psychological discomfort when they consume health services (Padma et.al, 2009).

To overcome these limitations several authors developed their own framework to conceptualize and measure service quality in hospital services. In Indian context, there is a dearth of an independent model of service quality as almost all the existing studies applied SERVQUAL framework, except that of Duggirala et al, 2008; Padma et.al, 2009. They developed an instrument for measuring service quality from the patients' along with attendants and providers' perspectives.

SATISFACTION AND OUTCOME

Beyond these critiques service quality is one of a number of apparently interrelated constructs whose precise alignment has yet to be explored in terms of relationship between service quality, customer satisfaction, behavioral intention, purchase behavior, market share, word-of-mouth and customer retention (Buttle, 1996). Few researchers tried the above concepts in their healthcare service quality models (Reidenbach, Smallwood, 1990; Kara et.al, 2005; Zineldin, 2006; Dagger et.al, 2007; Padma et.al, 2009; Zaim et.al, 2010; Shabbir et.al, 2010).

Although the quality of products may some times be adequately measured by attributes, objective performance indicators, or adherence to manufacturing specifications, but the quality of service is adequately measured only by customer perceptions. This implies that customer satisfaction should receive considerable attention in service research. In line with, many researchers developed a model of perceived service quality and patient satisfaction. Cronin and Taylor (1992, p.65) observed that service quality is an antecedent of customer satisfaction, and has a significant impact on purchase intention. Dagger et.al, 2007; Steinke, 2008 further examined and proved the relationship of service quality as antecedents and mediator in their model. It is observed that dimensions such as intangibles (like human touch) have greater impact on service quality than tangibles (Kara, 2005).

ANTECEDENTS OF SERVICE QUALITY

Cronin and Taylor (1992, p.65) pointed out that consumers don't always buy best quality service they might instead purchase on the basis of their assessment of value of service. He found that customers evaluate service quality by reference to multiple encounters. In this study, researchers developed models incorporating patients perception of service quality with attendants (Padma et.al, 2009), physicians, experts (Licata et.al, 1995), CEO's **(**Marley et.al, 2004**)**, nurses (Steinke, 2008). This gives different perspective of service quality assessment in healthcare settings.

OBSERVATION OF MODEL

From this review, it is clear that there does not seem to be well-accepted conceptual model and measurement of health service quality. Another issue form the review is identification of different types of customers such as internal and external like patients, physician specialist, professional like doctors and nurses, other employees, and attendants. Professional like doctors, nurses and other employees are internal customers who should be dedicated when they provide service. Unless internal customers are satisfied, it may be difficult to visualize good quality service for the external customers.

At the same time the role and commitment of top management in delivering quality service to its customer also important in growing competitive pressure and globalization of services (Seth and Deshmuhk, 2005).

On the basis of the above review a gap is identified in this study which includes different perspective of precedents of service quality and outcomes of service quality.

REPRESENTATIVE ARTICLES

Model No	*Year*	*Author Name*	*Model Category/ Instrument*	*Approach*	*Impact variable*	*Research Issue*
HCSQM-1	1990	Reidenbach, Sandifer-smallwood	Modified SERVQUAL	Empirical-inpatient s, outpatients & emergency room services	"Patient Confident"	Understand the relationship among patients perceptions & willingness to recommend others
HCSQM-2	1995	Licata, Mowen, Gowtam	Marketing Lens Model	Empirical- physician, specialists & patients	Medical competence & Hospital characteristics	Identify the key stimuli in medical channel in similar lens
HCSQM-3	2004	Marley, Collier, Goldstein	Casual Model	Empirical hospital management like director / vice president of quality / quality manager	Leadership, Clinical & process quality	Focus on clinical & technical medical care
HCSQM-4	2005	Kara, Lonial, Tarim, Zaim	Modified SERVQUAL (RATERC)	Empirical- inpatients	Attitude & Behavior	Tangible & intangible determinants of service quality
HCSQM-5	2006	Zineldin	5Qs Model	Empirical- inpatients	Infrastructure, Atmosphere, Interaction	Factors affecting patients perception on satisfaction
HCSQM-6	2006	Bellou, Than Opoulos	OCB Model	Empirical – Doctors & Nurses	Organizational identification & OBSE	OCB impact on service quality
HCSQM-7	2007	Dagger, Sweeney, Johnson	Conceptual Model using multidimensional hierarchical scale	Empirical - Qualitative	Interpersonal, Environmental, Technical, Administrative quality	service quality impact on satisfaction & behavioral intentions
HCSQM-8	2007	Scotti, Harmon, Behson & Messina	Conceptual model	Empirical- patients	HPWS	Chain of events from employee perception to customer satisfaction
HCSQM-9	2008	Priporus, Laspa, Kamenidou	Satisfaction Model	Empirical- patients	Educational status & medical insurance type	Assess quality and patients characteristics on patient perception
HCSQM-10	2008	Steinke	Modified Service Profit chain model	Empirical - Nurses	Service quality, customer satisfaction & customer engagement	Focus on predictors of service climate on service quality
HCSQM-11	2009	Padma.P, Rajendiran.C, Prakash Sai.L	Conceptual framework	Conceptual – patients & attendants		Measure service quality
HCSQM-12	2010	Zaim, Bayyurt, Zaim	Modified SERVQUAL – Carmen instrument - RATERC	Empirical- patients	Tangibility, reliability courtesy & empathy	Examined relationship between service quality & satisfaction
HCSQM-13	2010	Shabbir, Kaufmann, Shehzad	Modified SERVQUAL	Empirical- patients	Service quality, trust, word of mouth	Service element on satisfaction
HCSQM-14	2010	Clark, Savitz	Performance excellence model	Conceptual	6 dimensions	Cost impact on quality

CONCLUSION

Nowadays, the trend in healthcare is to treat the patient as a client, which affects many issues (Priporus, Laspa, Kamenidou, 2008). This study shows how perceptions and evaluation of healthcare service quality change over time. In summary, as found in this literature review of models, hospital service quality is a multidimensional phenomenon. It clearly indicates that the variation in dimensions is all about the behavior of patients before and after consumption of service. The customer's expectations towards a particular service are also changing with respect to factors like time, increase in the number of encounters with a particular service, competitive environment, etc. These demands for a continuous effort to learn, modify the existing concepts of service quality (Seth and Deshmuhk, 2005).

Few studies have examined the impact of human factor such as employee's perception of service quality on patient satisfaction. Few other studies investigate the impact of patient's perception of service quality on satisfaction. Rarely there are authors studied the management perception of service quality which impact on satisfaction and the reflection of retention of customers in terms of profitability. No published studies that have empirically verified the entire chain of effects from organizational practices to service quality to customer satisfaction and behavioral intention in a healthcare setting.

It is noted that the models have a focus on only one link (i.e provider perception or employees including professional and expert's perception or patients and attendants perception). Here the gap in these models indicates the perception of human factor in three dimensions to measure the outcome of service quality. On the other side the researchers have continuously pointed out the positive correlation of internal service quality with business performance and service quality delivered to the customer (including distribution, marketing and other support functions) (Seth and Deshmuhk, 2005). The study suggest that the forthcoming research model of service quality in hospital should have three perceptions like managements, employees, patients and attendants perception and put together can measure the outcome of service quality. As identified a gap in the literature, the future researchers can work on this gap to fill it up.

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A I R E P: A NOVEL SCALED MULTIDIMENSIONAL QUANTITATIVE RULES GENERATION APPROACH

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ABSTRACT

This paper is aimed to propose an AIREP algorithm which uses association rule mining (ARM) discovery technique which is widely used in various data mining applications. The task of discovering scalable rules from the multidimensional database with reduced support is an area for exploration for research . In this paper we have proposed an algorithm AIREP to generate scaled rules using the pruning technique. The algorithm also prunes the database at each step in order to reduce the search space and to reduce the unnecessary frequent subset generation at each step. IREP induces a set of rules in disjunctive form growing and pruning phases and help in generating the scaled and efficient association rule. Experimental on real world datasets show that the proposed approach improves performance over existing approaches by minimizing the explosion of number of rules involving frequent items and without missing the frequent itemsets involving rare items.

KEYWORDS

Association rules, Data Mining algorithms, Frequent itemsets, Pre-pruning and Post-pruning.

INTRODUCTION

Due to increase in the amount of information available for analysis is increasing, scalability of data mining applications is becoming a critical factor. The scalability of data mining techniques is very important due to the rapid growth in the size of databases. Scalability in data mining can be done in large datasets by using scalable input /output architecture, minimizing transaction time. We can scale the data mining algorithms by using data reduction techniques such as aggregation, dimensional reduction, compression, and discretization. We can use reduce algorithm complexity by using parallelization methods (M.S.Danessh 2010, Jyothi Pillai 2010).

Data mining represents techniques for discovering knowledge patterns hidden in large databases (R Uday Kiran 2009). Data mining tasks can be classified into two categories, Descriptive Mining and Predictive Mining. The Descriptive Mining techniques such as Clustering, Association Rule Discovery, Sequential Pattern Discovery, is used to find human-interpretable patterns that describe the data. The Predictive Mining techniques like Classification, Regression, Deviation Detection, use some variables to predict unknown or future values of other variables (Jyoti Pillai 2010).

The discovery of association rules in transaction databases is an important data-mining problem because of its wide application in many areas, such as market basket analysis, decision support, financial forecast, collaborative recommendation, and prediction. For data mining approach, the association rule set is usually used for prediction. However, traditional association rule algorithms typically generate a large number of rules, most of which are unnecessary when used for prediction (Anurag Choubey 2011). The problem of mining association rules is to generate a set of potentially interesting association rules in a data set of sessions that have support higher than the specified minimum support threshold and assign an interestingness value to all rules based on an interestingness measure (Maja Dimitrij 2011) .

Association rules are an commonly used representation to describe the effective discovery of correlations among the underlying data in large databases. ..In this model, the set I = {il, i2 , . . . , im} is a collection of items or attributes. The database DB consists of a set of transactions, where each transaction is a subset of items in I. An association rule is an implication of the form X→Y with X, Y C I and X ∩ Y = 0. The meaning of the rule is that a transaction containing items in X will likely contain items in Y.(Neelu Khare 2009, Tarek F. Gharib 2010). To determine whether an association rule is interesting, two measures are used: support and confidence. An association rule, X→Y, has support s% in DB if s% of transactions in DB contains items in X U Y (C.S.Kanimozhi 2009). The same association rule is said to have confidence c% if among the transactions containing items in X, there are c% of them containing also items in Y. So, the problem is to find all association rules which satisfy predefined minimum support and minimum confidence constraints (S. Lofti 2009).

Many interesting and efficient algorithms have been proposed for mining association rules for these Boolean attributes, for examples, Apriori (R. Agrawal 1994), DHP (J S. Park 1995), and partition algorithms (A Savasere 1995). However, in a real database, attributes can be quantitative and the corresponding domains can have multiple values or a continuous range of values, for examples, age, and salary. A common approach to the QAR mining problem is to transform it into a problem of conventional BAR mining (R. Agrawal 1995 , Agrawal R 1993). Existing algorithms involve discretizing the domains of quantitative attributes into intervals so as to discover quantitative association rules. For each distinct value of a quantitative or categorical attribute, the pair <attribute, value> is mapped to a Boolean attribute and then algorithms for mining BARs are applied.

In many cases, the number of intervals associated with an attribute is large hence when we join the attributes in the mining process, the number of itemsets (i.e., a set of <attribute, interval> pairs) can become prohibitively large. As a result, effective techniques to prune the large search space of QAR mining and avoid the costly generation of a large number of candidate sets are necessary in order to develop an efficient algorithm for the problem. Also these intervals may not be meaningful enough for human experts to easily obtain nontrivial knowledge (Suraj Srivastava 2010).

We may be able to build a decision tree which perfectly reflects the data but the tree may not be generally applicable. Pruning is a technique for simplifying and hence generalising a decision tree. Error-Based Pruning replace sub-trees with leaves .It uses decision class is the majority. The pruning is based on predicted error rates. It prunes sub trees which result in lower predicted error rate (Fadi Thabtah 2006). The two common techniques are:

1) Cost Complexity Pruning: The predicted error rate modelled as weighted sum of complexity and error on training set and the test cases used to determine weighting .

2) Reduced Error Pruning: In this approach we use test set to assess error rate directly.

Pruning mechanisms are an important component of practical learning algorithms for decision trees and lists and are essential for learning comprehensible and accurate classifers in the presence of noise (Tzung-Pei Hong 2008).

This research work is the extension of the previous work where we have proposed algorithm for Aprori-UB which uses multidimensional access method UB-tree to generate better association rules with high support and confidence. The Aprori-Ub approach reduces not only the number of item sets generated but also the overall execution time of the algorithm. In this paper we have used the incremental reduced error pruning method to minimize the error during the generation of the scaled multidimensional association rule (Przemyslaw Kazienko 2009).

The rest of the paper is organized as follows. Section 2 gives the overview of the previous work done in the same field. Section 3 explains the concepts used in this paper. Section 4 gives the proposed work. Section 5 gives the experimentation details. Section 6 and Section 7 discusses the conclusion and future scope.

RELATED WORK

In the previous section we have introduced the basic concept of scalable Data Mining, Association Rule mining, Pruning. A brief overview of various algorithms, concepts and techniques defined in different research papers have been given in this section.

The popular approaches like Apriori discover association rules based on frequent itemsets which are extracted by fixing the same (or single) minimum support for all items (J.Shahrabi 2009). Let's start by defining association rule mining that finds correlation between the items in the data sets (] Michael Hahsler 2009, Laszlo Szathmary 2010). ARM is two step process i.e. first finds all frequent itemsets having minimum support and then generate strong association rules having minimum confidence, from the frequent itemsets. i.e. ARM finds out association rules which satisfy the predefined minimum support and confidence from a given database. Let J = {i1, i2…im} be a set of items, D be a set of database transactions and T is transaction contains set of items such that (. Mart´inez-Ballesterosa 2011). Let A, B be set of items and T is said to contain A, iff A⊂T. An association rule is an implication of the form A⇒B holds, where A⊂ J also B⊂J and A∩B is NULL. The rule holds in transactions set D with support s, where s is the percentage of both A and B. The A⇒B rule has confidence c in the transaction set D if c is the percentage of transactions in D containing A that also contains B (Rakhi Garg 2011).

Association analysis is an important data mining technique, widely used in commercial, financial, telecommunications, medical fields and so on, but rarely applied in the bibliometric analysis [12]. Our research shows that association rules can discover information hidden in the keywords, publications, authors, research institutions and other materials. In particular, it can instruct researchers to find research fields and techniques related to its research direction. At the same time, it helps them broaden research ideas and even discover new research fields by providing relevant publications, authors and research institutions. This has significant instructive value to research works.

CONCEPT USED

Associative algorithms normally derive a large set of rules since (R. Uday kiran 2009) classification data sets are typically highly correlated and (Anurag Choubey 2011) association rule mining approaches that consider all attribute values combinations in the database are used for rules discovery. As a result, there have been many attempts to reduce the size of their classifiers, mainly focused on preventing rules that are either redundant or misleading from taking any role in the prediction process of test data objects. The removal of such rules can make the classification process more effective and accurate (Fadi Thabtah 2006).

Several pruning methods have been used effectively to reduce the size of the classifiers, some of which have been adopted from decision trees, like pessimistic estimation, others from statistics such as chi-square testing (x^2). These pruning techniques are utilised during either rule discovery or the construction of the classifier. For instance, a very early pruning step, which eliminates rule items that do not pass the support threshold, may occur in the process of finding frequent rule items[3,2]. Another pruning such as chi-square testing may take place when generating the rules, and a late pruning method like database coverage may be used after discovering all potential rules.

There are various pruning methods used and each method is cast in the framework of the search in the state space (Floriana Esposito 1999) .Some of the pruning methods are :-

REDUCED ERROR PRUNING (REP)

This method uses the pruning set in order to evaluate the goodness of a sub tree of tree T_{ax}. Search is accomplished in the any-depth branch pruning state pace, Ẏp(T),{πT }) according to the first-better search strategy and a post-order traversal. The evaluation function f is defined as follows:

$$f(T) = -\sum_{t \in r} e(T)$$

where e(t) is the number of errors made by node t during the classification of the examples in the pruning set. The search in the space moves from a state ^{1} to a state $T^1 \in T`t(Ẏ_r)$ if the inequality

f(T`) >= f(T) holds or equivalently if

$$\sum_{t \in r} e(T) <= \sum e(T)$$

The states to be explored are generated according to the order defined by bottom-up methods, hence there is no choice of the best state to be reached, starting from another state (Kahayan Lal 2010).

PESSIMISTIC ERROR PRUNING

This pruning method, proposed in (Quinlan J.R 1987) as well, is characterized by the fact that it avoids using an independent pruning set. Search is accomplished in the any-depth branch pruning state space, ({Ẏp(T),{πT }), according to thefirst-better search strategy and a pre-order traversal. The evaluation function f is defined as follows:

f (t) = -∑n`t

t€ Ẏp where n`(t) = [e(t) + ½]and e(t) is the number of errors made by node t during the classification of the examples in the training set. Indeed, let T` be the arrival state of an edge out coming from T such that it is obtained by pruning a node t€T. Then it can be proved that f(T`) – f(T) = $n(T_t)$ – n1(t)

where $n(T_t) = -\sum e(s) + |ẎT_t|$. Pruning is accomplished also when the following condition holds: -SE(n`-$T_t$)) <= f(T`) – f(T).

where SE is the standard error. This is equivalent to prune when

as stated in Quinlan's original formulation. Therefore, there is no evaluation of the best pruning to perform among the possible ones, and the first pruning operation that turns out to be good is performed. It follows that the search strategy adopted is the first-better with a pre-order traversal (M. Mart´inez-Ballesterosa 2010, Maja Dimitrijevic 2011).

It should also be noted that the top-down approach to tree pruning used in PEP is not justified when there is no guarantee that all subtrees of a pruned branch T_t have to be pruned. Indeed, it may happen that by pruning a node t other nodes that should not be pruned according to the same criterion are actually discarded. However, this top-down approach gives the pruning method a high run-speed, with a computational complexity being linear in the number of nodes (Fang Li 2009, Preetham Kumar 2008).

MINIMUM ERROR PRUNING (MEP)

This method was proposed as a bottom-up approach for searching a single tree that minimizes the expected error rate. For a k-class problem, the expected probability that an observation reaching a node t belongs to the ith class is the following:

$$pi(t) = \frac{n_i(t) + p_{aim}}{N(t) + m}$$

where $n_i(t)$ is the number of training examples in t classified into the ith class, p_{ai} is the apriori probability of the ith class, m is a parameter of the estimate method, N(t) is the number of training examples reaching t. When a new observation reaching t is classified, the expected error rate is given by

$$EER = \min(i) \{1-p_i -(t)\}$$

In the MEP method, the choice of m is critical. We have to decide to choose the value m using an independent pruning set. More precisely, given a set of possible values for m, we select that returning the smallest tree with the lowest empirical error rate on an independent pruning set. Therefore, this is an example of two-phased pruning method (Pratima Gautam 2010).

CRITICAL VALUE PRUNING (CVP)

It is a pruning method that searches in the one-depth branch pruning state space, (**Ÿ**P(T),π). The evaluation function associated with this reduced space is given by the sum of the values taken by the selection measure in each internal node of the tree (f (T = 0) [17]. Therefore, if GR(t) is the gain ratio at node t, the evaluation function can be defined as $f(T) = \sum GR(T)/T_t$.A tree T` will be generated from a tree $^1$ if it happens that $f(T`) = \min f(T`)/t\pi_r$.

The search goes on according to a hill-climbing strategy until the minimum tree $T^1$is reached (Jianying Hu 2007).

At the end of the search, the number of the explored states will be $|\dot{Y}T_{max}|$, denoted as $T_{max}...T_{max-1}$. This method is two-phased as the previous one. However, in this case not all states traversed are considered in the second phase. A traversed state Ti, i<=1 <= $\dot{Y}_x$is considered to be transient if it happens that

$f(Tj)-f(T_{j-1}) >= f(Tj)-f(T_{j-1})$, j<=1.

For the second phase, we have to choose the best tree among the sequence of the pruned trees by measuring both the significance of the tree as a whole and its predictive ability. The significance of the tree is estimated by means of the G statistics, which evaluates the degree of interdependence between the leaves of a tree and the classes of the problem: It will be higher for fully expanded trees that correctly classify the whole set of examples. The weakness of this measure is that a test on this statistics is only able to establish whether the predictive ability of a tree is meaningful, but it cannot be used to choose among trees that pass the test (Maja Dimitrijevic 2011).

COST –COMPLEXITY PRUNING

This pruning method is characterized by two phases:

(1) Selection of a family of sub trees of T_{max} according to some heuristics.

(2) Choice of the best tree in the family according to an accurate estimate of the actual error rate.

For what concerns the first phase, search is performed in the any depth branch pruning state space according to a hill-climbing strategy and a post-order traversal. The evaluation function can be defined as follows: $f(T) = -\sum_{t \in \dot{Y}_r} e(T)$

where e(t) is the number of errors made by node t on the training, growing set. It is possible to move from T to T` =πr(t) if it happens that

$$\frac{f(T) - F(T`)}{|\dot{Y}_T| - |\dot{Y}_{T-1}|} = \frac{f(T) - F(T`)}{}$$

For each reached state, the next state that gives the lowest value of the ratio and apparent error rate increase on and number of leaves decrease is detected. The search goes on until the smallest tree $T_{1\,is}$ reached(E. Chandra 2010, Przemyslaw Kazienko 2009).

The second phase of the method aims at selecting the best among the trees traversed in the first phase. Once again, not all states are considered, and a transient state can be defined as follows: let

$T_{max} = T^{m,}\text{-}T^{m-1},....T_0...T_1...T_m$ be the states followed by the search process and let ^{T} the complexity parameter of a state T^i,T^m then it is transient if бi = бi-1 Jyothi Pillai 2010, Fan Lilin 2010).

PROPOSED WORK

We define ,C_k as a candidate itemset of size k ,Z_k as a frequent itemset of size k, An AIREP algorithm is

1. Find frequent set L_{k-1}
2. Join step: C_k is generated by joining L_{k-1} with itself (cartesian product L_{k-1} x L_{k-1})
3. Prune step : Use theIncremental Reduced Error pruning to generate scalable single rule.
4. Frequent set L_k has been achieved.

The proposed AIREP (Aprori Incremental Reduced Error Pruning) pseudo code:

```
AIREP (T, ų)
Z1 ← large multidimensional itemsets that appear in more than
Of large item set ų transactions
K ← 2
While ( Z_{k-1} ≠ 0 )
Ck ← Generate (Z_{k-1} ) // join and prune step
// using IREP
procedure I-REP (Examples, SplitRatio)
Theory = Θ ;
While Positive (Examples) ≠ Θ;
Clause = Θ;
Split Examples (Split Ratio, Examples, Growing Set, Pruning Set)
Cover = Growing Set
While Negative (Cover) ≠ Θ ;
Clause = Clause ∪ Find Literal (Clause; Cover)
Cover = Cover (Clause, Cover)
loop
NewClause = BestSimplification (Clause, PruningSet)
if Accuracy(NewClause,PruningSet) < Accuracy(Clause,PruningSet)
exit loop
Clause = NewClause
if Accuracy(Clause,PruningSet)<=Accuracy(fail,PruningSet)
exit while
Theory = Theory ∪ Clause
Examples = Examples -Cover
return (Theory)
```

```
// end of IREP
//frequent set generation
        for transaction t € Z
        Ck ← Subset(Ck,t)
        for candidates c € Ct
                count[c] =count[c + 1]
        Zk ← { c € Ck| count[c] >= e}
k ← k+1
return Zk
```

FIGURE 1: PSEUDOCODE OF PROPOSED AIREP ALGORITHM

The basic idea of Incremental Reduced Error Pruning (IREP) is that instead of first growing a complete concept description and pruning it thereafter, each individual clause will be pruned right after it has been generated. This ensures that the algorithm can remove the training examples that are covered by the pruned clause before subsequent clauses are learned thereby preventing these examples from influencing the learning of subsequent clauses.

Figure 1 shows pseudo-code for this algorithm. As usual, the current set of training examples is split into a growing (usually 2/3) and a pruning set (usually 1/3). However, not an entire theory, but only one clause is learned from the growing set. Then, literals are deleted from this clause in a greedy fashion until any further deletion would decrease the accuracy of this clause on the pruning set. Single pruning steps can be performed by submitting a one-clause theory to the same BestSimplification subroutine used in REP or, as in our implementation, one can use a more complex pruning operator that considers every literal in a clause for pruning. The best rule found by repeatedly pruning the original clause is added to the concept description and all covered positive and negative examples are removed from the training growing *and* pruning set. The remaining training instances are then redistributed into a new growing and a new pruning set to ensure that each of the two sets contains the predefined percentage of the remaining examples. From these sets the next clause is learned. When the predictive accuracy of the pruned clause is below the predictive accuracy of the empty clause (i.e., the clause with the body fail), the clause is not added to the concept description and I-REP returns the learned clauses. Thus,

the accuracy of the pruned clauses on the pruning set also serves as a stopping criterion. Post-pruning methods are used as pre-pruning heuristics.

In figure 2 the attributes of the dataset are divided into instances and converted into divided attributes. In order to build a rule, IREP uses the following strategy. First the uncovered examples are randomly partitioned into two subsets, a growing set and a pruning set. Next, a rule is grown. It begins with an empty conjunction of conditions, and considers adding to this any condition of the form $Z_n = U_i$, $Z_n <= \Theta$ or $Z >= \Theta$ where Z_n is a nominal attribute and u is a legal value for Z_n , or Z_c is a continuous variable and Θ is some value for Z_c that occurs in the training data. After growing a rule, the rule is immediately pruned. After growing a rule, the rule is immediately pruned To prune a rule, our implementation considers deleting any final sequence of conditions from the rule and chooses the deletion that maximizes the function

$$u(\text{Rule},\text{PrunePos},\text{PruneNeg}) = \frac{X + (N - n)}{X + N}$$

where X (respectively N), is the total number of examples in PrunePos ,PruneNeg and p ,n, is the number of examples in PrunePos ,PruneNeg covered by Rule.This process is repeated until no deletion improves the value of u.

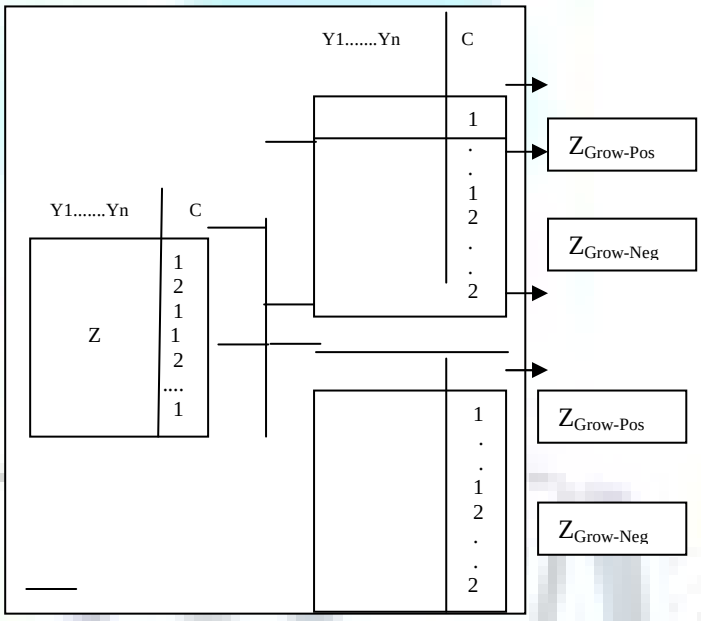
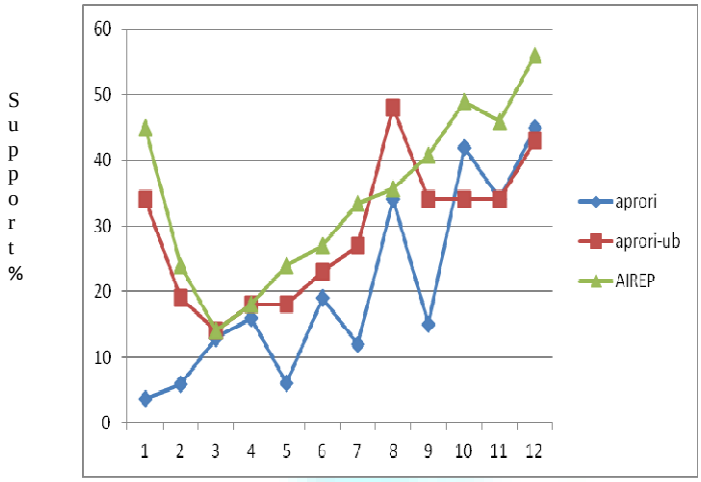


FIGURE 2: PARTITIONING OF ORIGINAL DATA SET OF LABELLED INSTANCES

EXPERIMENTATION

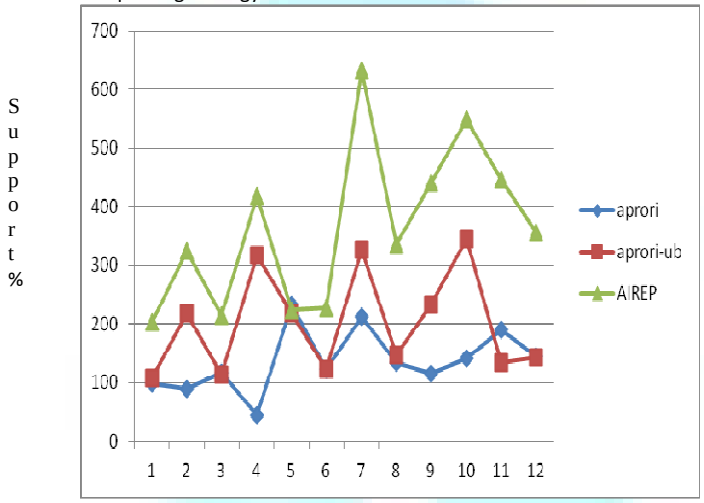
The experiments with proposed AIREP showed that the rules generated were fast and efficient. We used java programming language to implement the AIREP algorithm. We used the synthetic and real world dataset to test the efficiency of the algorithm. The experiment were conducted on breast-cancer real life dataset and other synthetic dataset .The dataset is belongs to UCI Machine repository datasets.The features of the dataset is computed from a digitized image of a fine needle aspirate (FNA) of a breast mass. The attributes of the dataset includes ID number, Diagnosis, radius, texture, area, smoothness.



Items sorted based on support.

FIGURE 3: SUPPORT% OF REAL WORLD DATASET USING AIREP

AIREP learns the clauses in the order in which they will be used by a PROLOG interpreter. Before subsequent rules are learned, each clause is completed (learned *and* pruned) and all covered examples are removed. Therefore, the AIREP approach eliminates the problem of incompatibility between the separate-and conquer learning strategy and the reduced-error pruning strategy.



Item sorted based on support

FIGURE 4: SUPPORT% OF SYNTHETIC WORLD DATASET USING AIREP

The experiment show that AIREP's asymptotic complexity is $O(n \log 2\ n)$, n being the size of the training set. The cost of growing one clause in REP is$O(n \log n)$, because for selecting each of the £(log n) literals. Thus, a constant number of conditions is tested against $O(n)$ examples. AIREP considers *every* literal in the clause for pruning. Therefore, each of the £(log n) literals has to be evaluated on the £(n) examples in the pruning set until the final clause has been found, i.e., at most $O(\log n)$ times. Thus, the cost of pruning one clause is $O(n \log 2\ n)$. Assuming that AIREP stops when the correct theory of constant size has been found, the overall cost is also $O(n \log 2\ n)$. This is significantly lower than the cost of growing an over fitting theory which has been shown to be -($n2 \log n$) under the same assumptions .

No.	Label	Count
1	10-19	0
2	20-29	1
3	30-39	36
4	40-49	90
5	50-59	96
6	60-69	57
7	70-79	6
8	80-89	0
9	90-99	0

TABLE 5: SUPPORT COUNT OF THE ATTRIBUTES OF DATASET

We tested our proposed method that contained a wide range of item numbers (more than 900 items) in a transaction, to find only multi dimensional quantitative association rules. To use data, we appended the two attribute fields namely tumor size and age using data generating programs based on randomization functions, in order to ensure that the final test data remained unbiased. The data contained 49,100 transactions. The number of rules obtained under different values of constraints, such as minimum support and minimum size of item-sets generated scaled association rules.

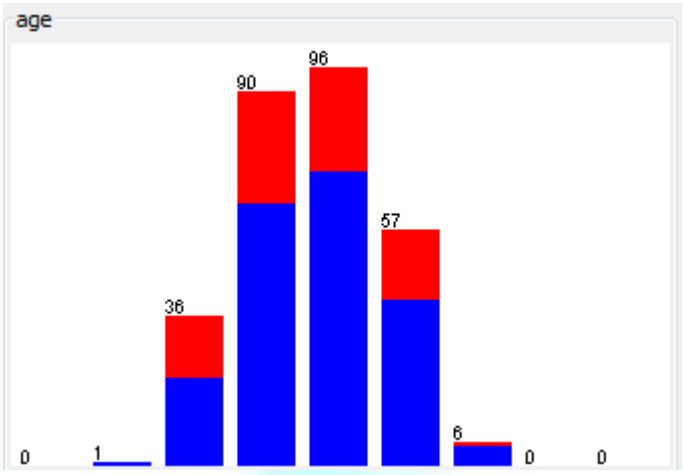


FIGURE 6: AGE ATTRIBUTE RULE GENERATION OF BREAST-CANCER DATASET

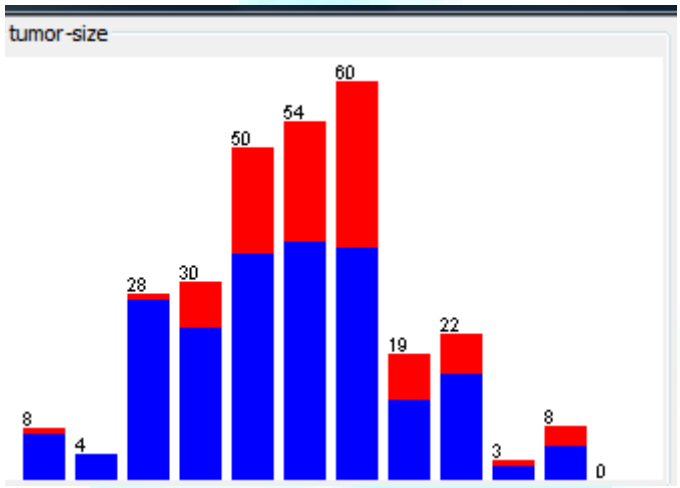


FIGURE 7: TUMOR-SIZE ATTRIBUTE RULE GENERATION OF BREAST-CANCER DATASET

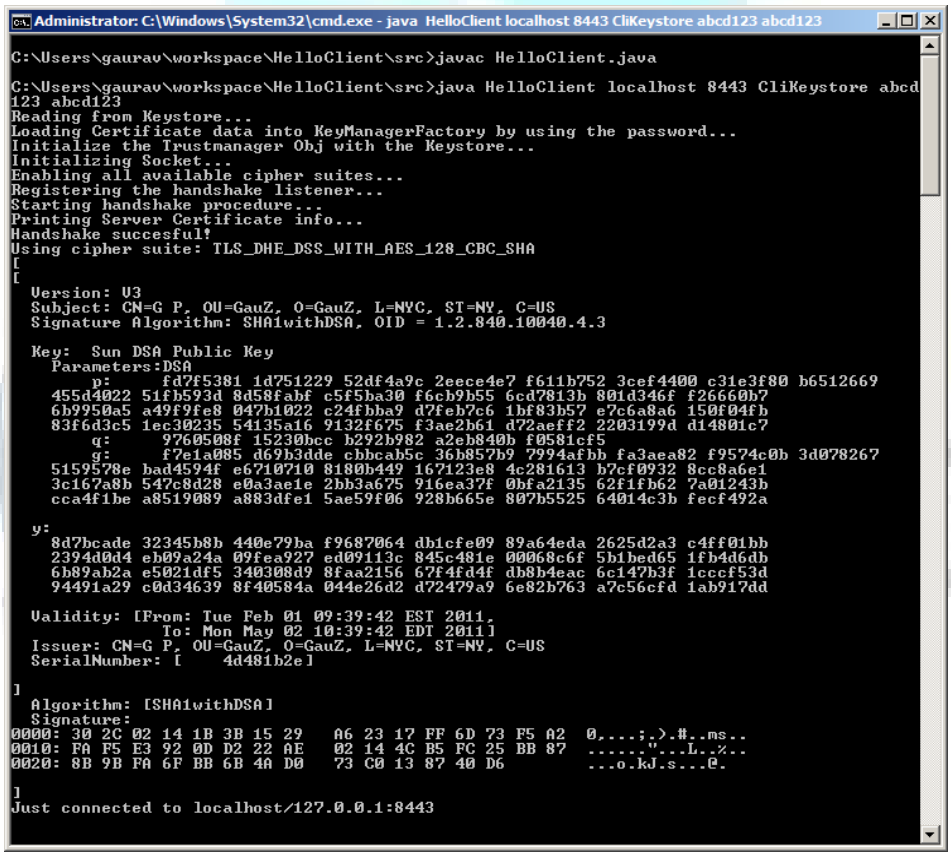


FIGURE 8: RULE GENERATION AFTER PRUNING

The efficiency increases with an increase in minsupport because an itemset now needs to be present in a larger number of transactions to eventually make it to the large set. The candidate set contains itemsets expected to be large as well as those expected to be small.

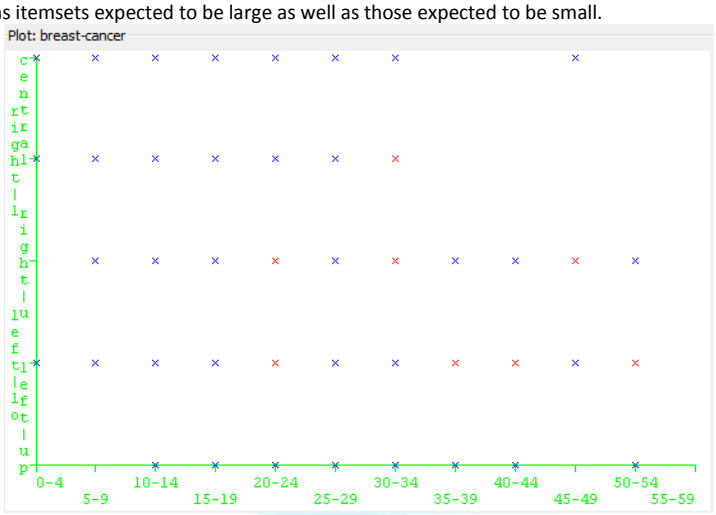


FIGURE 9: COMPARISON OF BREAST-CANCER DATASET ATTRIBUTES

Scaled Figure 8 bears out that most of the candidate itemsets expected to be large indeed turn out to be large. Initially, there is a large increase in the fraction of itemsets expected to be small in the candidate set as minsupport increases. Candidate itemsets as minsupport increases. Figure 7,8 shows efficiency of the pruning function optimization, with the remaining tuple optimization turned . It plots the fraction of new itemsets pruned due to this optimization .Figure 9 shows the results of the rule generated after pruning. The effectiveness of the optimization increases with an increase in minsupport as we can use a smaller value for. We also measured the pruning of new and old item sets when both the remaining tuple and pruning function optimizations were turned on. The curves for combined pruning tracked closely the two curves for the remaining tuple optimization. The pruning function optimization does not prune old candidate itemsets. The scaled rules obtained were classified on the basis of the attributes such as and generated with high confidence and support.

CONCLUSION

The goal of mining association rules is to discover important associations among items in a database of transactions such that the presence of some items will imply the presence of other items. The problem of mining association rules has been decomposed into two sub-problems: discovering the large Item-sets, and then generate rules based on these large Item-sets. The attention has been placed on the first sub-problem since the second sub-problem is quite straightforward up to some extent. Thus, there have been several algorithms proposed to solve the first sub-problem. These researches in algorithms of mining association rules are basically motivated by the fact that the amount of the processed data in mining association rules is huge; thus it is crucial to devise efficient algorithms to conduct mining on such data. The rules that we discover have one item in the consequent and a union of any number of items in the antecedent. We tested the effectiveness of our algorithm by applying it to sales data obtained from a large retailing company. For this data set, the algorithm exhibited excellent performance. The estimation procedure exhibited high accuracy and the pruning techniques were able to prune out a very large fraction of itemsets without measuring them.

FUTURE WORK

As a part of future work, we are going to investigate appropriate methodology for assigning confidence values in a dynamic manner to generate rare association rules in an efficient manner.

The existing approaches extract frequent item sets involving rare items by assigning minimum support to each item and employing an iterative process to discover frequent item sets. We are going to investigate how popular noniterative approaches like frequent-pattern growth approaches can be extended to assign minimum support to each item to extract frequent itemsets involving rare items. In future we discuss and propose a method to generate conditional hybrid dimension association rules using fuzzy logic, whereas hybrid dimension association rule is hybridization between inter-dimension and intra-dimension scaled association rules.

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AN ANALYSIS OF ONLINE IDENTITY MANAGEMENT TECHNIQUES

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ABSTRACT

Internet was originally designed to be used within a close community where the identity of users was well known and pre-established. Hence the need for managing the identity of individuals was not there. The modernisation and advancement of technology in the internet environment has resulted in the digitisation of personal information which has changed the ways of identifying persons and managing relations with them. In the present times identity on the internet has become virtual and is represented merely by a user account on a website or an email address or a mobile phone number etc. As the number of users on the internet grows so are the possibilities of misusing these identities by others. The existing identity management mechanisms need to be reworked in the light of the current scenario. This paper presents the different forms of Identity Management techniques which are being used in the online environment to prevent the loss of trust and to provide a sense of safety, security & certainty to Netizens about the identity of their communicating partners in the cyber space.

KEYWORDS
Identity Management, Internet Security, Privacy.

INTRODUCTION

During the first twenty years of its existence, the World Wide Web had a profound effect on us. While the Internet has been with us for more than 40 years, the Web is responsible for its exponential growth with more than 2 billion users worldwide accessing more than 22 billion web pages [1]. Social Networks like Facebook and Twitter are attracting more and more users. There is much more to come such as Cloud Computing which will increase the information processing and data exchange manifolds.

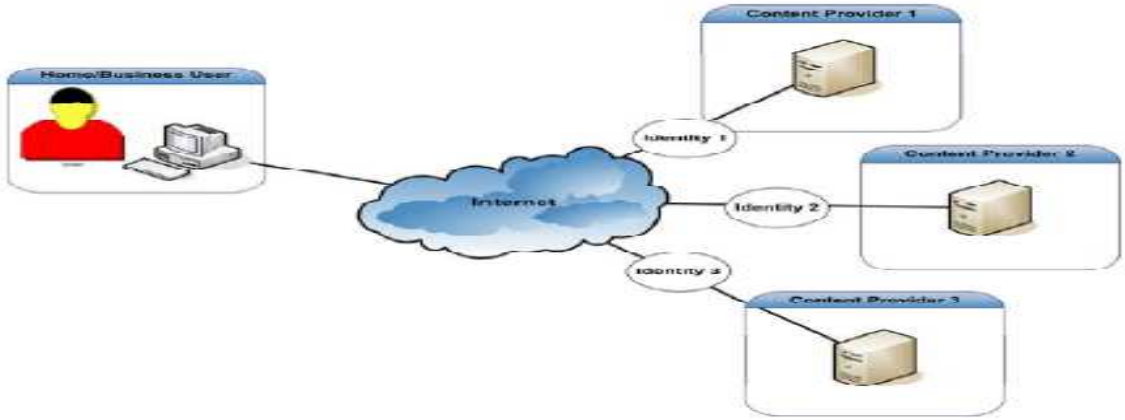
However, while looking at this amazing new world and getting excited by the use of previously unimagined devices, people are confused and concerned by the ease with which our data can be stolen, our profiles used for commercial purposes without our consent, our identity stolen or our privacy invaded. The trustworthiness of our digitized world is at stake.

The identity revolution is already becoming part of our daily lives. People are eager to share information with their "friends" in social networks like Facebook, in chat rooms, or in Second Life. Customers take advantage of the numerous bonus cards that are made available. Video surveillance is becoming the rule. In several countries, traditional ID documents are being replaced by biometric passports with RFID technologies. This raises several privacy issues and might actually even result in changing the perception of the concept of privacy itself, in particular by the younger generation. In the information society, our (partial) identities become the illusionary masks that we choose –or that we are assigned– to interplay and communicate with each other. Rights, obligations, responsibilities, even reputation are increasingly associated with these masks. On one hand, these masks become the key to access restricted information and to use services. On the other hand, in case of a fraud or negative reputation, the owner of such a mask can't be penalized: doors remain closed, access to services is denied. Hence the current preoccupying growth of impersonation, identity-theft and other identity-related crimes is seen.

ONLINE IDENTITY

An Online Identity or Internet Identity is a social identity that an Internet user establishes online in online communities, with other people and web sites. As depicted in Fig. 1, Identity Management on the internet today is disorganized. There are two basic reasons for this. First the content providers and the internet users continue to use identity management tools and techniques that worked well with hard wired networks but on Internet, which is a global network, these tools and techniques do not wok the same way as the netizens activities are context based. The Identity information needed by each content provider depends upon the perceived needs of the provider and the types of services or contents delivered. This leads to the second reason-Lack of uniformity in how the content providers implement Identity Management. Since approaches to Identity management are based on requirements as viewed by each individual content provider, the Internet is becoming a disorganized, unmanageable, insecure computing environment.

FIG.1: IDENTITY MANAGEMENT ON THE INTERNET TODAY [2]



Each content provider that requires information about the incoming user collects data and stores it for future use. User IDs and passwords might be different as the user moves from site to site. Because users have been trained to provide their information whenever an apparent content provider requests it, phishing attacks often successfully encourage users to provide personal information to Internet criminals. Short of criminal activity, content providers might also distribute personal information without the owner's knowledge or consent.

To summarize the current state of the Internet according to Cameron [2],

1. There's no way to know who and what you're connecting to
2. There's no way to evaluate the authenticity of sites visited
3. There's no way of knowing when information is disclosed to illegitimate partners

THE SEVEN LAWS OF IDENTITY

Kim Cameron, Identity and Access Architect of Microsoft Corporation laid out seven Laws of Identity in his paper, "The Laws of Identity," [2].

1. Technical identity systems must only reveal information identifying a user with the user's consent.
2. The solution that discloses the least amount of identifying information and best limits its use is the most stable long term solution.
3. Digital identity systems must be designed so the disclosure of identifying information is limited to parties having a necessary and justifiable place in a given identity relationship.
4. A universal identity system must support both "omni-directional" identifiers for use by public entities and "unidirectional" identifiers for use by private entities, thus facilitating discovery while preventing unnecessary release of correlation handles.
5. A universal identity system must channel and enable the inter-working of multiple identity technologies run by multiple identity providers.
6. The universal identity metasystem must define the human user to be a component of the distributed system integrated through unambiguous human-machine communication mechanisms offering protection against identity attacks.
7. The unifying identity meta-system must guarantee its users a simple, consistent experience while enabling separation of contexts through multiple operators and technologies.

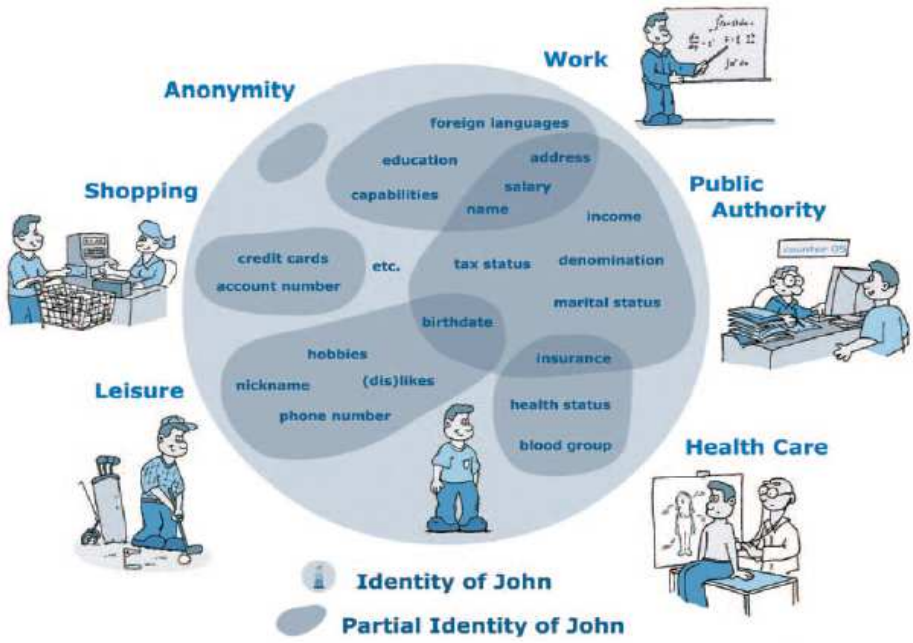
To summarize the laws, digital identity is based on context. Because of the number of content providers, there are thousands of contextual variations. A solution is required that allows users to traverse these variations with a simple identity system within which they maintain complete control of their personal information. They must also have adequate assurance that they are not victims of online criminal activities.

OVERVIEW ON IDM SYSTEMS

In the digital world a person can be represented by sets of data (attributes) which can be managed by technical means also called digital identities. Depending upon the situation and the context only subsets of these attributes are needed to represent a person both in the physical and the digital worlds which are called (Digital) Partial Identities [3]. An IDM system provides the tools for managing these partial identities in the digital world. A person uses different partial identities for work, for leisure activities or for dealing with a bank or an online store [3].

Some partial identities containing the information which other communication partners typically know about a person are shown in Fig. 2.

FIG.2: PARTIAL IDENTITIES [3]



TYPES OF IDM SYSTEMS

According to the EU project of FIDIS [4] there are three types of IDM systems.

Identity Management Systems for account management, especially implementing an AAA infrastructure (authentication, authorization and accounting).

Identity management Systems for profiling user data by an organization, for e.g. data warehouses which support personalized services or the analysis of customer behavior.

Identity management Systems for user–controlled context dependent role and pseudonym management.

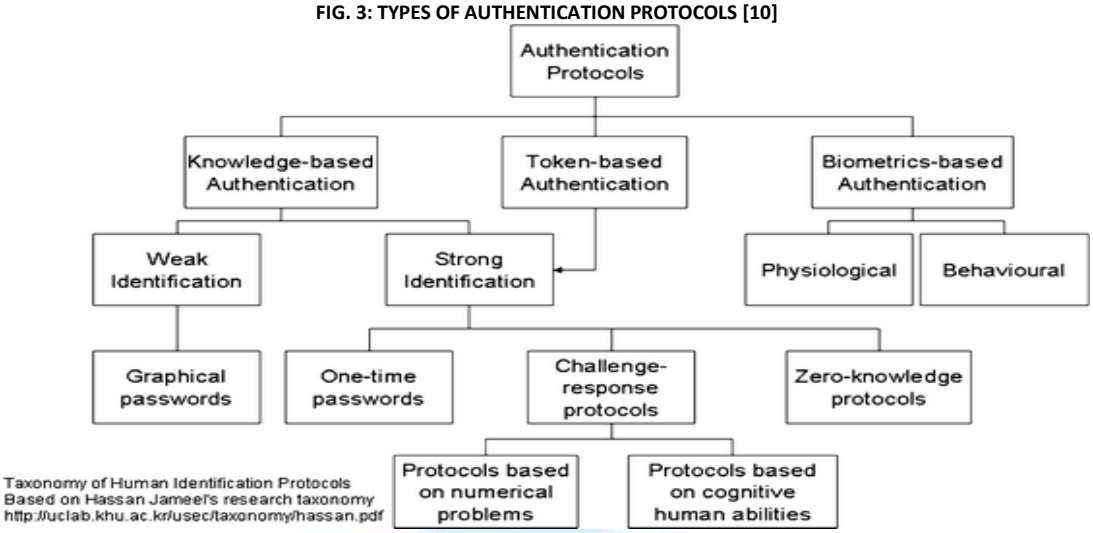
Centralized Identity Management Systems

Identity management systems of the first two types above are implemented in a centralized way. The main goal of their usage is reliable identification of persons or reliable assignment of attributes to a person while the second goal of identity management systems, the controlled pseudonymity, is neglected. They store all personal data related to partial identities on the server side. The most simple form is a stand-alone system with only one partial-identity-database and usable at this server and for the applications provided to users. This simple approach of federated identity management became of great interest during the last years because it allows users to manage partial identities for different applications and with different communication partners. It has the following features:-

1. Identity Provisioning: Based on one single registration at one service or so-called identity provider different services at different servers can create user accounts for partial identities of the identity this registration is associated with.

2. Single-Sign-On: Based on the login to one user account at one service a user is able to use his user accounts at different services.
3. Attribute exchange: The linkability of attributes to a partial identity at one service can be exchanged with other services. The different types of centralized IDM systems as presented by Jameel are depicted in Fig. 3.

FIG. 3: TYPES OF AUTHENTICATION PROTOCOLS [10]



Decentralized Identity Management

Type 3 Identity management Systems are organized in a decentralized, user-oriented way and try to reach both aspects of identity management, controlled pseudonymity and reliability of users. This section gives an overview in basic principles and techniques used. Personal data is initially stored under the control of the user. Then, the user can decide, whether, to whom and for which purpose he wants to disclose personal data. This requires a network capable of keeping communication partners anonymous. Further, pseudonyms must be used in order to control linkability of personal data disclosed. In order to not only preserve privacy as much as possible, but also enable personal data to be certified by third parties, an additional infrastructure is needed.

In the user controlled identity management, the user manages his/her partial identities according to specific situations and contexts. This means choosing and developing appropriate partial identities with respect to the current application needs. They enable the users to handle the plurality of accounts and passwords. Not always the real name of the user is required .Instead; different pseudonyms could be used to prevent undesired context-spanning linkage and profiling by other parties. User-controlled identity management systems do not only offer pseudonyms, but also keep track of which personal data have been disclosed to whom.[4] Thus, the user can see which personal information the various communication partners have received in earlier transactions. To know who knows what about oneself is necessary for one's informational privacy. At present, only very few people have a look at the privacy policies of online shops even though they contain important information, namely how the provider promises to treat the personal users' data, e.g., for which purpose data are stored or when they will be deleted. The identity management system could analyze them and show the user what is essential for her privacy rights. The user could decide on the basis of this information whether to give consent for data processing, which data to disclose or whether to refrain from interacting with the site at all. Even more sophisticated requirements may be negotiated, e.g., how long the data may be stored, which third parties may get access to personal data for specific purposes, or that the data may only be used if the provider pays for that. The privacy policies would be stored together with the information on disclosed data, like keeping a copy of the general terms and conditions. In several cases the application requirements will not offer many degrees of freedom, so that the users' choices are limited, e.g., in e-government applications. Then the identity management system is still useful to visualize the requirements and to keep track of the data disclosure to enable maximum transparency to the user.

THE CURRENT SCENARIO

There are quite a lot identity management systems which support the users' convenience, e.g., for password management and form filling. . The users should be aware of those systems which "manage the identity" on centralized servers: Those providers can monitor all the users' activities and may have their own interests regarding the data. More and more concepts for identity management are being implemented, e.g., by the Liberty Alliance [9], by Microsoft's CardSpace [7] or by the open source project Higgins [8]. All these approaches cover only a part of the functionality described above. In the EC-funded project "PRIME – Privacy and Identity Management for Europe" [5] the full flavors of identity management are being researched and developed [6]. As a specialty their approach uses "private credentials" which enable proving one's authorization without revealing information that may lead to an identification of the individual – as long as there is no misuse. In addition they are looking into ways for users to really exercise their privacy rights, e.g., to get access to check their personal data stored at other parties in the Internet or to withdraw their consent if they are not satisfied anymore with the site processing their data. By empowering the user and increasing transparency, which are the key issues of user-controlled identity management, not only the important right to privacy will be protected. but it can be developed further according to the needs of users of the Internet.

CONCLUSION

New Identity Management Systems should be developed with a strong interaction between social innovation and the development of policy and regulation. Uncontrolled technology development and innovation will lead the Internet and Web to become a jungle where trust is lost, crimes rise and each individual is forced to defend himself with limited tools. Similarly, policy development without awareness of technological developments will throttle innovation and economic growth. If netizens feel threatened, distrustful and hesitant towards new application and services on the Internet, everyone will end up being a loser. Each country should develop a techno-legal system for trust, security and privacy that should be agreeable to global cooperation and boost e-commerce.

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PAPR REDUCTION OF OFDM BASED ON ADAPTIVE ACTIVE CONSTELLATION EXTENSION

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ABSTRACT

One of the main disadvantages of Orthogonal Frequency Division Multiplexing (OFDM) is its high peak-to- average power ratio (PAPR). As the simplest approach to reducing the PAPR, Clipping based Active Constellation Extension (CB-ACE) exhibits good practicability, and the repeated clipping-and-filtering (RCF) algorithm proposed by Jean Armstrong provides a good performance in PAPR reduction and out-of-band power's filtering. However, its way of filtering in frequency-domain requires RCF operations to control the peak regrowth, which degrades the bit error rate (BER) performance and greatly increases the computational complexity. Therefore, this paper put forward a new method of utilizing Adaptive Active Constellation extension to reduce PAPR by controlling both clipping level and the convergence factor at each step and thereby minimize the peak power signal. The simulation results show that, this method can still limit the out-of-band power to meet the requirement of transmit spectrum mask specified in the IEEE802.11a standard. Moreover, it dramatically reduces the PAPR as well as provides lower BER and computational complexity.

KEYWORDS
CB-ACE, OFDM, PAPR, RCF.

INTRODUCTION

As a promising technique, OFDM has been widely used in many new and emerging broadband communication systems, such as digital audio broadcasting (DAB), high-definition television (HDTV), wireless local area network (IEEE 802.11a and HIPERLAN/2). However, as the OFDM signals are the sum of signals with random amplitude and phase, they are likely to have large PAPR that requires a linear high-power- amplifier (HPA) with an extremely high dynamic range, which is expensive and inefficient. Furthermore, any amplifier nonlinearity causes intermodulation products resulting in unwanted out-of-band power. A number of approaches have been proposed to deal with the PAPR problem, including clipping, clipping-and-filtering (CF), coding, companding transform, active constellation extension (ACE), selected mapping (SLM), partial transmit sequence (PTS), and so on [1]. Compared with other methods, clipping is the simplest and of good practicality. In particular, Jean Armstrong has proposed a RCF Algorithm which is also called Clipping Based Active Constellation Extension, which dramatically reduces the PAPR and limits the out-of band power to a low level , but excessively increases the computational complexity as well. Based on Jean Armstrong's method, this paper describes an improved approach which can provide good performance and lower complexity.

DEFINITION OF OFDM SIGNALS AND PAPR

In OFDM, a block of N symbols, {*Xk*, k=0, 1, … , N-1}, is formed with each symbol modulating one of a set of subcarriers, $\{f_n, n = 0, 1, \ldots\ldots, N-1\}$ with equal frequency separation 1/T, where T is the original symbol period. An inverse discrete Fourier transform (IDFT) can efficiently generate the multicarrier symbols. The IDFT of vector $X[k] = [X_0, X_1, \ldots\ldots X_{N-1}]$ results in T/N spaced discrete time signal $x[n] = [x_0, x_1, \ldots\ldots x_{N-1}]^*$. Thus, the transmitted signal is

$$x_n = \frac{1}{\sqrt{N}} \int_{k=0}^{\cdots} \exp j\frac{2\pi kn}{N} \qquad 0 \le k \le N-1 \qquad (1)$$

The PAPR of the transmitted signal can be written as

$$PAPR = \frac{\max_{0 \le n \le N-1} |x[n]|^2}{E\{|x_n|^2\}} \qquad (2)$$

The complementary cumulative distribution function (CCDF) is one of the most frequently used performance measures for PAPR reduction techniques, which denotes the probability that the PAPR of a data block exceeds a given threshold z. The CCDF of the PAPR of a data block of N symbols with Nyquist rate sampling is derived as

$$P(PAPR > z) = 1 - P(PAPR \le z) = 1 - (1 - e^{-z})^N \qquad (3)$$

THE CB-ACE ALGORITHM

The basic principle of Clipping-Based Active Constellation Extension (CB-ACE) algorithm involves switching between the time domain and the frequency domain. Filtering and applying the ACE constraint in the frequency domain, after clipping in the time domain, both require iterative processing to suppress the subsequent regrowth of the peak power [3].The CB-ACE algorithm is first used to clip the peak amplitude of the original Orthogonal Frequency Division Multiplexing (OFDM) signal. The clipping sample obtained after clipping the peak signals, denoted by $C_n^{(i)}$, is given by

$$C_n^{(i)} = \begin{cases} (|x_n^{(i)}| - A)e^{j\theta_n} & |x_n^{(i)}| > A \\ 0, & otherwise \end{cases} \qquad (4)$$

where $C_n^{(i)}$ is the Clipping sample of ith iteration, $x_n^{(i)}$ is the oversampled OFDM signal, A is predetermined clipping level. The equation (4) says that the clipping sample is reduced to a value equal to zero when the peak amplitude of the original OFDM signal is less than or equal to the predetermined clipping level, A. If the peak amplitude of the original OFDM signal is greater than the predetermined clipping level, then the clipping sample is given by $(|x_n^{(i)}| - A)e^{j\theta_n}$, where the predetermined clipping level is subtracted from the oversampled OFDM signal an is then multiplied by an exponential value [3]. The predetermined clipping level, denoted by A, is related to the target clipping ratio, γ and is given by the equation 5 [3].

$$\gamma = \frac{A^2}{E[|x_n|^2]} \quad (5)$$

Where, γ is the target clipping ratio and A is predetermined clipping level.The clipping of the peak signal results to distortion of the original OFDM signal, namely In-Band Distortion and Out-of-Band Distortion . [3], [4]. The in-band distortion results in the system performance degradation and cannot be reduced, while, the out-of-band distortion can be minimized by filtering the clipped signals. The signal obtained after filtering the clipped signal is given by [3].

$$x^{(i+1)} = x^i + \mu\tilde{e}^{(i)} \quad (6)$$

where , μ is positive real number (μ varies from 0.1 to 1) and $\tilde{e}^{(i)}$ is the anti-peak signal at the ith iteration given by'

$$\tilde{e}^{(i)} = T^{(i)}e^{(i)} \quad (7)$$

where , $T^{(i)}$ is transfer matrix at the ith iteration which is given by

$$T^{(i)} = \hat{Q}^{*(i)}\hat{Q}^{(i)} \quad (8)$$

where , $\hat{Q}^{*(i)}$ is conjugate of constellation order and $\hat{Q}^{(i)}$ is the constellation order

Though, the process of filtering completely eliminates the distortions caused by the clipping process, it introduces peak regrowth at some of the peak signals of the OFDM signal. The peak regrowth can be reduced by repeating the filtering process, which may again introduce some distortions. Therefore, the clipping and filtering processes are to be repeated until the peak signals are completely reduced. Hence, the Clipping-Based Active Constellation Extension (CB-ACE) Algorithm is also named as the Repeated Clipping and Filtering (RCF) process [3]

THE PROPOSED ALGORITHM

The main objective of the Adaptive Active Constellation Extension (Adaptive ACE) algorithm for reducing the Peak-to-Average Power Ratio (PAPR) is to control both the clipping level and the convergence factor at each step and thereby minimize the peak power signal whichever is greater than the initial target clipping level [3]. The Adaptive Active Constellation Extension (Adaptive ACE) algorithm can be initialized by selecting the parameters namely the target clipping level, denoted by A and the number of iterations, denoted by i. In the first step, the iteration is taken as two i.e., i = 2 and the initial target clipping level is to be taken as A [3]. The predetermined clipping level, denoted by A, is related to the target clipping ratio, γ and given is by the equation (5) [3].

$$\gamma = \frac{A^2}{E[|x_n|^2]} \quad (9)$$

where, γ is the target clipping ratio and A is predetermined clipping level .The clipping of the peak signal results to distortion of the original OFDM signal, namely In-Band Distortion and Out-of-Band Distortion . [3]. The in-band distortion results in the system performance degradation and cannot be reduced, while, the out-of-band distortion can be minimized by filtering the clipped signals. The signal obtained after filtering the clipped signal is given by [3].

$$x^{(i+1)} = x^i + \mu\tilde{e}^{(i)} \quad (10)$$

The Convergence Factor (CF), denoted by μ can be estimated by using the equation

$$\mu = \frac{R[(e^{(i)},\tilde{e}^{(i)})]}{(e^{(i)},\tilde{e}^{(i)})} \quad (11)$$

Where R is the real part, $e^{(i)}$ is the peak signal above the predetermined level, $\tilde{e}^{(i)}$ is the anti-peak signal at the ith iteration, $(.)$ is complex inner part. the anti-peak signal at the ith iteration given by

$$\tilde{e}^{(i)} = T^{(i)}e^{(i)} \quad (12)$$

where , $T^{(i)}$ is transfer matrix at the ith iteration which is given by

$$T^{(i)} = \hat{Q}^{*(i)}\hat{Q}^{(i)} \quad (13)$$

where , $\hat{Q}^{*(i)}$ is conjugate of constellation order and $\hat{Q}^{(i)}$ is the constellation order. The original Orthogonal Frequency Division Multiplexing (OFDM) signal, denoted by xn, is to be clipped in order to reduce the peak signals. The clipping signal is given by the equation

$$C_n^{(i)} = \begin{cases} (|x_n^{(i)}| - A)e^{j\theta_n}, & |x_n^{(i)}| > A \\ 0, & otherwise \end{cases} \quad (14)$$

where $C_n^{(i)}$ is the Clipping sample of ith iteration, $x_n^{(i)}$ is the oversampled OFDM signal, A is predetermined clipping level and for the next iteration is given by

$$A^{(i+1)} = A^{(i)} + \mu\nabla_A \quad (15)$$

where $A^{(i+1)}$ is the next iteration level, $A^{(i)}$ is the present iteration level , μ is the convergence factor and ∇_A is the gradient with respect to A which is given by

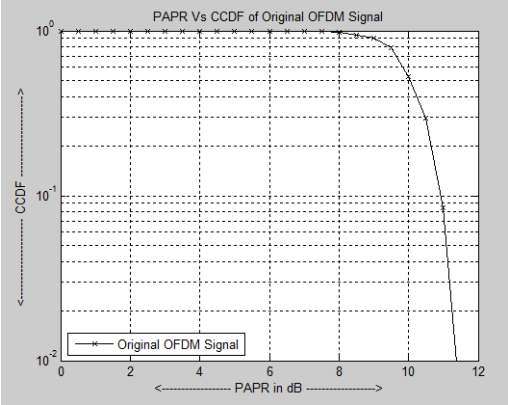
$$\nabla_A = \frac{\sum_{n=0}^{N_p} e_n^{(i)} C_n^{(i+1)}}{N_p} \quad (16)$$

where N_p is the number of peak samples larger than A. The Peak-to-Average Power Ratio (PAPR) is to be calculated to the signal obtained by the equation (10), which reduces the PAPR than the PAPR calculated for the original OFDM signal or PAPR obtained of the OFDM signal obtained by using the Clipping-Based Active Constellation Extension (CB-ACE) algorithm.

SIMULATION RESULTS

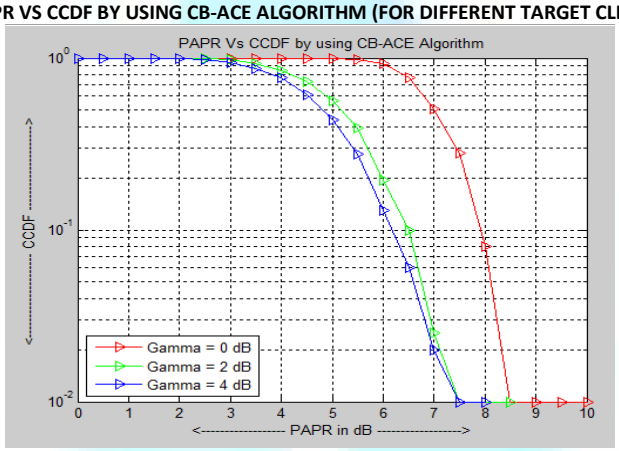
The Peak-to-Average Power Ratio (PAPR) of the original Orthogonal Frequency Division Multiplexing (OFDM) signal i.e., the PAPR is to be calculated by using the equations (1), (2) and (3). From the Figure 1, the Peak-to-Average Power Ratio (PAPR) of the original Orthogonal Frequency Division Multiplexing (OFDM) signal is equal to 11.8 dB with a Complimentary Cumulative Distribution Function (CCDF) of 10-2 or 0.01.The Peak-to-Average Power Ratio (PAPR) of the original Orthogonal Frequency Division Multiplexing (OFDM) signal is very high, which is evident from the Screen Shot 2.1. The high PAPR results to the increase in the complexity of the Analog-to-Digital Convertors (ADCs) and Digital-to-Analog Convertors (DACs), also reduces the efficiency of the power amplifiers.

FIGURE1 – PAPR VS CCDF OF ORIGINAL OFDM SIGNAL



The Peak-to-Average Power Ratio (PAPR) by the Clipping-Based Active Constellation Extension (CB-ACE) algorithm is to be calculated for the Orthogonal Frequency Division Multiplexing (OFDM) signal which is obtained after filtering the clipped signal i.e., the PAPR is to be calculated for the equation (5) by using the equations (1), (2) and (3). The Complimentary Cumulative Distribution Function (CCDF) by the Clipping-Based Active Constellation Extension (CB-ACE) algorithm is to be calculated for the Orthogonal Frequency Division Multiplexing (OFDM) signal which is obtained after filtering the clipped OFDM signal. From the Figure 2, the Peak-to-Average Power Ratio (PAPR) of the Orthogonal Frequency Division Multiplexing (OFDM) signal obtained by using the Clipping-Based Active Constellation Extension (CB-ACE) algorithm is equal to 10 dB, 8.5 dB and 8.0 dB for the target clipping ratios of 0 dB, 2 dB and 4 dB respectively with a Complimentary Cumulative Distribution Function (CCDF) of 10^{-2} or 0.01.

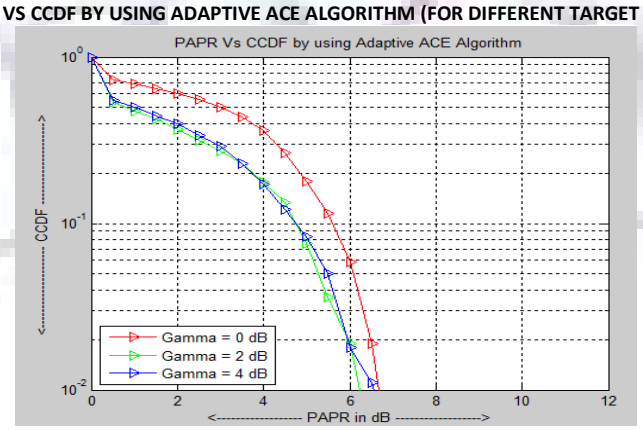
FIGURE 2 – PAPR VS CCDF BY USING CB-ACE ALGORITHM (FOR DIFFERENT TARGET CLIPPING RATIOS)



The Peak-to-Average Power Ratios is increasing as the target clipping ratios is decreasing i.e., minimum PAPR cannot be achieved, when the target clipping level is set below an initially unknown optimum value, which results to low clipping ratio problem.

The other problems faced by the Clipping-Based Active Constellation Extension (CB-ACE) algorithm are Out-of-Band Interference (OBI) and peak regrowth. Here, the Out-of-Band Interference (OBI) is a form of noise or an unwanted signal, which is caused when the original Orthogonal Frequency Division Multiplexing (OFDM) signal is clipped for reducing the peak signals which are outside to the predetermined area and the peak regrowth is obtained after filtering the clipped signal. The peak regrowth results to, increase in the computational time and computational complexity. To evaluate the performance of the proposed method we choose the software MATLAB completing the simulation based on Adaptive Active Constellation Extension (adaptive ACE) is to be calculated for the Orthogonal Frequency Division Multiplexing (OFDM) signal which is obtained after filtering the clipped signal i.e., PAPR is to be calculated for the equation (10) by using the equations (1), (2) and (3).

FIGURE 3 – PAPR VS CCDF BY USING ADAPTIVE ACE ALGORITHM (FOR DIFFERENT TARGET CLIPPING RATIOS)



From the figure 3, the Peak-to-Average Power Ratio (PAPR) of the Orthogonal Frequency Division Multiplexing (OFDM) signal obtained by using the Adaptive Active Constellation Extension (Adaptive ACE) algorithm is equal to 6.8 dB for all the target clipping ratios i.e., for γ = 0 dB or γ = 2 dB or γ = 4 dB with a Complimentary Cumulative Distribution Function (CCDF) of 10^{-2} or 0.01.

TABLE 5.1 – COMPARISON OF PAPR (IN DB) AND CCDF FOR DIFFERENT TECHNIQUES

Different Techniques	PAPR (in dB)	CCDF
Original OFDM Signal	11.8	10^{-2} or 0.01
Clipping-Based Active Constellation Extension (CB-ACE) Algorithm	10.0 (For γ = 0 dB) 8.5 (For γ = 2 dB) 8.0 ((For γ = 4 dB)	10^{-2} or 0.01
Adaptive Active Constellation Extension (Adaptive ACE) algorithm	6.8 (For γ = 0 dB, 2 db or 4 dB)	10^{-2} or 0.01

From the table 5.1, the Peak-to-Average Power Ratio of the Orthogonal Frequency Division Multiplexing systems is reduced or minimized by using the existing methods namely Clipping-Based Active Constellation Extension (CB-ACE) and the proposed method namely Adaptive Active Constellation Extension (Adaptive ACE) Algorithm at a Complimentary Cumulative Distribution Function of 10^{-2} or 0.01.

CONCLUSIONS

In this paper, we have proposed a new algorithm based on Adaptive Active Based Constellation Extention to reduce the PAPR of OFDM signal. Compared with the CB-ACE algorithm, this method can dramatically reduce the peak regrowth and the computational complexity by avoiding RCF operations. Moreover, it can still meet the requirement of transmit spectrum mask specified in the IEEE802.11a standard, and greatly improve the BER performance even when the initial target clipping ratio is set below the unknown optimum clipping point. Hence, the proposed algorithm avoids the problem of low clipping ratio, which is caused in the process of reducing the PAPR by using the Clipping-Based Active Constellation Extension (CB-ACE) Algorithm

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ANALYZING THE OUTPERFORMING SECTOR IN THE VOLATILE MARKET

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ABSTRACT

The world of business, economics and finance is rapidly changing. Trends in the economy affect businesses and the financial markets which in turn affect the economy. These days the global economy is highly integrated with economic and financial events in one country being quickly transmitted to other economies. The world economy is in recession. More or less every country is facing the problem of inflation and decrease in the rate of GDP resulting in the increased rate of unemployment and other related problems. The various investment avenues are Real state, White metal, Yellow metal, Shares, Mutual funds and Securities. The Indian economy is divided in to various sectors like FMCG, Automobile, Pharmaceutical, Banks etc. In the present context, it is very difficult for a lay investor to make the profits from the investment. The paper mainly focuses on finding out the outperforming sector. For this purpose we will collect data of BSE Sensex and its various sectors from 1st Jan 2011 to 30th Nov 2011.

KEYWORDS
Market Return [Rm], Shares, Portfolio, and Sector.

INTRODUCTION

Volatility refers to the amount of uncertainty or risk about the size of changes in a security's value. A higher volatility means that a security's value can potentially be spread out over a larger range of values. This means that the price of the security can change dramatically over a short time period in either direction. A lower volatility means that a security's value does not fluctuate dramatically, but changes in value at a steady pace.
It is common for discussions to talk about the volatility of a security's price, even while it is the returns' volatility that is being measured. It is used to quantify the risk of the financial instrument over the specified time period.

BOMBAY STOCK EXCHANGE

The Bombay Stock Exchange is the oldest stock exchange in Asia. It is located in the Dalal Street in Mumbai, India. This stock exchange was setup in the year 1875. Today it has around 3500 companies listed with the exchange and has the highest trading volume. Earlier the BSE was known as "The Native Share and Stock Brokers Association". The Bombay Stock Exchange is one of the biggest stock exchanges in the world. As per the results of October 2006, the capitalization is around 730 billion dollars. The Bombay Stock exchange was recognized by the Government of India in the year 1956 under the Securities and Exchange board of India.
The Bombay Stock Exchange is the oldest exchange in Asia. It traces its history to the 1850s, when four Gujarati and one Parsi stockbroker would gather under banyan trees in front of Mumbai's Town Hall. The location of these meetings changed many times, as the number of brokers constantly increased. The group eventually moved to Dalal Street in 1874 and in 1875 became an official organization known as 'The Native Share & Stock Brokers Association'. In 1956, the BSE became the first stock exchange to be recognized by the Indian Government under the Securities Contracts Regulation Act. The Bombay Stock Exchange developed the BSE SENSEX in 1986, giving the BSE a means to measure overall performance of the exchange. In 2000 the BSE used this index to open its derivatives market, trading SENSEX futures contracts. The development of SENSEX options along with equity derivatives followed in 2001 and 2002, expanding the BSE's trading platform. Historically an open outcry floor trading exchange, the Bombay Stock Exchange switched to an electronic trading system in 1995. It took the exchange only fifty days to make this transition. This automated, screen-based trading platform called BSE On-line trading (BOLT) currently has a capacity of 8 million orders per day. The BSE has also introduced the world's first centralized exchange-based internet trading system, BSEWEBx.co.in to enable investors anywhere in the world to trade on the BSE platform.
A stock market or equity market is a public market (a loose network of economic transactions, not a physical facility or discrete entity) for the trading of company stock and derivatives at an agreed price; these are securities listed on a stock exchange as well as those only traded privately.
The size of the world stock market was estimated at about $36.6 trillion US at the beginning of October 2008.The total world derivatives market has been estimated at about $791 trillion face or nominal value,11 times the size of the entire world economy.[The value of the derivatives market, because it is stated in terms of notional values, cannot be directly compared to a stock or a fixed income security, which traditionally refers to an actual value. Moreover, the vast majority of derivatives 'cancel' each other out (i.e., a derivative 'bet' on an event occurring is offset by a comparable derivative 'bet' on the event not occurring). Many such relatively illiquid securities are valued as marked to model, rather than an actual market price.
The stocks are listed and traded on stock exchanges which are entities of a corporation or mutual organization specialized in the business of bringing buyers and sellers of the organizations to a listing of stocks and securities together. The largest stock market in the United States, by market cap, is the New York Stock Exchange, NYSE. In Canada, the largest stock market is the Toronto Stock Exchange. Major European examples of stock exchanges include the London Stock Exchange, Paris Bourse, and the Deutsche Börse. Asian examples include the Tokyo Stock Exchange, the Hong Kong Stock Exchange, the Shanghai Stock Exchange, and the Bombay Stock Exchange. In Latin America, there are such exchanges as the BM&F Bovespa and the BMV.

RESEARCH OBJECTIVES

1. To study the returns & volatility of the market for the relevant period.
2. To study the sector wise performance for the relevant period.

3. To study the best sector and its returns.

HYPOTHESIS

H01: There is no significant difference between the returns of the market and the returns of the various sectors.
H02: There is no significant difference between the returns of various sectors.

RESEARCH METHODOLOGY

In this study researchers have used secondary data in the research. This is generally collected from various website, books, & magazines. The researchers have made limitation in the work up to ten leading sectors. All the data collected & incorporated in the study are related to FMCG, Automobile, Pharmaceutical, Banks etc. Researchers also incorporated monthly opening & closing value of BSE Sensex of relevant period. The nature of study is analytical & descriptive.

ANALYSIS OF MARKET RETURN (SENSEX)

TABLE 1.1

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	20,621.61	18,327.76	-2,293.85	-11.1235
February 2011	18425.18	17823.4	-601.78	-3.2661
March 2011	17,982.28	19,445.22	1,462.94	8.1355
April 2011	19463.11	19135.96	-327.15	-1.6809
May 2011	19224.05	18503.28	-720.77	-3.7493
June 2011	18527.12	18845.87	318.75	1.7205
July 2011	18974.96	18197.2	-777.76	-4.0989
August 2011	18,352.23	16,676.75	-1,675.48	-9.1296
September 2011	16963.67	16,453.76	-509.91	-3.0059
October 2011	16255.97	17,705.01	1,449.04	8.9139
November 2011	17540.55	16123.46	-1,417.09	-8.0789
		TOTAL	-5,093.06	-25.3633

After the analysis of above table, researchers have found that Sensex were 20621.61 in the month of January 2011 which is 16123.46 in the month of November 2011.It shows that there is a downfall 5093.06 points nearly (25.3633 %) in the period of the study.

Above table shows the declining trend of Sensex in the month of January, February, April, May, July, August, September and November 2011 but there were the positive trend in the month of March, June and October 2011.There was a surprisingly big change has been noted in the month of March and October 2011 which was positive .But in the month of January 2011, the Sensex has shown drastic negative change.

ANALYSIS OF VARIOUS SECTORS ON THE BASIS OF THEIR RETURNS

BANK

TABLE 1.2

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	13,457.99	12,064.01	-1,393.98	-10.3580
February 2011	12099.06	11840.34	-258.72	-2.1383
March 2011	11,927.11	13,299.77	1,372.66	11.5087
April 2011	13297.01	13076.97	-220.04	-1.6548
May 2011	13108.5	12543	-565.50	-4.3140
June 2011	12533.91	12821.05	287.14	2.2909
July 2011	12914.93	12447.83	-467.10	-3.6167
August 2011	12,553.13	10,904.24	-1,648.89	-13.1353
September 2011	11057.31	10,850.73	-206.58	-1.8683
October 2011	10739.2	11,454.03	714.83	6.6563
November 2011	11372.85	9850.43	-1,522.42	-13.3864
		TOTAL	-3,908.60	-30.0160

The opening index for Banking sector in January 2011 was 13457.99 which is 9850.43 in the month of November 2011 i.e. the index drops down by 3908.60 points nearly (30.0160 %).

The table shows that the maximum downfall in the relevant period is in August 2011 by 1648.89 points and maximum rise is in the month of March 2011 by 1372.66 points.

AUTO

TABLE 1.3

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	10,337.49	8,894.58	-1,442.91	-13.9580
February 2011	8955.48	8252.92	-702.56	-7.8450
March 2011	8,331.50	9,290.75	959.25	11.5135
April 2011	9286.58	9559.94	273.36	2.9436
May 2011	9606.66	8932.74	-673.92	-7.0151
June 2011	8953.29	8798.48	-154.81	-1.7291
July 2011	8825.71	8758.83	-66.88	-0.7578
August 2011	8,794.50	8,396.16	-398.34	-4.5294
September 2011	8445.1	8,498.42	53.32	0.6314
October 2011	8468.51	9,477.19	1,008.68	11.9110
November 2011	9403.41	8434.28	-969.13	-10.3062
		TOTAL	-2,113.94	-19.1412

The opening index for Auto sector in January 2011 is 10337.49 which is 8434.28 in the month of November 2011 i.e. the index drops down by 2113.94 points nearly (19.1412 %).

The table shows that the maximum downfall in the relevant period is in January 2011 by 1442.91 points and maximum rise is in the month of October 2011 by 1008.68 points.

IT

TABLE 1.4

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	6,831.74	6,371.10	-460.64	-6.7426
February 2011	6389.84	6106.81	-283.03	-4.4294
March 2011	6,148.03	6,548.10	400.07	6.5073
April 2011	6534.67	6144.39	-390.28	-5.9725
May 2011	6170.9	5994.41	-176.49	-2.8600
June 2011	5996.83	6100.3	103.47	1.7254
July 2011	6139.17	5835.44	-303.73	-4.9474
August 2011	5,859.27	5,061.83	-797.44	-13.6099
September 2011	5132.84	5,275.23	142.39	2.7741
October 2011	5194.91	5,828.26	633.35	12.1917
November 2011	5769.01	5499.09	-269.92	-4.6788
		TOTAL	-1,402.25	-20.0421

As per the above table the opening index for IT sector is 6831.74 in January 2011 which is 5499.09 in the month of November 2011 i.e. index falls by 1402.25 points nearly (20.0421 %).

The table reveals that the maximum gain to the sector was in the month of October 2011 of 633.35 points and the maximum loss was in the month of August 2011 of 794.44 points.

FMCG

TABLLE 1.5

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	3,701.64	3,366.20	-335.44	-9.0619
February 2011	3376.21	3432.42	56.21	1.6649
March 2011	3,455.73	3,596.10	140.37	4.0619
April 2011	3604.78	3755.16	150.38	4.1717
May 2011	3772.44	3858.14	85.70	2.2717
June 2011	3870.68	4045.42	174.74	4.5145
July 2011	4052.63	4093.12	40.49	0.9991
August 2011	4,112.60	3,949.57	-163.03	-3.9642
September 2011	4028.26	3,910.39	-117.87	-2.9261
October 2011	3888.03	4,196.59	308.56	7.9362
November 2011	4160.6	4040.82	-119.78	-2.8789
		TOTAL	220.33	6.7889

The opening index for FMCG sector in January 2011 was 3701.64 which is 4040.82in the month of November 2011 i.e. this sector has gain 220.33 points nearly 6.7889 %.

After analyzing the table it is found that the maximum loss to this sector is of 335.44 points in the month of January 2011 and the maximum gain is in October 2011 of 308.56.

METAL

TABLE 1.6

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	17,727.53	16,115.67	-1,611.86	-9.0924
February 2011	16176.11	15348.81	-827.30	-5.1143
March 2011	15,441.92	16,161.39	719.47	4.6592
April 2011	16188.76	16190.59	1.83	0.0113
May 2011	16254.95	15411.32	-843.63	-5.1900
June 2011	15471.61	15061.89	-409.72	-2.6482
July 2011	15172.71	14016.72	-1,155.99	-7.6189
August 2011	14,115.99	12,097.10	-2,018.89	-14.3021
September 2011	12217.27	10,995.57	-1,221.70	-9.9998
October 2011	10886.86	11,904.10	1,017.24	9.3437
November 2011	11802.85	10224.51	-1,578.34	-13.3725
		TOTAL	-7,928.89	-53.3240

The opening index for metal sector is 17727.53 in January 2011 which is 10224.51 in the month of November 2011 i.e. the index drop down by 7928.89 points nearly (53.3240 %).

The performance of metal sector shows that the maximum downfall in this sector is in the month of August 2011 of 2018.89 points and maximum gain is in the month of October 2011 of 1017.24.

OIL & GAS

TABLE 1.7

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	10,631.65	9,481.91	-1,149.74	-10.8143
February 2011	9554.95	9459.45	-95.50	-0.9995
March 2011	9,521.30	10,240.64	719.34	7.5551
April 2011	10244.74	10008.27	-236.47	-2.3082
May 2011	10025.88	9594.02	-431.86	-4.3075
June 2011	9593.48	9208.26	-385.22	-4.0154
July 2011	9304.28	8799.49	-504.79	-5.4254
August 2011	8,880.83	8,353.25	-527.58	-5.9407
September 2011	8492.48	8,494.45	1.97	0.0232
October 2011	8397.41	8,987.52	590.11	7.0273
November 2011	8915.54	8152.63	-762.91	-8.5571
		TOTAL	-2,782.65	-27.7624

The opening index for oil and gas sector is 10631.65 in January 2011 which is 8152.63 in November 2011 i.e. the index drop down by 2782.65 points nearly (27.7624%).

As per the above table the maximum loss to this sector is in January 2011 of 1149.74 points and the maximum gain is in the month of March 2011 of 719.34 points.

POWER

TABLE 1.8

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	2,994.15	2,744.20	-249.95	-8.3479
February 2011	2751.11	2523.29	-227.82	-8.2810
March 2011	2,536.98	2,712.11	175.13	6.9031
April 2011	2718.93	2662.95	-55.98	-2.0589
May 2011	2666.96	2555.82	-111.14	-4.1673
June 2011	2559.97	2612.01	52.04	2.0328
July 2011	2615.06	2455.87	-159.19	-6.0874
August 2011	2,463.35	2,232.64	-230.71	-9.3657
September 2011	2251.78	2,125.41	-126.37	-5.6120
October 2011	2104.56	2,205.11	100.55	4.7777
November 2011	2200.86	1936.39	-264.47	-12.0167
		TOTAL	-1,097.91	-42.2233

After analyzing the above table it is found that the opening index of power sector is 2994.15 in January 2011 which is 1936.39 in November 2011 i.e. the index drop down by 1097.91 points nearly (42.2233 %).

The maximum points gain by this sector is in the month of March 2011 of 175.13 points and the maximum loss in the month of November 2011 of 264.47 points.

CD (CONSUMER DURABLE)

TABLE 1.9

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	6,356.97	5,995.67	-361.30	-5.6835
February 2011	5995.67	5631.61	-364.06	-6.0720
March 2011	5,631.61	6,239.69	608.08	10.7976
April 2011	6239.69	6392.93	153.24	2.4559
May 2011	6392.93	6548.74	155.81	2.4372
June 2011	6548.74	6653.72	104.98	1.6031
July 2011	6653.72	6755.67	101.95	1.5322
August 2011	6,755.67	6,263.66	-492.01	-7.2829
September 2011	6263.63	6,361.41	97.78	1.5611
October 2011	6361.41	6,594.87	233.46	3.6699
November 2011	6594.87	5644.19	-950.68	-14.4154
		TOTAL	-712.75	-9.3969

The above table shows that the opening index for Consumer durable was 6,356.97 in the month of January 2011 which is 5644.19 in November 2011 i.e. this index drops down by 712.75 points which is near about (9.3969 %).The maximum gain to this sector is of 608.08 in the month of March 2011 and maximum loss is of 950.68 points in November 2011.

CG (CONSUMER GOODS)

TABLE 1.10

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	15,470.11	13,526.03	-1,944.08	-12.5667
February 2011	13591.71	12399.76	-1,191.95	-8.7697
March 2011	12,479.40	13,233.89	754.49	6.0459
April 2011	13312.52	13092.14	-220.38	-1.6554
May 2011	13136.98	13092.14	-44.84	-0.3413
June 2011	13095.14	13905.62	810.48	6.1892
July 2011	13992.8	12995.81	-996.99	-7.1250
August 2011	13,064.59	12,046.55	-1,018.04	-7.7924
September 2011	12169.09	10,742.97	-1,426.12	-11.7192
October 2011	10627.99	10,969.24	341.25	3.2109
November 2011	10895.08	9667.9	-1,227.18	-11.2636
		TOTAL	-6,163.36	-45.7874

The opening index of this sector was 15470.11 in the month of January 2011 which is 9667.9 in the month of November 2011 i.e. the index falls by 6163.36 points which is nearly (45.7874%).

The table reveals that this sector has outperformed in the month of October 2011 by gaining 341.25 points and the maximum loss of this sector is in the month of January 2011 of 1944.08 points.

PSU (PUBLIC SECTOR UNDERTAKING)

TABLE 1.11

MONTH	OPENING	CLOSING	CHANGE	% CHANGE
January 2011	9,473.80	8,706.88	-766.92	-8.0952
February 2011	8731.86	8380.61	-351.25	-4.0226
March 2011	8,417.12	8,960.08	542.96	6.4507
April 2011	8964.15	9070.29	106.14	1.1840
May 2011	9071.8	8582.38	-489.42	-5.3950
June 2011	8592.64	8542.74	-49.90	-0.5807
July 2011	8605.48	8307.52	-297.96	-3.4624
August 2011	8,334.03	7,615.62	-718.41	-8.6202
September 2011	7676.76	7,403.82	-272.94	-3.5554
October 2011	7360.69	7,555.08	194.39	2.6409
November 2011	7532.8	6858.57	-674.23	-8.9506
		TOTAL	-2,777.54	-32.4065

The opening index of this sector was 9473.80 in the month of January 2011 which is 6858.57 points in the month of November 2011 i.e. the index falls by 2777.54 points which is nearly (32.4065 %).

The table reveals that maximum gain in this sector was in the month of March 2011 of 542.96 points and the maximum loss in the month of January 2011 was 766.92 points.

COMPARATIVE ANALYSIS OF DIFFERENT SECTORS

TABLE 1.12

MONTH	SENSEX	BANK	AUTO	IT	FMCG	METAL	OIL&GAS	POWER	CD	CG	PSU
Jan 2011	-11.1235	-10.358	-13.958	-6.7426	-9.062	-9.0924	-10.8143	-8.3479	-5.6835	-12.5667	-8.0952
Feb 2011	-3.2661	-2.1383	-7.845	-4.4294	1.6649	-5.1143	-0.9995	-8.281	-6.072	-8.7697	-4.0226
Mar 2011	8.1355	11.5087	11.5135	6.5073	4.0619	4.6592	7.5551	6.9031	10.798	6.0459	6.4507
Apr 2011	-1.6809	-1.6548	2.9436	-5.9725	4.1717	0.0113	-2.3082	-2.0589	2.4559	-1.6554	1.184
May 2011	-3.7493	-4.314	-7.0151	-2.86	2.2717	-5.19	-4.3075	-4.1673	2.4372	-0.3413	-5.395
Jun 2011	1.7205	2.2909	-1.7291	1.7254	4.5145	-2.6482	-4.0154	2.0328	1.6031	6.1892	-0.5807
Jul 2011	-4.0989	-3.6167	-0.7578	-4.9474	0.9991	-7.6189	-5.4254	-6.0874	1.5322	-7.125	-3.4624
Aug 2011	-9.1296	-13.1353	-4.5294	-13.61	-3.964	-14.302	-5.9407	-9.3657	-7.2829	-7.7924	-8.6202
Sept 2011	-3.0059	-1.8683	0.6314	2.7741	-2.926	-9.9998	0.0232	-5.612	1.5611	-11.7192	-3.5554
Oct 2011	8.9139	6.6563	11.911	12.192	7.9362	9.3437	7.0273	4.7777	3.6699	3.2109	2.6409
Nov 2011	-8.0789	-13.3864	-10.3062	-4.6788	-2.879	-13.373	-8.5571	-12.017	-14.415	-11.2636	-8.9506
TOTAL	-25.3632	-30.0159	-19.1411	-20.042	6.7889	-53.324	-27.7625	-42.223	-9.3968	-45.7873	-32.4065

RESULTS

1. After analysis of the table 1.12, researchers have been found that there is significant differences between return of market and return of various sector but the direction of return were same (negative) except FMCG. Thus we reject null hypothesis ($H0_{1)}$.
2. After the study of tables 1.2 to 1.11 researchers concluded that there is a significant difference between the returns of various sectors during the relevant period. All the sectors have given negative return except FMCG where metal sector has shown the highest negative returns i.e. -53.324 % and Consumer durable sector has given lowest negative return i.e. -9.3968 % during the relevant period. Thus we reject Null Hypothesis ($H0_2$).

CONCLUSION

On comparing the all the sector at a glance as shown in table ,it can be concluded that during the relevant period Sensex has shown a downfall of 25.36% but surprisingly the FMCG sector has shown a positive gain of 6.78%.Therefore this is a sector which has outperformed during the period of the study.

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AN ANALYTICAL STUDY OF JOB STRESS AMONG SOFTWARE PROFESSIONALS IN INDIA

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ABSTRACT

Job stress is a common workplace problem experienced by all professionals irrespective of their nature of work; however, this phenomenon is more common in situations that are deadline driven. Software house is one such sector, which is affected profoundly by this challenge, and professionals serving these organizations are often observed under huge stress. Software professionals' nature of job is highly time-bound, client-oriented and technology intensive. The trends in turn, coupled with many factors, contribute towards stress. These factors are extremely diverse, including change of technology, client interaction, fear of obsolescence, family support, long working hours, and work overload etc. This study explores the nature of stress amongst software developers and professionals, and endeavours to identify the key factors responsible for producing stress amongst professionals, which limit their job functionality and overall productivity. The study was carried out through survey instrument, which was developed around ten stress factors. An analysis of about 200 professionals serving different software houses in the local context was carried out. The gathered data was analyzed using descriptive and correlation analyses which revealed interesting trends related with stress and age group, gender, marital status and qualification. The insights developed through this study are useful to many stakeholders in the local context, including software professionals, project managers, and the Electronics and Computer Software Export Promotion Council (ESC).

KEYWORDS
Job stress, software professionals, software developers, stress factors.

INTRODUCTION

Rapid growth of technology and its extensive use in business and industry has increased the competition manifold among organizations across the globe, and the worker of the 21st century is facing more challenges as compared to his/her predecessors. These compelling forces in the organizations are continuously reshaping the business strategies, restructuring the hierarchy, re-engineering business processes, and altering managerial practices, thereby, forcing the organizations to adapt innovative business models with their unique blend of technology.

The technological and structural changes in the organizations blurred the boundaries of traditional departments, modified the roles and responsibilities of employees and affected work-team relationships. On the one hand, those changes forced the organizations to acclimatize innovative technology for their business processes and pressurized the employees to accommodate them in their daily work routines; while on the other hand, automation of business processes created a huge demand of software development within the organization and they faced difficulties to accomplish those demands. That puts pressure on the software development team within the organization. The in-house software development team faced two basic problems: first they had time constraints, i.e. developing more software modules in a short span of time, and second, changing technology and learning upcoming technological changes to accommodate in their processes. One successful model to overcome the situation was outsourcing of software development. Hence, software development emerged as a roaring business in the last two decades and good quality software professionals were in a greater demand. Developed countries adopted the business automation quite earlier as compared to under-developed countries. This created a huge demand of software developers and professionals in those countries, hence an immense brain drain was also observed. The outcome of this brain drain resulted in the form of an acute shortage of quality software professionals in local software houses. This shortage further pressurizes the existing professionals and developers working in different software houses in India. The situation has also produced many other types of pressures in the organizations and has resulted in the form of job stress, job dissatisfaction, employee burnout and other related issues of employee motivation, behaviour, and performance.

OBJECTIVE OF THE STUDY

This study is aimed at conducting a research survey on software professionals and developers associated to various software houses in India, in order to explore various factors causing stress among professionals assuming diverse roles in software houses.

SIGNIFICANCE OF THE STUDY

Software development is a growing industry in India. **Electronics and Computer Software Export Promotion Council (ESC)**, is putting a lot of efforts, for the last many years, towards the betterment of software developers and professionals associated to software houses. This study will not only help ESC but also software houses and project managers to understand their work force.

RESEARCH METHODOLOGY

The research is quantitative in nature and a tailored questionnaire, comprising of 70 questions, along with demographic factors, is designed and distributed in various software houses all over India to collect the primary data.

The population of this study comprises of all software professionals working in different software houses in India and includes programmers, developers, and project managers and quality assurance personnel.

A sample of 500 professionals was selected by using proportional allocation and the same questionnaire was sent to the selected software houses for all types of people working there. However, due to poor response and many reminders, only 217 forms were received by the deadline of the study, out of which 12 were incomplete, hence the sample size was reduced to 205. The questionnaire is based on the seven-point Likert-scale, comprising of ten factors to measure stress. Along with this, demographic data is also collected through the same questionnaire.

VARIABLES

Following are the major factors contributing in job stress of software professionals working in different software houses (Rajeswari and Anantharaman, 2003):

1. Fear of obsolescence: Due to change of technology and quick learning of new technology.
2. Individual and team interaction: Interaction of analyst, developer and project manager.
3. Client interactions: Interaction during business analysis and system analysis.
4. Work-family interface: Taking work home or working for late hours.
5. Role overload: Assuming different roles in a different or same project.
6. Work culture: Travelling abroad and facing different cultures.
7. Technical constraints: Lack of technical expertise.
8. Family support towards career: Attitude and relation of the family towards work.
9. Workload: Excessive and diverse work.

10. Technical risk propensity: Risk due to using innovative technology or process.

JOB STRESS IN WORKPLACE

The continuing streams of information technology innovations are transforming the business world (Laudon and Laudon, 2007) from traditional work processes to IT enabled integrated environment. The impact of this change has brought many challenges to software professionals and developers, working in organizations as in-house programmers and developers. The rise in software demand to business and industry, beyond the capacity of MIS professionals, who cater to the needs of organizations, has given birth to software houses (Rajeswari and Anantharaman, 2003). These software houses are fulfilling the demand of industry and providing customized software according to the need and requirements of the client organizations, by using latest available technology and skills in the market. The technology is changing so swiftly that it is becoming difficult for the professionals to keep abreast with the upcoming technology along with the daily chores of the workplace. Software industry is a human capital intensive industry (Rajeswari and Anantharaman, 2003) and largely based on knowledge workers with technology concentrated environment. Also, the software development process is a learning and communication process (Glass, 1997); hence, it requires greater interaction with the clients, deep understanding of the nature and business processes, clear and timely communication with people involved in the development process, and insight into technological innovations. This situation puts pressure on professionals involved in the process of software development in software houses and results in occupational stress among them.

In 1990s, the restructuring of organizations and the trend of downsizing and rightsizing further engraved the situation for IT professionals with a fear of losing their jobs (Glass, 1997). Various studies in Japan were conducted to measure the stress among software programmers, and the studies concluded that programmers' stress was not only common but more problematic to the organizations (Glass, 1997).

WHAT IS STRESS?

Stress is defined as 'the pattern of emotional states and physiological reactions occurring in response to demand from within or outside an organization' (Greenberg & Baron, 2003; Singh, 2003). A stressor, on the other hand, is considered to be 'a condition or situation that elicits a negative response such as anger, frustration, anxiety or tension' (Rajeswari & Anantharaman, 2003). Workplace stress is quite common and can be measured through different sources. Workload, time pressure, role ambiguity, role conflict, career progress and communication are considered as major sources of pressure in the life of an Information System professional (Ivanchevich, Napier and Wetherbe, 1983). Pressure ultimately causes the stress that leads to different types of strain and finally hampers the performance of the employees. Stress, not just affects the efficiency of the employees, but also causes ailment and other physical or emotional problems as well (Singh, 2003).

STRESS IN DIFFERENT OCCUPATIONS

There is a belief that some occupations are sources of greater stress than others. However, it would be unwise to attribute stress, and its fatal consequences like employee burnout, health issues etc. only to professionals and executive groups (McKenna, 2002). There is a view that occupational stress is more likely to be found among blue-collar and routine white-collar workers because often they work to meet the difficult deadlines or the heavy burden of work does not give them time to relieve the pressure (Fletcher, Gowler and Payne, 1979). A survey of senior managers in 112 financial organizations conducted in 1986 in London, showed that 64% identified stress as their main health concern and worst affected were accountants and building society managers. Those who worked in the city identified 'too much work' as the biggest single factor in causing stress. Other causes mentioned were long hours, competition, pressure to perform, over-promotion, conflict between work and private life, and job insecurity (McKenna, 2002). The most frequently mentioned symptom of stress was deterioration in the employee's performance. Other symptoms identified were irritability, absenteeism, problems with making decisions, difficulties with drinking and depression (McKenna, 2002). A report by the UK Health and Safety Executive (Cox and Ferguson, 1994) calls into the problem of stress at work, as well as advocating training for employees. The report identifies excessive periods of repetitive work, lack of management support, and over demanding work schedules as contributory causes of stress. Additional factors were low pay, poor relationship with management, lack of variety, job insecurity, and conflicting demands of work and home.

Occupational stress, in particular, is the inability to cope with the pressure in a job (Ross, 2005) because of a poor fit between someone's abilities and work requirement and conditions (Holmlund-Rytkonen and Strandvik, 2005). A mental and physical condition affects an individual's productivity, effectiveness, personal health and quality of work (Comish and Swindle, 1994). Thong and Yap (2000) have summarized prior studies on workplace stress, showing that, while the topic of stress continues to interest information system researchers, there has been a lack of a cumulative tradition, in terms of the specific theoretical frameworks used to understand the problem.

JOB STRESS AMONG SOFTWARE PROFESSIONALS

SOFTWARE DEVELOPMENT PROCESS OVERVIEW

There is not a single way to define software development process like one assembly line; however, there are fundamental development principles underlying the process that provide the foundation to understanding the software house environment and its work-pressures. The series of steps that software undergoes, from concept exploration through final retirement, is termed as a 'life cycle' (Schach, 1996). The overall project planning requires a software system development life cycle to provide a framework for considering the specific tasks to be accomplished. It also needs to account for the interaction among management, development and software quality assurance and client throughout the project life cycle (Donaldson and Siegel, 2001).

CAUSES OF STRESS AMONG SOFTWARE PROFESSIONALS

Software development process is quite complex, from understanding of clients' requirement to the maintenance phases, different sets of knowledge and skills are required. Hence, various personnel are involved in a cycle, like business developers, project managers, system analysts, programmers, coders, and quality assurance people; apart from other consultants who provide the insight into the domain knowledge of the area in which software is developed.

Like other occupations, software development process is also engulfed with extreme stressors. Various factors have been identified as stressors among software development personnel. However, Rajeswari and Anantharaman (2003) have identified ten most important factors that are crucial in determining the job-related stress among professionals. These factors are: fear of obsolescence, individual and team interaction, client interaction, work-family interface, role overload, work culture, technical propensity, family support towards career, workload, and technical propensity. Fear of obsolescence is the stress caused by changing technology when software developers feel stressed to learn newer technology along with their routine job. Software development is a process carried out in various teams and requires greater interaction among team members which creates pressure on one member to timely respond to the other member, and transfer the details of work to them. Work culture in software houses also causes stress because software professionals often work for longer hours than usual; they are supposed to work even on holidays during near-completion time of their projects. Role overload is another major stress factor among software developers because if a team member leaves during the project then other members are supposed to take over the responsibility of that person. Involving a new member in the team requires the training of that person and delays the project.

According to Acton and Golden (2002), 'The satisfaction of employee and its retention in general is important; however, the retention of software personnel is vital for business successes.' This is also verified by the studies of MacDonald (2000). In fact, software development is a human-intensive industry and farsighted project managers recognize that the greatest impediments to success are often related to people rather than to information, technology, and systems (Roepke, Agarwal et al., 2000). Considering the high costs associated with replacing IT staff and their experience, it makes sense for companies to invest in mechanisms designed to keep IT staff longer (Mak and Sockel, 1999; Moore, 2000). This may involve keeping their job more relaxed and stress free. Hence, understanding the mechanism of their job and complexities is vital to optimize the performance and retention.

There is a strong reason to believe that software professionals, working either in a software house or in any organization for in-house development and maintenance, are prone to more serious risks as compared to people involved in such jobs two or three decades ago (Brod, 1984). It has been pointed out that 'high performance (requirements) with high technology can exercise a dangerous influence on the human personality ... anyone who is constantly working or playing with computers is at risk' (Kaluzniacky, 1998). The constant use of computers affects the users in terms of fatigue, eye strain, arm and shoulder pain, and

backache. Khosrowpour and Culpan (1989) published a stress-related study applied to individuals working in computer-related fields. They observed: 'Information processing professionals see change in technology as a prerequisite for their existence, yet the speed of this change can have profound psychological and physiological effects.'

In their studies, Kleiner and Geil (1985), Natalie (1995), and Fujigaki (1993) argued that it is important to measure the stress among computer professionals and their articles summarize and report the presence of stress among these professionals. Hoonakker (2005) argued about different factors associated with quality of working life and turnover. He pointed out that work and family life, if spill over to each other, create different psychological demands and cause stress and depression. Googins (1987) also reported the same phenomena. Other causes and consequences of stress have been assessed by different studies like: physical ailments by Frone et al. (1997), life satisfaction by Higgins et al. (1992), turnover at workplaces by Greenhaus et al. (1997), and job satisfaction by Netemeyer et al. (1996). In their works, Fujigaki (1993) and Furuyama (1994) have tried to measure the causes of stress among programmers and the impact of the stress in creating different types of errors in their work. Significantly, they have mentioned that stress is present in almost all phases of software development life cycle.

DATA ANALYSIS AND FINDINGS

The study is conducted through a research survey in major cities of India. A questionnaire was distributed in various software houses through a contact person in every software house.

RESPONDENTS' PROFILE

- 71% respondents are involved in technical job and others are doing both managerial and technical jobs
- 46% respondents have undergraduate degrees in Computer Science and 22% have postgraduate degree in computers, while others have degrees in different disciplines
- 29% respondents have one or more certification besides their degrees
- 83% are male
- 29% are in the age group of 21 to 24 years and 48% are in age group of 25 to 28 years
- 75% are unmarried

RELIABILITY AND VALIDITY

RELIABILITY

The reliability of the scales is determined through Cronbach's Alpha and all the variables are found reliable, that is, the value of alpha is greater than .7 except workload.

VALIDITY

The validity of the scale is determined through the people working in different software houses.

DESCRIPTIVE ANALYSIS

Each factor of stress is measured on a seven-point scale, where '1' indicates the lowest level of intensity and '7' indicates the highest level of intensity**.** Table 2 shows the average level of intensity of each subscale along with their standard deviation. On the basis of coefficient of variance (CV %), the factors that are contributing more towards jobs stress are 'fear of obsolescence' (mean 3.97), 'client interaction' (mean 3.86) and 'technical constraints' (mean 3.40). While next two factors of job stress are, 'team factors' (mean 3.11) and 'role overload' (mean 3.38). Hence, major factors contributing towards the job stress are not the work or workload but changing technology, availability of technology and availability of technical staff to build the suitable team for a project.

TABLE 1: DESCRIPTIVE ANALYSIS OF FACTORS

Factors	Min	Max	Mean	SD	CV%
Fear of obsolescence	1.94	5.94	3.9702	.7512	18.92%
Team factors	.00	6.77	3.1126	1.1735	37.70%
Client interaction	.00	6.71	3.8648	1.4203	36.75%
Work family interaction	.00	6.71	3.2251	1.3287	41.20%
Role overload	.00	6.13	3.3848	1.2821	37.88%
Work culture	.00	6.75	2.2780	1.7766	77.99%
Technical constraint	.00	6.80	3.4039	1.2487	36.68%
Family support	.00	7.00	2.8951	1.4531	50.19%
Workload	.00	7.00	3.7463	1.5392	41.09%
Technical risk	.00	7.00	3.3837	1.4568	43.05%

Work culture and family support has the least priority in contributing to jobs stress, because work culture is measured through data where professionals are visiting foreign countries and having stress due to new environment and culture, where most of the workers have not reported any foreign experience. Similarly, family support is not found as stressor because 75% respondents are unmarried and 76% are under the age of 28 years.

CORRELATION ANALYSIS

The correlation matrix reveals that the highest correlation is found in 'workload' and 'work family interaction' i.e. .624, and 'client interaction' and 'work overload' are also highly correlated. Hence, this suggests that staff interacting with clients have multiple roles in the organizations and this mounts stress among the professionals at senior positions. On the other hand, there is weak correlation between fear of obsolescence with work culture and workload. Similarly, there is an obvious weak correlation of client interaction with family support. One factor 'role overload' has very high correlation with almost all other factors. Hence, this seems to be a greater source of stress or at least the cause of creating stress through other sources as well.

TABLE 2: CORRELATION MATRIX OF FACTORS

	1	2	3	4	5	6	7	8	9	10
1	1.000	.474	.401	.354	.315	.268	.349	.213	.185	.349
2	.474	1.000	.501	.472	.569	.409	.346	.358	.309	.348
3	.401	.501	1.000	.547	.616	.307	.489	.197	.450	.434
4	.354	.472	.547	1.000	.586	.433	.358	.420	.624	.344
5	.315	.569	.616	.586	1.000	.438	.559	.308	.535	.572
6	.268	.409	.307	.433	.438	1.000	.425	.356	.291	.365
7	.349	.346	.489	.358	.559	.425	1.000	.319	.359	.488
8	.213	.358	.197	.420	.308	.356	.319	1.000	.335	.315
9	.185	.309	.450	.624	.535	.291	.359	.335	1.000	.442
10	.349	.348	.434	.344	.572	.365	.488	.315	.442	1.000

ANALYSIS OF VARIANCE

Analysis of variance is applied on subscales to check whether all subscales have the same impact of stress or not. The analysis suggests that each factor does not contribute equally in the overall stress. Individual analysis of the factors also reveals that 'fear of obsolescence' and 'team interaction' are the most important contributors towards job stress in software houses.

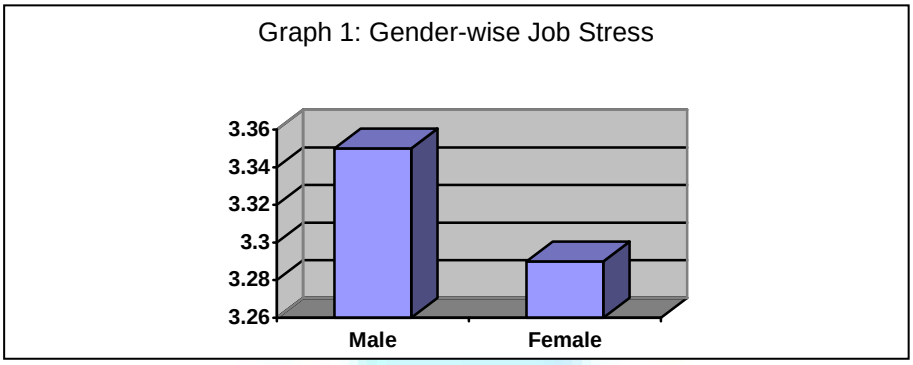
TABLE 3: ANALYSIS OF VARIANCE (ANOVA)

Source of Variation	SS	df	MS	F	F crit
Between groups	458.0577	9	50.8953	27.2369	1.8845
Within groups	3811.979	2040	1.8686		
Total	4270.036	2049			

DEMOGRAPHIC ANALYSIS OF FACTORS

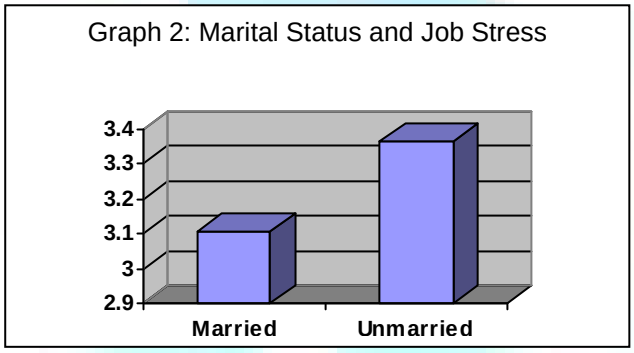
ANALYSIS BY GENDER

When analyzing the data by gender, it is found that fear of obsolescence is the dominant factor both in males and females. Similarly, client interaction is equally distressful for both the gender, as the next higher stress-creating factor. The factors creating lowest stress are work culture and family support among both males and females. This is obvious because work culture is associated with the adjustment of the environment of foreign culture when the professional is travelling abroad. Also family support will become irrelevant because majority of the participants belong to the age group of 21 to 28 and are unmarried.



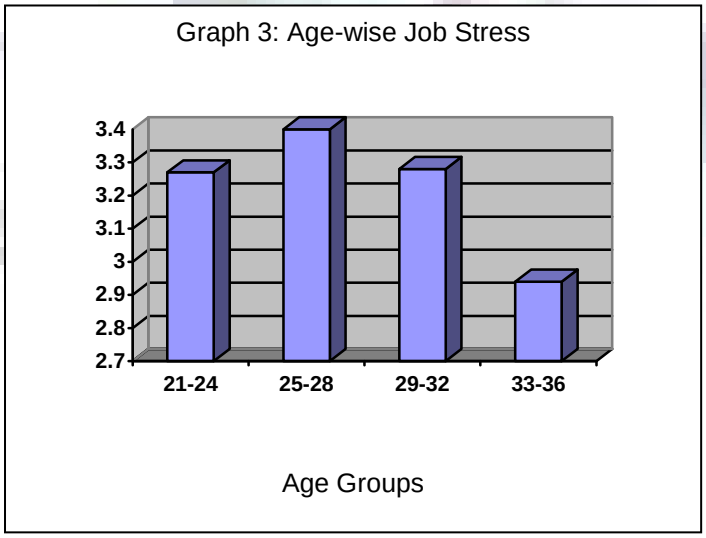
ANALYSIS BY MARITAL STATUS

A higher degree of stress is found in unmarried people as compared to married people on the average. Also fear of obsolescence and workload are two strong stressors among unmarried people, whereas fear of obsolescence and client interaction are greater sources of stress among married people as compared to other factors. One of the reason of this phenomena is quite possible: married people may belong to higher age group and are working on both technical and managerial positions, hence, client interaction is a major factor contributing to their stress; while unmarried people are working for stretched hours, hence, feeling stressed due to workload. The lowest factors contributing in stress in both the cases are found to be family support and work culture.



ANALYSIS BY AGE

The data is collected from age groups ranging from below 20 years to above 40 years; however, no respondent reported the age above 40, while only one respondent could be included in the age groups of below 20 years and 37–40 years and both are showing very high stress; while the age groups from 21 to 36 years are showing normal stress. On the average, the age group 25–28 years are reporting the highest stress, and the obvious reason of this could be role overload and changing technology, because under this age group mainly relates to technical jobs.



ANALYSIS BY QUALIFICATION

The analysis according to various degrees and qualification shows that almost all types of qualifications: B.Tech, M.Tech, BCA, MCA, MBA (IT), B.Sc, or M.Sc are experiencing equal stress. Hence, qualification does not create any significant impact on the job stress.

ANALYSIS BY JOB

Majority of the professionals working in software houses belong to the technical category. However, most of the people who are working as technical support are also experiencing the managerial support i.e. they reported to work both as technical and managerial positions. On the average, those people who are working both as technical and managerial support in the software houses are experiencing more stress, and showed the higher causes of stress as fear of obsolescence, client interaction, and workload.

KEY FINDINGS

1. Analysis of variance suggests that all factors taken into account are not equally contributing towards job stress among software professionals working in different software houses in India.
2. On the average, 'fear of obsolescence' is the most contributing factor in job stress, and is found as a prominent factor of stress in all demographic strata.
3. 'Client interaction' and 'workload' are next major factors, after fear of obsolescence.
4. According to correlation analysis of the factors, highest correlation is found of 'workload' with 'client interaction' and 'work family support'; and moderate correlation is found with almost every other factor.
5. The most significant finding is obtained through demographic analysis, and it reveals that, males are more under stress as compared to their counterparts, unmarried are more distressful as compared to married, and the age group of 21 to 28 years experiences higher stress with respect to their senior colleagues. Hence, the specific group of 'unmarried males in the age group of 21 to 28 years is found highly under stress as compared to other demographic segments.
6. Those professionals who are playing dual role of handling technology and managerial position are facing more stress.
7. Qualification or degree of the participants is not showing any impact in causing stress.

CONCLUSION AND RECOMMENDATIONS

The professionals working in software houses of India are experiencing a moderate kind of stress in their job. This stress is equal for male and female members and there is no significant difference among them, but males are experiencing slightly higher stress as compared to females. One of the reason of this can be that males are supposed to work for longer hours as compared to females, and usually they take work along to their homes after working hours and at weekends, while females avoid to work longer hours especially late night sittings. It is also reported that males are supposed to work on Sundays as well, when the project deadlines are approaching nearer. Another reason of stress among the males is that they are more work overloaded as compared to their female counterparts.

The age group of 21 to 28 years has the highest stress as compared to their senior colleagues. The reason revealed through discussion with different professionals is that they are working for long hours, are fresh and energetic, and interested to work for longer hours in groups and friendship circles, usually formed when a project starts because they do not have much responsibility at their homes. This age group is also involved in pursuing further education, hence the added pressure of studies along with their jobs'.

The prominent segment, which reported the highest stress, is unmarried males in the age group of 25 to 28 years, and the probable reasons found through the discussion are: they are supposed to learn newer technology along with their daily job chores which puts a lot of pressure. They are more engaged in client interaction, and satisfying the client is considered the most difficult part in software projects. Also, most of the time, clients themselves are not clear about their requirements, hence, they do not freeze their requirements, which causes disruption and delays in the project and puts pressure on all other members working on the project. Therefore, it is concluded that the software professionals working in different software houses of India are experiencing moderate stress in their job.

The ten variables considered in this study contributing towards the job stress of software professionals do have equal weight and contribute differently, for example, family support and work culture have not much impact on our study, and hence these factors can be omitted or merged with other factors. Similarly, technical constraint and technical risk can be combined as one single factor. This will reduce some variables from the study and more prominent variables can emerge or the impact of other variables can be measured more precisely.

The performance of part of the stress can also be added to distinguish the stress and distress; this will also provide the impact of each variable on overall performance of the employee. It is also recommended that the scale should be reduced to one to five instead of one to seven, because the seven-point scale created difficulty in understanding the difference between two successive points, for example, having the stress of 'less than moderate' and 'low stress' more or less created the same meaning as discussed with software professionals. So having a clear understating and quantification of the precise words can create more meaningful results.

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PROCESS FRAMEWORK FOR BUSINESS VALUE ENHANCEMENT BY IMPROVING OPERATIONAL EFFICIENCY

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ABSTRACT

There has been a continuous evolution of business processes with a focus on value enhancement from multiple dimensions. High-performing global organizations also face challenges in the effective coordination and control of operations. The need to manage diverse business requirements in the midst of competing priorities makes it important for an organization to focus on Business process improvement. This necessitates monitoring of key business parameters such as optimal utilization of resources and performance effectiveness, while meeting or exceeding customer needs and expectations. The enhancement of value in a business also needs an understanding of the key "business drivers" and identification of "Value differentiators" and "Value enhancement opportunities". A Value Enhancement Framework is presented here encompassing Activity analysis, Value analysis of activities, and Action Planning analysis. The enhancement of value related to the design process in a business environment is provided as an illustration. A Collaborative working model and a Shared Value approach for Business Value enhancement are also discussed. It is important for an organization to focus on process improvement for enhancing operational efficiency. This, in turn, would positively influence customer delight, profitability, and overall business value.

KEYWORDS

Optimization, Business Value enhancement framework, Collaborative working model, Shared Value Approach, Operational efficiency.

INTRODUCTION

Business processes have been continuously evolving since the Industrial Age. The performance of a business depends on high quality levels in the supply of products and rendering of services. This needs to be accomplished in the midst of stringent competition. These aspects have propelled the need for enhancement of value in business performance.

Value could be considered as the monetary worth of goods or services. It could be referred as "our sense of what something is worth". In a product, value could be measured as the ratio of Functions to Cost (F/C). Value is a function of the satisfaction of stakeholder needs and the utilization of resources.

In a manufacturing industry, "value-adding processes" enable conversion of raw materials into products / outputs that provide worth to humankind. In the service sector, value is provided to the customer by means of inputs such as knowledge, processes, and systems.

NEED FOR VALUE ENHANCEMENT

The creation of Value in operations could be related to the words of Aristotle, namely, 'First have a definite, clear, practical ideal; a goal, an objective. Second, have the necessary means to achieve your ends; wisdom, money, materials and methods. Third, adjust all your means to that end'. In the words of James Moore, "The only sustainable competitive advantage comes from "out-innovating" the competition".

Global business models cause strenuous impact on the health of an organization. With a global operational model, high-performing global organizations face challenges in the effective coordination and control of operations. Organizations struggle to balance between driving of common processes across the globe and the requirement to tailor processes for meeting the local business functional needs. This push-pull perspective along with management of diverse business interests in the midst of competing priorities make it necessary to focus on Business process improvement. The mapping of all related processes in a business environment and their understanding is required for bringing about real and effective change.

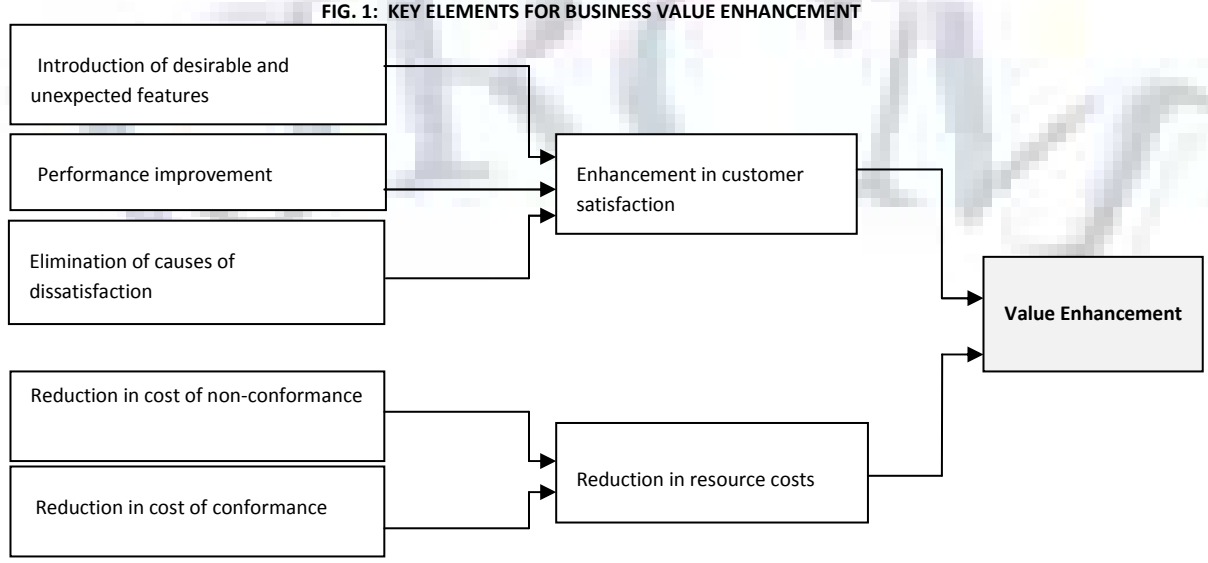
For example, the investment in Information Technology by financial institutions my not yield full benefits due to inadequate controls on the incoming demand, lack of sufficient resource coordination efforts, and issues in transparency of performance. Technology could have helped in driving down the cost of IT services delivery, but productivity barriers need to be addressed through effective process improvement mechanisms.

Many leading organizations are deploying process improvement methodologies and principles of lean management in their business. This has yielded benefits such as substantial enhancement in accuracy, efficiency, timeliness, and risk control.

The Value-driven focus in the current business scenario revolves around technological advancements and methodological improvements. Quality and Innovation facilitate value creation and enhancement and serve as differentiating factors in the supply of goods or services. It is required to enhance business value from various perspectives such as business unit perspective, organization perspective, customer perspective, etc. This necessitates the optimization of multiple parameters such as processes, resources, and cost.

The objective of any business is to enhance value while optimizing the usage of resources. The key elements for value enhancement are depicted below:

FIG. 1: KEY ELEMENTS FOR BUSINESS VALUE ENHANCEMENT



BUSINESS VALUE ENHANCEMENT: APPROACH AND CRITICAL SUCCESS FACTORS

Value enhancement in a business could be accomplished using various approaches as depicted below:

FIG.2: APPROACHES FOR BUSINESS VALUE ENHANCEMENT

	Customer Satisfaction	Resources utilization	Remarks
Approach A	↑	↓	Enhancing customer satisfaction and reducing resource utilization
Approach B	↔	↓	Maintaining current level of customer satisfaction and reducing resource utilization
Approach C	↑	↔	Enhancing customer satisfaction while maintaining current resource utilization levels
Approach D	↑	↑	Substantially enhancing customer satisfaction through marginal increase in resource utilization

Some of the key elements in the enhancement of value in business operations include the following:

- Understanding key "business drivers" that contribute substantial value
- Identification of "Value differentiators" and "Value enhancement opportunities"
- Fact-based decision-making and management
- Risk management strategies and contingency planning
- Analysis of "Pros and Cons" of alternative scenarios / options
- Analysis of linkage between decisions, goals achieved, and contributed value
- Utilization and dissemination of best practices
- Formulation of a road map for value enhancement

Value enhancement in a business is reflected by streamlining operational steps through a better focus on critical and value-adding aspects and eliminating non-value adding elements. Further, aspects such as reduction in cycle time and work-in-process inventory, improvement in quality, response times, and resource utilization effectiveness coupled with an increase in productivity enable enhancement of the overall value of the business.

Some of the critical success factors for a business value enhancement initiative are:

- Clarity of Vision and Strategy
- Management commitment for the initiative
- Level of readiness of the organization
- Appropriate Organizational Culture
- Ownership and Focus
- Adequate resources / support
- Capability and expertise
- Effective Communication, Co-ordination, and Teamwork

THE BUSINESS VALUE ENHANCEMENT FRAMEWORK

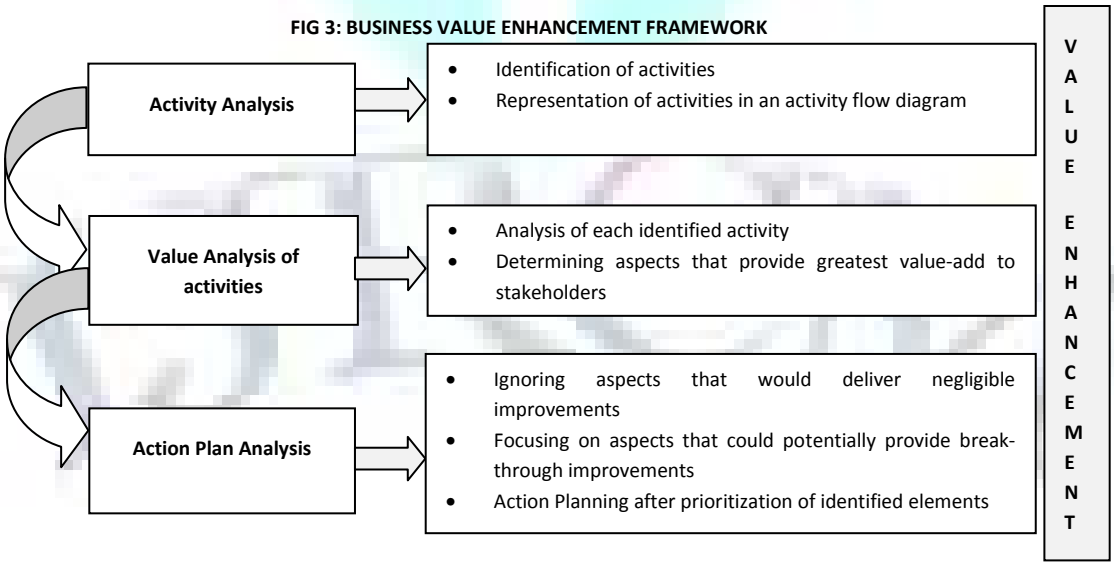
The Business Value enhancement framework comprises key aspects such as Activity Analysis, Value Analysis and Action Plan Analysis.

Activity Analysis involves Identification of activities related to development and delivery of a product or service and representing them as an Activity flow diagram. Value Analysis of each identified activity involves determining the aspects that need to be done to provide the greatest value-add to the customer. This requires a clear understanding of the Value parameters applicable for each activity. As an example, important Value parameters that need to be considered while providing service are Quality of Service, Timeliness, and Cost.

Subsequent to Value Analysis, an action plan for Value enhancement needs to be arrived at. This comprises steps such as ignoring aspects that would deliver negligible improvements, considering those elements that could potentially provide break-through improvements, and drawing up action plans for the identified elements after prioritization.

The Business Value enhancement framework is pictorially represented below:

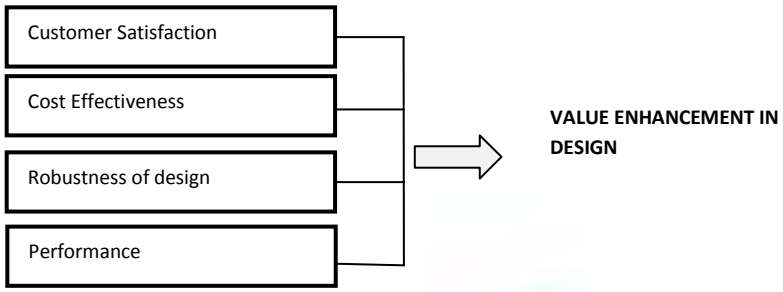
FIG 3: BUSINESS VALUE ENHANCEMENT FRAMEWORK



VALUE ENHANCEMENT IN THE DESIGN PROCESS: AN EXAMPLE

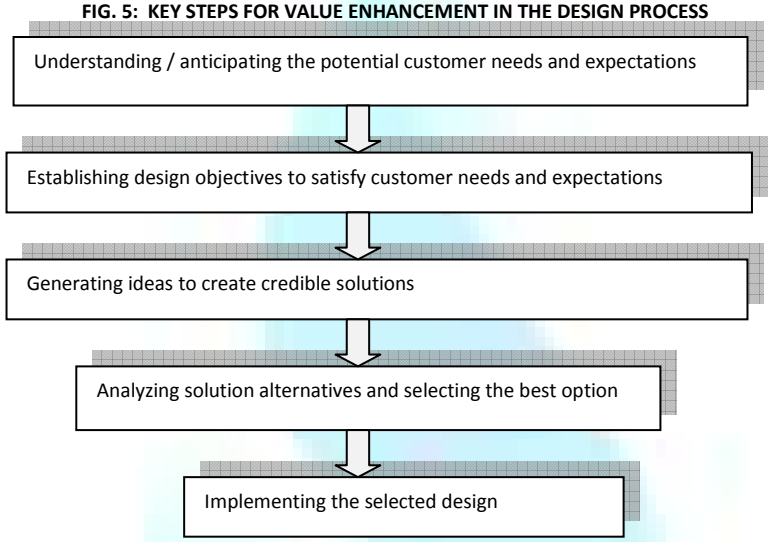
As an example, let us consider a design activity and the key aspects to be considered for value enhancement in the design process. The parameters include Customer Satisfaction, Cost-effectiveness, Robustness of design, and Performance as depicted below:

FIG. 4: VALUE ENHANCEMENT IN DESIGN



The key steps involved in enhancement of value in the design process are indicated below:

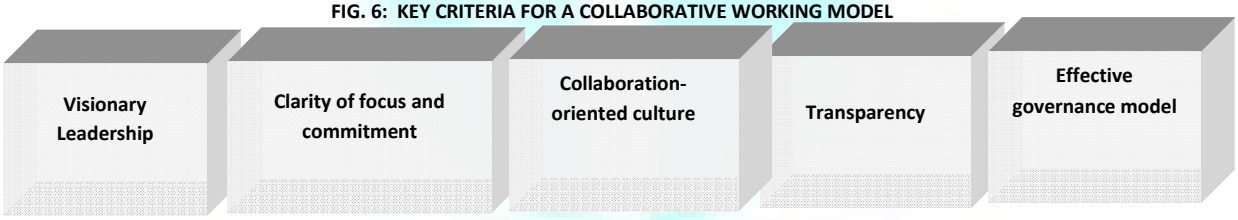
FIG. 5: KEY STEPS FOR VALUE ENHANCEMENT IN THE DESIGN PROCESS



BUSINESS VALUE ENHANCEMENT THROUGH A COLLABORATIVE WORKING MODEL

The value of a business could also be enhanced by leveraging value co-creation through a collaborative approach. Research studies have been conducted to analyze whether business value could be derived by means of a collaborative working model. Such collaborative approaches could facilitate small and medium enterprises to enhance their business value. Some of the key criteria needed for a successful collaborative working model are depicted below:

FIG. 6: KEY CRITERIA FOR A COLLABORATIVE WORKING MODEL



BUSINESS VALUE ENHANCEMENT THROUGH A SHARED VALUE APPROACH

In a shared value approach, enhancement of business value involves consideration of the needs of society apart from meeting conventional economic-oriented needs. This is based on the view that society-related weaknesses and negative factors could lead to the creation of additional internal costs in organizations. For example, aspects such as wastage of energy / raw materials, accidents, and the need for additional training to overcome educational deficiencies from a society perspective increase the business-related costs. Organizations such as Google, IBM, GE, and Intel in the Information Technology sector and those in the FMCG consumer sector such as Nestle, Unilever, Wal-Mart, and Johnson & Johnson have focused efforts towards creation of shared value. The shared value concept is looked at from two dimensions – namely society and business performance.

The enhancement of business value through a shared concept involves an appreciation of the needs of society, deeper levels of understanding of organizational productivity, and collaboration across profit/non-profit dimensions.

Hence, organizations could look at innovations in technologies, processes, and management approaches to enhance productivity and market expansion, ultimately leading to enhanced creation of business value.

CONCLUSION

A Value enhancement strategy considers elimination of elements or activities that are 'value non-contributors' and focusing on value creating elements. It also considers the elements that provide support in the value creation process. Business Value enhancement is not restricted to a particular phase or activity. It is relevant to the product or service being provided and also that of the business organization.

The ultimate objective of any business is to provide maximum value while keeping the utilization of resources to a minimum. Hence, achieving Value maximization through optimal resource utilization is the key for a business since it leads to enhanced operational efficiency. Enhancement of operational efficiency results in improved margins and better customer satisfaction, thus fuelling further growth of the business.

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AN OVERVIEW OF SUPPLY CHAIN MANAGEMENT PRACTICES IN INDIAN AUTOMOBILE SECTOR

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ABSTRACT

The Indian Automobile Industry is manufacturing over 11 million vehicles and exporting about 1.5 million every year. The supply chain of this industry in India is very similar to the supply chain of the automotive industry in Europe and America. The Indian automobile industry has undergone significant structural and other changes in the last decade. In view of the present globalisation, implementation of lean production and the development of modularization have changed the relationships between automobile assemblers (OEMs) and their suppliers, especially those in the first tier. The present paper examines the role of various players in automobile supply chain and also discusses the challenges faced by automobile supply chain and the need for integration of supply chain through information technology

KEYWORDS

Automobile Industry, Auto Component Industry, Challenges in Automobile Supply Chain, Role of IT in Automobile Supply Chain.

INTRODUCTION

The automobile sector is a key player in the global and Indian economy. The global motor vehicle industry (four-wheelers) contributes 5 per cent directly to the total manufacturing employment, 12.9 per cent to the total manufacturing production value and 8.3 per cent to the total industrial investment. It also contributes US$560 billion to the public revenue of different countries, in terms of taxes on fuel, circulation, sales and registration. The annual turnover of the global auto industry is around US$5.09 trillion, which is equivalent to the sixth largest economy in the world (Organisation Internationale des Constructeurs d'Automobiles, 2006). In addition, the auto industry is linked with several other sectors in the economy and hence its indirect contribution is much higher than this. All over the world it has been treated as a leading economic sector because of its extensive economic linkages.

India's manufacture of 7.9 million vehicles, including 1.3 million passenger cars, amounted to 2.4 per cent and 7 per cent, respectively, of global production in number. The auto-components manufacturing sector is another key player in the Indian automotive industry. Exports from India in this sector rose from US$1.0 billion in 2003- 04 to US$1.8 billion in 2005-06, contributing 1 per cent to the world trade in autocomponents in current USD.

India's automobile sector consists of the passenger cars and utility vehicles, commercial vehicle, two wheelers and tractors segment. The total market size of the auto sector in India is approximately Rs 540 billion and has been growing at around 8 percent per annum for the last few years. Since the last four to five years, the two wheelers segment has driven the overall volume growth on account of the spurt in the sales of motorcycles. However, lately the passenger cars and commercial vehicles segment has also seen a good growth due to high discounts, lower financing rates and a pickup in industrial activity respectively.

The Indian automobile industry is fairly concentrated, as in most of the segments two to three players have cornered a major chunk of the total sales. For instance, in passenger cars segment, MUL, Tata Motors and Hyundai Motors control around 85 percent of the total annual sales. Similarly, in the two wheelers segment, the sales volumes of Hero Honda, Bajaj Auto and TVS Motors constitute around 80 percent of the total sales and in the commercial vehicles segment, the market leader Telco controls around 56 percent of the total annual sales. The autocomponents industry on the other hand is highly fragmented, though there are dominant players in some of the critical segments.

NEED OF SCM IN AUTOMOBILE INDUSTRY

From the past two decades, automobile companies discovered new manufacturing technologies and strategies that allowed them to reduce the cost and better compete in different markets. Strategies such as Just-In-Time (JIT), Lean manufacturing, Total Quality Management (TQM) and others become very popular, and vast quantities of resources were invested in implementing these strategies.

In the last few years, however, it has become clear that Automobile Companies have reduced manufacturing cost as much as possible, now the automobile Companies are concentrating on effective Supply Chan Management (SCM) as the next step to decrease the operational cost and to increase their market share and profits.

Today there is fierce compititation in Indian Automobile industry with large number of players and products, the product life cycles are shortening, and operating margins are shrinkening,there is continues advancement in technology, moreover customer expectations heightened with regard to product quality, product availability, on time delivery, sales services and timely availability of information etc.

Further continuing advancement in communication systems and transportation facilities like mobile phone networks, internet and intranet systems and overnight delivery practices etc, intensified the need for efficient and effective Supply Chain Management (SCM) in Automobile industry.

As the number of companies are increasing in Automobile sector , competition forces prices to decline, flat sales, putting a premium on efficiency to maintain profitability and sales growth which calls for effective integration of front-end and back-end operations of Automobile companies which can be possible only with the implementation of Supply Chain Management practices in these sector.

S.C.M aids in product ordering, replenishment, inventory control and, more importantly, better control over logistic management, merchandising, and marketing operations .S.C.M also facilitates

Demand Forecasting, Customer data Analysis, Customer Relation Management(CRM) which can be effectively used in replenishment of product, production scheduling, order processing and order delivery etc; which will further help in smooth functioning of Automobile companies. So, there is much need for study of Supply Chain Management in Automobile Industry.

EMERGENCE OF SCM IN AUTOMOTIVE INDUSTRY

The automotive industry has historically used very large supply chains. Even during the industry's earliest days, Original Equipment Manufacturers (OEMs) purchased the bulk of the parts used in their products from suppliers, rather than making them in-house. Barriers to entry were low and the market was crowded with a plethora of OEMs.

A trend towards vertical integration then dominated the industry for several decades. This new business model eliminated many of the smaller OEMs who could not afford the capital investment it necessitated. Most either merged with larger firms or disappeared altogether. Automakers sought to reduce costs by making their own components and even producing their own raw materials.

Over the last few decades, OEMs have once again been relying more on suppliers for components and functions they once did on their own. Even individual parts units, such as Delphi and Visteon, have been spun off from their parent OEMs. In addition to supplying modules, suppliers are now relied on for a significant portion of the engineering of key vehicle components.

A key driver of the increasing complexity of industry relationships is the trend towards modular sourcing. Under the modular sourcing model, OEMs purchase preassembled sections of a vehicle from suppliers. The module is generally built of components supplied by several lower tier suppliers. This paradigm requires unprecedented collaboration between the OEM, the supplier providing the module, and the suppliers from which the module is sourced. A new supplier tier, referred to as the 0.5 tier suppliers, has appeared on the automotive landscape. These suppliers maintain extremely close relationships with OEMs and have final responsibility for managing suppliers of lower tiers.

As the relationships between OEMs and suppliers grow ever more complex, with increased interaction between participants of different tiers, as a result integrated supply chain is emerging as a necessary tool and enabler of this new business paradigm.

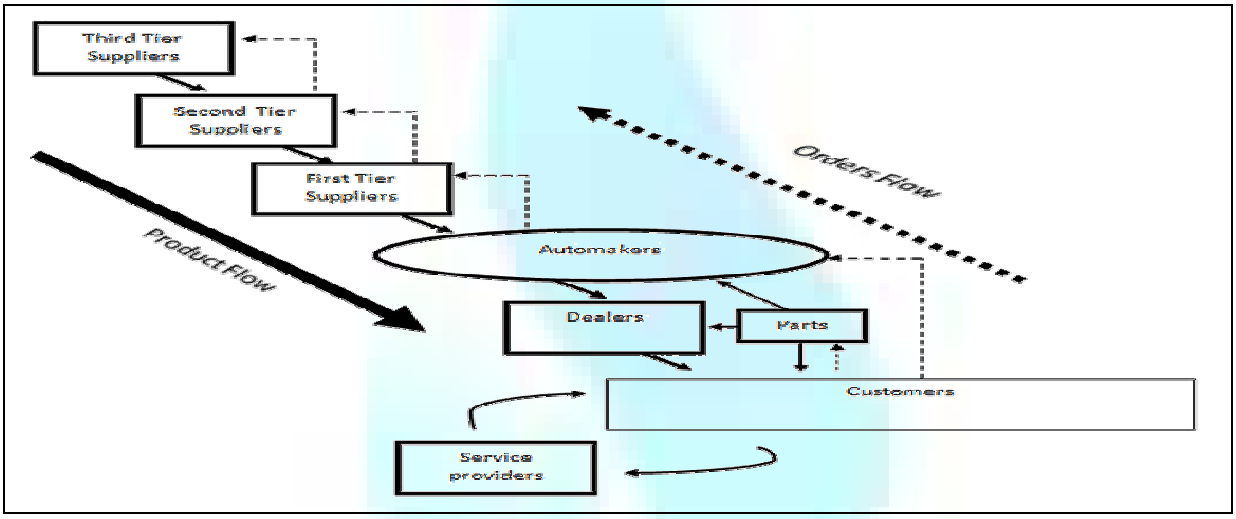
The Indian automobile industry has undergone significant structural and other changes in the last decade. In view of the present globalisation, implementation of lean production and the development of modularization have changed the relationships between automobile assemblers (OEMs) and their suppliers, especially those in the first tier. Stiff competition among manufacturers will result in more mergers or acquisitions. The challenges automobile manufacturers and suppliers face include improving quality, meeting cost reduction targets and developing time to market.

All this is driving the organisations towards greater product differentiation using cutting edge R&D, innovative sales and marketing approaches, and increasing focus on boosting efficiencies in manufacturing and supply chain. Hence, in the age of e-business and global outsourcing, supply chain management (SCM) plays a crucial role in many of these areas.

SUPPLY CHAIN OF AUTOMOBILE INDUSTRY

The supply chain of automotive industry in India is very similar to the supply chain of the automotive industry in Europe and America. The orders of the industry arise from the bottom of the supply chain i. e., from the consumers and go through the automakers and climbs up until the third tier suppliers. However the products, as channelled in every traditional automotive industry, flow from the top of the supply chain to reach the consumers. Automakers in India are the key to the supply chain and are responsible for the products and innovation in the industry.

FIGURE 1: SUPPLY CHAIN OF AUTOMOBILE INDUSTRY



Source: ImaginMor, Inderscience Enterprises Ltd and United Nations Industrial Development organisation.

PARTIES IN AUTOMOBILE SUPPLY CHAIN

The description and the role of each of the contributors/parties in the supply chain are discussed below.

THIRD TIER SUPPLIERS

These companies provide basic products like rubber, glass, steel, plastic and aluminium to the second tier suppliers.

SECOND TIER SUPPLIERS

These companies design vehicle systems or bodies for First Tier Suppliers and OEMs. They work on designs provided by the first tier suppliers or OEMs. They also provide engineering resources for detailed designs. Some of their services may include welding, fabrication, shearing, bending etc.

FIRST TIER SUPPLIERS

These companies provide major systems directly to assemblers. These companies have global coverage, in order to follow their customers to various locations around the world. They design and innovate in order to provide "black-box" solutions for the requirements of their customers. Black-box solutions are solutions created by suppliers using their own technology to meet the performance and interface requirements set by assemblers.

First tier suppliers are responsible not only for the assembly of parts into complete units like dashboard, breaks-axel-suspension, seats, or cockpit but also for the management of second-tier suppliers.

AUTOMAKERS/VEHICLE MANUFACTURERS/ORIGINAL EQUIPMENT MANUFACTURERS (OEMs)

After researching consumers' wants and needs, automakers begin designing models which are tailored to consumers' demands. The design process normally takes five years. These companies have manufacturing units where engines are manufactured and parts supplied by first tier suppliers and second tier suppliers are assembled. Automakers are the key to the supply chain of the automotive industry. Examples of these companies are Tata Motors, Maruti Suzuki, Toyota, and Honda. Innovation, design capability and branding are the main focus of these companies.

DEALERS

Once the vehicles are ready they are shipped to the regional branch and from there, to the authorised dealers of the companies. The dealers then sell the vehicles to the end customers.

PARTS AND ACCESSORY MANUFACTURER

These companies provide products like tires, windshields, and air bags etc. to automakers and dealers or directly to customers.

SERVICE PROVIDERS

Some of the services to the customers include servicing of vehicles, repairing parts, or financing of vehicles. Many dealers provide these services but, customers can also choose to go to independent service providers.

ORGANISED AUTO SECTOR IN INDIA

Automotive Sector in India is guided by various kinds of association that we can see in automobile supply chain as parties, these are

SIAM - Society of Indian Automobile Manufacturers

ACMA - Auto Components Manufacturers Association

FADA - Federation of Automobile Dealers Association
FISPDA- Federation of Indian Spare Parts Dealers Association
ARAI - Automobile Research Association of India

While the Original Equipment Manufacturers (OEMs) are at the top of the auto supply chain, it should be noted that there are a few OEMs in India which supply some components to other OEMs in India or abroad. Most of the Indian OEMs are members of the Society of Indian Automobile Manufacturers (SIAM), while most of the Tier-1 auto component manufacturers are members of the Automobile Component Manufacturers 'Association (ACMA). All of them are in the organized sector and supply directly to the OEMs in India and abroad or to Tier-1 players abroad. Tier-2 and Tier-3 auto-component manufacturers are relatively smaller players. Though some of the Tier-2 players are in the organized sector, most of them are in the unorganised sector. Tier-3 manufacturers include all auto-component suppliers in the unorganized sector, including some Own Account Manufacturing Enterprises (OAMEs) that operate with one working owner and his family members, wherein manufacturing involves use of a single machine such as the lathe.

THE INDIAN AUTO COMPONENTS INDUSTRY

Indian auto component industry is emerging as a global manufacturing hub for auto component manufacture. Indian auto component industry is one of the front runners for grabbing the global auto component outsourcing market, estimated to be worth US$700 billion by 2015. Auto components sector requires an incremental investment of Rs 2,000-crores as per the report of working group on automobile industry Eleventh Five Year Plan (2007-2012).

Today, India has the potential to manufacture a range of automotive components (about 20,000 in numbers) - from fasteners to engine parts Apart from the foreign demand, the domestic car production is also growing with sales expected to be about 10 million by 2009.

Auto-component manufacturers cater not only to the OEMs, but also to the after-sales market. In the recent years, there has been a rapid transformation in the character of the automotive aftermarket, as a fast maturing organised, skill-intensive and knowledge driven activity. Hence, the auto industry in India possesses a very diverse and complex structure, in terms of scale, nature of operation, market structure, etc. While output, emoluments and Gross Value-Added (GVA) have been growing in both the automobile and auto-component industries, employment is on the rise in the latter and it is declining in the former, fall in employment despite growth in total emoluments is a matter of concern in the automobile sector.

ROLE OF AUTO ANCILLARY INDUSTRY

The auto ancillary industry caters to three broad categories of the market:

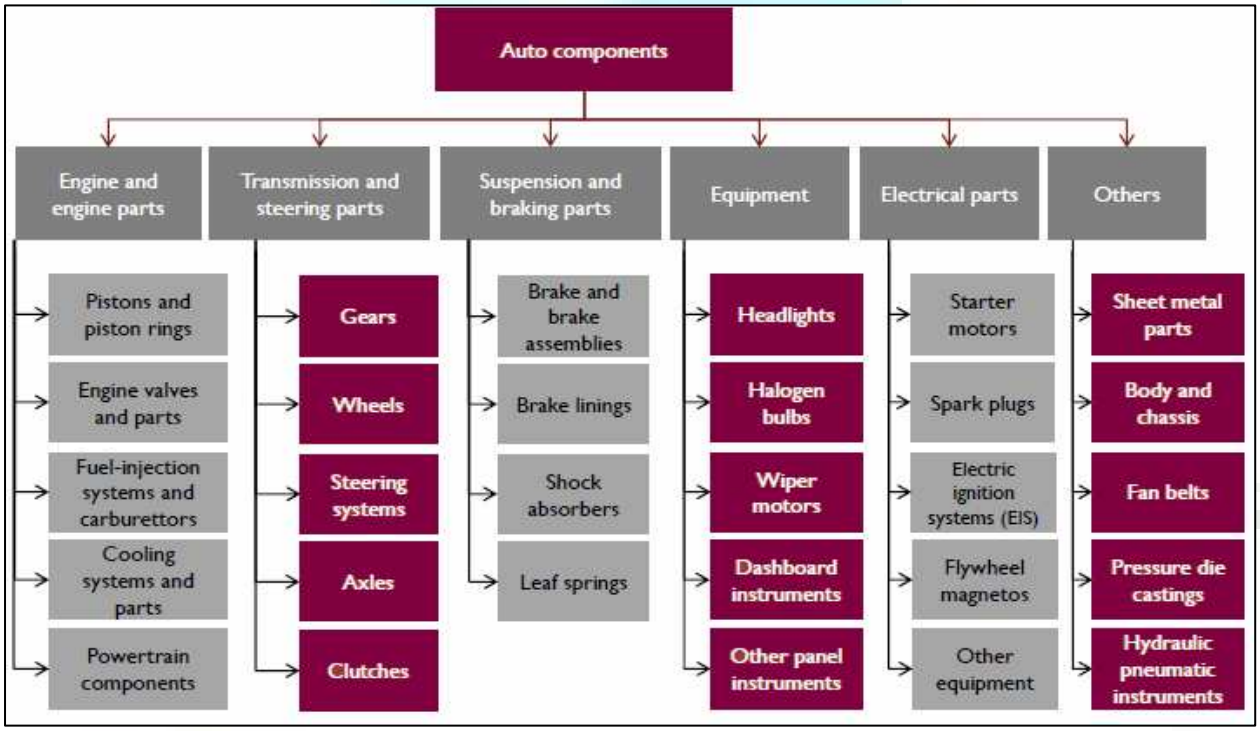
1) Original equipment manufacturers (OEM) or vehicle manufacturers, that comprises of 25% total demand
2) Replacement market that comprises 65% of the total demand
3) Export Market that comprises primarily of international Tier I suppliers and constitutes 10% of total deThe Indian auto component Industry is highly fragmented:

- Around 500 organized players account for the 77% of the value added in the sector.
- Unorganized players are mainly replacement market players or tier ¾ component manufacturers · Automotive Manufacturers Association of India (ACMA) represents the auto component industry in India and has around 500 registered members.

SEGMENT-WISE DIVISION OF AUTO COMPONENTS INDUSTRY

The auto components industry can be further divided into six main segments

FIGURE 2: AUTO COMPONENTS SEGMENTS



1) **ENGINE PARTS**

Engine assembly, fall into 3 broad categories: core engine parts; fuel delivery system; and others. This also includes products such as Pistons, Piston Rings, Ene Valves, Carburetors, and Diesel-based Fuel Delivery Systems. This by far is the most critical component and requires high involvement from the supplier.

2) **ELECTRICAL PARTS**

The main products in this category include starter motors, generators, spark plugs and distributors.

3) **DRIVE TRANSMISSION & STEERING PARTS**

Gears, wheels, steering systems, axles and clutches are the important components in this category.

4) **SUSPENSION & BRAKING PARTS**

These include Brakes, Leaf Springs, and Shock Absorbers

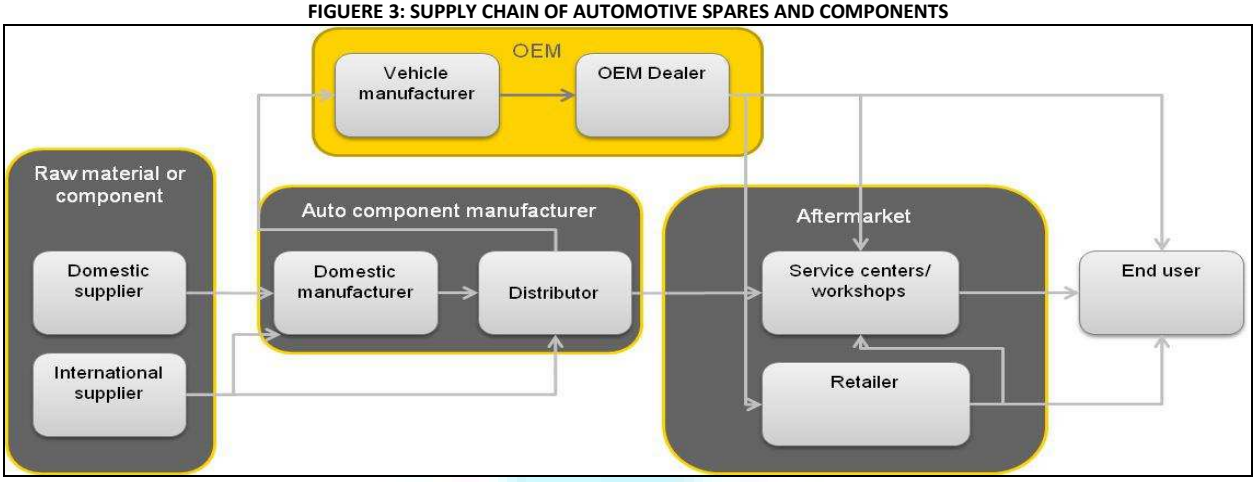
5) **EQUIPMENT**

This includes headlights, Dashboard Instruments

6) **OTHERS**

Sheet metal components and plastic molded parts are two of the major components in this category.

FIGUERE 3: SUPPLY CHAIN OF AUTOMOTIVE SPARES AND COMPONENTS



In a genuine automotive component supply chain, the manufacturer of auto components sources raw material either domestically or from an international supplier. The manufacturer can be the OEMs or independent (tier-I) manufacturers of auto parts. Vehicle manufacturers receive their supply of components from Tier I suppliers. The manufacturer then supplies the part to its distributors who in turn services the aftermarket. There may be a regional distributor in the aftermarket supplying the component to sub-distributors, or there may just be regional distributors for the product. The part is supplied from distributors to retailers or directly to large workshops. Finally, the component is sold to end consumers either directly or by replacing the part in their vehicle in the course of maintenance or break down service. This supply chain is generic and may not apply to all types of auto components, and some may have a very straight forward or even more complex supply chain.

TRENDS IN THE AUTOMOBILE INDUSTRY-IMPLICATIONS ON SUPPLY CHAIN MANAGEMENT

Recent emphasis on global climate change is increasing pressure on automotive executives to make the right decisions in many areas, including R&D and manufacturing. In fact, emission-level targets, currently in question, threaten to alter the entire structure of the auto industry.

These challenges hit an industry already plagued with high costs, low profit margins, and accelerating competition. New entrants from China (such as Chery Automobile) and India (such as Tata Motors) are working aggressively to capture their share of the global market, following the path taken by the Japanese in the 1980s and the Koreans in the 1990s—both of whom went beyond their domestic markets by focusing on the United States first, and on Europe later.

General macroeconomic and financial circumstances are not necessarily favorable, either. The cost of energy and raw materials continues to increase due to rising global demand. Strong fluctuations in exchange and interest rates pose another challenge and are difficult and costly against which to hedge.

In this dynamic business environment, a superior supply chain is one critical element to helping automakers differentiate themselves from the competition. In fact, many of trends in the auto industry are reinforcing the need to redefine supply chain strategies, layouts, and operations. This paper summarizes the current challenges in the automotive world and analyzes their implications on supply chains.

IMPLICATIONS OF TRENDS ON THE AUTOMOBILE SUPPLY CHAIN

Based on these challenges, eight major trends are identified witch affecting the automotive supply chain. The trends can be classified into two broad categories, these are:

I. Supply- Side Trends

II. Demand-Side

I. DEMAND-SIDE TRENDS

UNEVEN GROWTH

The demand for cars and two wheelers are growing, stemming in large part from China, India, and Eastern Europe. Established automotive markets in the United States, Western Europe, and Japan, however, are flat to declining.

This uneven growth raises implications for the supply chain. For one, OEMs and their tier-1 suppliers must establish a local presence to benefit from these new growth opportunities in emerging economies. They must also tap into the local supply base to take advantage of cost levels and to fulfill local content requirements. At the same time, they must integrate local operations into their global supply chain management systems and programs. For example, sourcing processes from local suppliers must be aligned with global quality-assurance guidelines and procedures.

FRAGMENTATION

Traditional car segments such as sedans, vans, hatchbacks, and pick-up trucks are fragmenting more and more into niches. Derivative car segments, on the other hand—such as coupes, roadsters, minivans, and two-seaters, as well as cross-over vehicles such as four-door coupes, SUV coupes, “soft”1 SUVs, and sport vans—are growing. In the two wheeler segments there is clear division is emerged with economy and premium two wheeler segments with different engine powers ranging from 100cc to 350 cc and wide verity of models like Scooterette , mopeds, and motor cycles etc.

A combination of customer demand for personalization—the right product for their specific use at the right time—and manufacturers conquering new customer segments is causing automakers to grow their product offerings. The environmental or “green” movement is encouraging fragmentation even further, by shifting demand away from large and/or high-consumption vehicles to smaller and/or more fuel-efficient cars, giving birth to even newer segments, such as city or micro cars, and new propulsion technologies, such as hybrids, clean diesels, and diesel hybrids.

Despite measures to control incremental costs resulting from fragmentation—such as platform, module, and component sharing across models and brands segmentation results in a more complex supply chain that needs to be managed. Hence, the supply chain requires integrated capabilities and flexible tools based on real-time information to address this increasing complexity.

For example, using an identical gearbox in two different two wheeler models does not prevent the manufacturer and its supplier from having to manage the supply chain process on a transparent basis to ensure on-time delivery of the specific gearbox to the specific assembly line in the specific location.

ACCELERATED VOLATILITY

In the past, forecasting new product demand was easy. Today, new model automobile that initially sell well may lose ground within as little as two years. Shifts in customer demand—from product to product, from brand to brand, and from segment to segment—are accelerating. Customers have more choices than before, want more personalization, and, in general, enter the showroom better informed. As a consequence, customer loyalty is decreasing—across all segments and across all manufacturers.

The supply chain, therefore, must cater to these shifts through quicker responsiveness and overall flexibility. Yesterday, it was enough merely to set up the supply chain when launching a new product and then make a few changes to it over the product's lifecycle. Today, a higher degree of flexibility and responsiveness must be built in up front so that suppliers can react quickly when overall product volumes are not in line with plan, or when the mix within the product differs from original forecasts.

AFTERMARKET

The automotive aftermarket is attractive because of its continued growth potential. Trends in vehicle usage and ownership show that there will be an increasing need for spare parts and service. Spare parts are stocked at each location along the supply chain, and each node experiences different pain points. It is highly challenging to get the right part to the right place as quickly as possible – without significant over stocking or under stocking.

The automotive spare parts supply chain is vast and highly fragmented. Manufacturers should work with suppliers and dealers to persuade their consumer base to return for service after the sale of the vehicle. They should also work to build a base of responsive to customers across the broad spectrum of channels that consumers use for servicing their vehicles.

The aftermarket supply chain varies company to company, in some cases spare part manufacturer supplies genuine spare parts to manufacturer of two wheeler , then manufacturer supply it to their dealers and distributors and authorized service center etc. in some cases spare part manufacturer also supplies spare parts along with two wheeler company. There are also spare parts companies which supplies spare parts to dealers, service centers and auto mobile retailers without any relation to companies supply chain, this type of supply chain is called grey market chain.

Creating transparency in the aftermarket business both in sales and in operations of the business and value chain is an important way for automakers to defend this source of revenue and profit against independent parts and service suppliers.

II. SUPPLY-SIDE TRENDS

DIFFERENTIATED OUTSOURCING

Outsourcing in the automotive industry will continue. Differences in labor costs and disadvantages in scale and scope are influencing this trend. Outsourcing will create opportunities for both automotive suppliers and supply chain management providers (such as logistics companies and IT firms) to expand their businesses into adjacent areas like, preassembly or management and quality control. To benefit from continued outsourcing, supply chain management providers must offer flexible, modular solutions because not every manufacturer will concentrate on the same core capabilities and functions.

LOW-COST-COUNTRY SOURCING

The auto industry will continue to source from low-cost countries as manufacturers and suppliers continue to complement their commodities with more complex products and services. The lowest price, however, isn't everything—automakers and suppliers must look at the total cost of sourcing, including logistics, quality of work, and management. This approach is referred to as "best-cost-country" sourcing, and for supply chain management providers represents another opportunity to encourage, enable, manage, and optimize sourcing.

RISK MANAGEMENT

Most manufacturers agree that their supply chain risk has increased in recent years. Natural disasters, terrorism, workforce issues, and level of dependence on partners and suppliers are just some areas that require strong capabilities in risk management. Manufacturers and their suppliers must account for supply chain alternatives in their overall supply chain strategy. Increased transparency based on real-time information allows them to identify risks early on and, ultimately, to manage them. This represents an opportunity for supply chain management providers to expand their value-added services. They have the opportunity to become risk-mitigation agents by ensuring the required transparency and by offering, like, fall-back solutions or performance guarantees.

TRANSPARENCY AND ACCOUNTABILITY

Business operations are becoming more complex and global. Supply chains are turning into complex supply networks. As a consequence, auto manufacturers and suppliers need transparency and accountability across the entire supply network. For example, near-real-time information flow based on a sensor-driven supply chain across the extended enterprise is in high demand. Information should, ideally, flow in two directions to help ensure better and faster interactions within enterprises and among OEMs, suppliers, and supply chain management providers.

At the same time, there is a focus on security across these complex information networks, led by the need to manage risks. The supply network has become very complex globally and is optimized to the penny. Because of this, automakers and suppliers cannot afford to go after breakdowns in the supply chain. Providers must deliver performance and output in a transparent manner—they are now held accountable much more stringently than in the past, and are at risk when it comes to paying high penalties in case of nonperformance.

KEY ISSUES / CHALLENGES IN AUTOMOBILE SCM

Indian automotive players today face several key challenges in managing their supply chains. According to KPMG survey the automobile companies were ranked the challenges in automobile supply chain in order of priority as follows:

INTEGRATING THE ENTIRE SUPPLY CHAIN

The most significant challenge identified by automotive players in India is 'integrating the entire supply chain' and managing it as a single integrated entity. While past efforts of OEMs have been focused on streamlining and improving different areas of the supply chain independently, through efforts in dealer management, operations planning, vendor rationalization, IT package implementation etc, it is expected that the linking up of these activities is expected to provide significant benefits to players, as this would involve aligning the entire chain to meet market requirements in the most efficient way.

The key challenge in achieving this would be two-fold – to align the different stakeholders along the chain – vendors, transporters, distributors and dealers – along common goals and processes, and also to integrate and link disparate IT systems used by different stakeholders.

MANAGING INBOUND LOGISTICS

Managing inbound logistics will be a key concern for OEMs as well as auto component players, driven more by challenges related to reliability of data, lead time and absence of quality logistics players on the upstream side. However, it is felt that this was a key area of focus, given the criticality of supply for future growth.

MANAGING PRODUCT AND PART PROLIFERATION

This is one of the second significant challenges players face. Increasing competition in the Indian automotive industry has led to significant shrinkage in product lifecycles and the need for regular and frequent product up gradation and new product introductions. While this has led to issues of managing a wide product portfolio, a related key issue is the proliferation of parts/components, driven by the need for providing spare parts for current as well as discontinued models. Respondents across both OEMs as well as auto-components indicated that increasingly the need for common platforms, and hence common parts becoming critical pre-requisite. A key role played by product development teams today is the identification and adoption of common parts and components across models. Costs, quality and timely delivery continue to be key concerns for players, driven by increasing competition and pressure on margins. Many OEMs have implemented 'Just in Time (JIT) supplies in their inbound logistics'. However, in cases where this is not accompanied by increased visibility across the supply chain and improved planning, it has only resulted in the burden of inventory getting shifted from OEMs to their Tier-I vendors.

POTENTIAL AND MARKET SIZE OF SCM IN INDIA

SCM solution market has been making inroads in India and it is being accepted widely by many industry sectors in the country, particularly manufacturing, automobile and retail where inventory carrying cost is very high.

According to CMIE, over Rs 100,000 crore of industry sectors are tied up due to high inventories. In India, logistics cost is very high as compared to other developed countries. It forms around 14% of the country's total GDP. Transportation accounts for 35%; inventory for 25%; losses for 14%, packaging for 11%; handling and warehousing for 9%; and others for 6%. Several automobile manufacturers in India have taken proactive measures to control their logistics cost and improve customer services. Several measures were undertaken by Indian companies to improve their supply chain.

In India, some of the automobile manufacturing companies have adopted e-sourcing, which helped them to reorganize the purchasing process and supported the aggregated buying across business units with the help of Internet-based tools or B2C Internet portals. With the use of Internet, more global suppliers have

participated compared to the traditional strategic sourcing process. The process reduces time spent on negotiating, accelerates information gathering and speeds up communication channels among buyers and sellers. The companies have implemented this e-sourcing for procurement of high-value commodities
The success of SCM solution lies in coordinating the flow of information and goods between the customers and the network of suppliers, manufacturers and distributors. Interestingly, there has been a growing trend of realization of supply chain optimization in India; there is no dearth of SCM solutions in the country. Around 70% of Indian software houses have expertise in SCM. Currently, manufacturing and automotive sectors have been the leaders in implementing SCM solutions in the country.

ROLE OF IT IN AUTOMOBILE SUPPLY CHAIN

IT spending by the manufacturing sector in India, which accounts for 10% of the domestic IT market, is growing between 30 to 40% per annum. The main reasons for this surge in spending on IT by Automobile manufacturing industry are:
a) Indian automobile and auto components companies which are Tier 1 or Tier 2 suppliers to OEMs in India or abroad, to reduce time-to-market and product life cycles, put pressure on manufacturers to integrate with OEMs of both India and other MNCs, Tier-I suppliers, sub-contractors and distributors during product development and process manufacturing;
b) The automobile manufacturing sector wants to improve operational efficiency and capital productivity by reducing fixed and variable costs;
c) Short product lifecycle, rapid customization of products and most importantly growing globalization led to a spurt in IT spending by the automobile sector in India.
There is a huge scope for Indian automobile and auto component manufacturers to reduce their logistics costs with the implementation of SCM solutions. Proliferation of Internet, in particular has made the business easier and cheaper for manufacturers to coordinate their business activities with their suppliers.

CONCLUSION

SCM is a best-in-class, high-performance solution which can be utilized by the every automobile manufacturer, logistics and distribution companies, and automobile dealers/distributors to blend the demand chain with the supply chain. SCM helps in demand forecasting; taking an order; giving an accurate promise date; sourcing and manufacturing the right goods; position inventory properly; pick, pack, and efficient transshipment; most importantly, SCM makes a world of difference to the manufacturers by maintaining a minimal finished goods inventory. To get all the benefits of cost and time the Indian automobile chains has to be integrated to compete with global automobile industry.

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AN EMPIRICAL STUDY OF BRAND PREFERENCE OF MOBILE PHONES AMONG COLLEGE AND UNIVERSITY STUDENTS

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ABSTRACT

With the revolution in telecom sector in India, the mobile phone market is becoming more and more competitive. various companies have launched different handsets of mobile phones in the market. These mobile phones are available at various price range and offer variety of services to the customers. Therefore in the light on increasing competition, it is necessary to study the brand preferences of the potential customers regarding various brands available in the market. In this study the preference of customers about the brands of mobile phones and association between various attributes have been studied. For the analysis of data simple percentage and chi-square test has been used. From the analysis it is found that Nokia is the leader in the market as far as brand of the mobile phone is concerned. the study also reveals that there is close relationship between income of family of respondents and spending on mobile phones and there is no relationship between gender and time period of using mobile phones and gender and frequency of changing the mobile phones.

KEYWORDS

Cellular phone, Chi-square, Cordless phone, Network & Videoconferencing.

INTRODUCTION

Wikipedia defines cellular phone as: The Cellular telephone (commonly "mobile phone" or "cell phone" or "hand phone") is a long-range, portable electronic device used for mobile communication. In addition to the standard voice function of a telephone, current mobile phones can support many additional services as SMS for text messaging, email, packet switching for access to the Internet, and MMS for sending and receiving photos and video. Most current mobile phones connect to a cellular network of base stations (cell sites), which is in turn interconnected to the public switched telephone network (PSTN) the exception is satellite phones. Cellular telephones are also defined as a type of short-wave analog or digital telecommunication in which a subscriber has a wireless connection from a mobile telephone to a relatively nearby transmitter. The transmitter's span of coverage is called a cell. Generally, cellular telephone service is available in urban areas and along major highways. As the cellular telephone user moves from one cell or area of coverage to another, the telephone is effectively passed on to the local cell transmitter. A cellular telephone is not to be confused with a cordless telephone (which is simply a phone with a very short wireless connection to a local phone outlet). A newer service similar to cellular is personal communications services (PCS).

THE GLOBAL CELLULAR MOBILE INDUSTRY

The global mobile phone industry is based on many different manufacturer and operators. The industry is based on advanced technology and many of the manufacturers are operating in different industries, where they use their technological skills, distribution network, market knowledge and brand name. Four large manufacturers of mobile phones are today dominating the d\global mobile phone industry: Nokia, Sony Ericson, Samsung and Motorola. In addition to these companies there are many manufacturers that operate globally and locally.

TELECOMMUNICATION HISTORY IN INDIA

Started in 1851 when the first operational land lines were laid by the government near Calcutta (seat of British power). Telephone services were introduced in India in 1881. In 1883 telephone services were merged with the postal system. Indian Radio Telegraph Company (IRT) was formed in 1923. After independence in 1947, all the foreign telecommunication companies were nationalized to form the Posts, Telephone and Telegraph (PTT), a monopoly run by the government's ministry of Communication. Telecom sector was considered as a strategic service and the government considered it best under state's control.

The first wind of reforms in telecommunication sector began to flow in 1980s when the private sector was allowed in telecommunications equipment manufacturing. In 1985, Department of Telecommunication (DOT) was established. It was an exclusive provider of domestic and long-distance service that would be its own regulator (separate from the postal system). In 1986, two wholly government-owned companies were created: the Videsh Sanchar Nigam Limited (VSNL) for international telecommunications.

Mahanagar Telephone Nigam Limited (MTNL) for service in metropolitan areas. In 1990s telecommunications sector benefited from the general opening up of the economy. Also, examples of telecom revolution in many other countries, which resulted in better quality of service and lower traffic, led Indian policy makers to initiate a change process finally resulting in opening up of telecom services sector for the private sector. National Telecom Policy (NTP) 1994 was the first attempt to give a comprehensive roadmap for the Indian telecommunications sector. In 1947, Telecom Regulatory Authority of India (TRAI) was created. TRAI was formed to act as a regular to facilitate the growth of the telecom sector. New national Telecom Policy was adopted in 1999 and cellular services were also launched in the same year.

Telecommunication sector in India can be divided into two segments: Fixed Service Provider (FSPs), and Cellular Services. Fixed line services consist of basic services, national or domestic long distance and international long distance services. The state operators (BSNL and MTNL), account for almost 90 percent of revenues from basic services. Private sector services are presently available in selective urban areas, and collectively account for less than 5 per cent of subscriptions. However, private services focus on the business/corporate sector, and offer reliable, high- end services, such as leased lines, ISDN, closed user group and video conferencing.

Cellular services can be further divided into two categories: Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA). The GSM sector is dominated by Airtel, Vodafone-Essar, and Idea Cellular, while the CDMA sector os dominated by Reliance and Tata Indicom. Opening up of international and domestic long distance telephony services are the major growth drivers for cellular industry. Cellular operators get substantial revenue from these services, and compensate them for reduction in tariffs on airtime, which along with rental was the main source of revenue. The reduction in tariffs for airtime, national long distance, and international long distance and handset prices has driven demand.

THE KEY PLAYER IN MOBILE MARKET IN INDIA

1. Nokia
2. Motorola
3. Samsung
4. LG
5. Sony Ericsson

FEATURES OF INDIAN TELECOM INDUSTRY

- The telecom industry is one of the fastest growing industries in India. India has nearly 200 million telephone lines making it the third largest network in the world after China and USA.
- With a growth rate of 15 percent, Indian telecom industry has the highest growth rate in the world.
- Much of the growth in Asia Pacific Wireless Telecommunication Market is spurred by the growth in demand in countries like India and China.
- India's mobile phone subscriber base is growing at a rate of 82.2 percent.
- China is the biggest market in Asia Pacific with a subscriber base of 48 percent of the total subscribers in Asia pacific.
- Compared to that India's share in Asia Pacific mobile Phone market is 6.4 percent. Considering the fact that India and China have almost comparable populations, India's low mobile penetration offers huge scope for growth.

OBJECTIVES OF STUDY

The present study was undertaken with the following objectives:

1. To know about the students preferences level associated with different mobile phones.
2. To know the relationship between the gender and time period of using the mobile phone.
3. To know the relationship between monthly income and spending on mobile phones.
4. To know the relationship between gender and frequency of changing the mobile phones.

HYPOTHESIS

HO1 : there is no relation between the gender and tome period of using the mobile phones.
HO2 : There is no relation between income and spending on mobile phones.
HO3 : There is no relation between gender and frequency of changing the mobile phones.

METHDOLOGY

The Present study has been undertaken with the objective to understand the brand preferences of mobile phones among the students as variety of mobile phones are available in the market. The present study is a regional study based on primary data.

SAMPLE DESIGN

The present study brings an empirical investigation; therefore, it deals in depth to all aspects that determine the consumer preference and attitude towards mobile phone in growing mobile phone Industry. We selected the 250 student's city and H.P. University, non-randomly for the purpose of study. There are different methods of selecting the non-random sample, but we have used convenience sampling method to carry out the present study. A well designed questionnaire was prepared for obtaining the required information from the sample units. To analyze the gathered information, we used simple percentage method. To test the given hypothesis chi-square test has been used.

RESULTS AND DISCUSSION

The present study involves the analysis of brand preference of mobile phones among the students of Shimla city. The total sample survey which consisted of 250 respondents was the actual customers of mobile phones. To study the student's preference of different brands of mobile phones the data was collected from three colleges from the city and H.P. University, Shimla.

TABLE 1: DEMOGRAPHIC FEATURES OF RESPONDENTS (N=250)

Particulars	**No. of respondents**	**Percentage**
Nokia	155	62
Samsung	6	2.4
Sony Ericson	34	13.6
LG	22	8.8
Motorola	22	8.8
Others	11	4.4
Time period of using the mobile phone	**No. of respondents**	**Percentage**
Less than 1 year	48	19.2
1-2 year	75	30
2-4 year	56	22.4
Above 4 years	71	28.4
Frequency of changing the mobile phone	**No. of respondents**	**Percentage**
Less than 1 year	59	23.6
1-2 years	88	35.2
2-4 Years	43	17.2
Above 4 Years	60	24
Particulars	**No. of respondents**	**Percentage**
Less than 10,000	142	56.8
10,000 -20,000	86	34.64
20,001 – 40,000	15	6
Any Amount	7	2.8
Particulars	**No. of respondents**	**Percentage**
Nokia	122	48.8
Samsung	43	17.2
Sony Ericson	42	16.8
LG	11	4.4
Motorola	24	9.6
I-Phone	2	0.8
Blackberry	4	1.6
Other	2	0.8

Table 1 makes it clear that tout of 250 respondents 55.6 percent students were male and 44.4 percent were female. The occupation of most of the respondent's family was service, which contributes 43.6 percent followed by business 30.4 percent. Table, also makes it clear that about 40.4 percent respondent's family

income is less than Rs. 15,000 per month and there are only 14.8 percent respondent's who's monthly income is more than Rs. 35,000. Most of Parents of respondents were Post graduates and Graduates. 39.2 percent parents were post graduates ad 35.6 percent were graduates.

TABLE 2: PREFERENCES OF MOBILE USERS REGARDING MOBILE PHONES (N=250)

Name of the mobile Phone	No. of respondents	Percentage
Nokia	155	62
Samsung	6	2.4
Sony Ericson	34	13.6
LG	22	8.8
Motorola	22	8.8
Others	11	4.4
Total	250	100

Table 2 shows that about 62 percent respondent's have Nokia handsets followed by Sony Ericson 13.6 percent, LG and Mororola 8.8% each and Samsung 2.4 percent.

TABLE 3: TIME PERIOD OF USING MOBILE PHONES (N=250)

Time period of using the mobile phone	No. of respondents	Percentage
Less than 1 year	48	19.2
1-2 year	75	30
2-4 year	56	22.4
Above 4 years	71	28.4
Total	250	100

From Table 3, it clear that 30 percent respondent's are using mobile phones for 1 to 2 year, 28.4 percent are using mobile phones for more than 4 years, 22.4 percent are using for 2 to 4 years and 19.2 percent respondent's are using mobile phones for less than one year

TABLE 4: FREQUENCY OF CHANGING MOBILE PHONES (N=250)

Frequency of changing the mobile phone	No. of respondents	Percentage
Less than 1 year	59	23.6
1-2 years	88	35.2
2-4 Years	43	17.2
Above 4 Years	60	24
Total	250	100

About 35.2 percent respondent's claim that they change their mobile phones between 1 to 2 years, 24 percent said that they change mobile phones after 4 years and 23.6 percent said that they change the mobile phones within a period of one year and 17.2 percent respondent's are such that they change mobile phones between 2 to 4 years.

TABLE 5: WILLINGNESS TO PAY FOR PURCHASING A MOBILE PHONE (N=250)

Particulars	No. of respondents	Percentage
Less than 10,000	142	56.8
10,000 -20,000	86	34.64
20,001 – 40,000	15	6
Any Amount	7	2.8
Total	250	100

There are 56.8 percent respondents who do not want to spend more than Rs. 10,000 for purchasing a mobile phone, 34.64 percent are ready to spend Rs. 10, 000 to 20,000 and 2.8 percent are ready to spend any amount for purchasing a mobile phone.

TABLE 6: ADVERTISEMENT MOST LIKED BY THE RESPONDENT'S (N=250)

Particulars	No. of respondents	Percentage
Nokia	122	48.8
Samsung	43	17.2
Sony Ericson	42	16.8
LG	11	4.4
Motorola	24	9.6
I-Phone	2	0.8
Blackberry	4	1.6
Other	2	0.8
Total	250	100

There are 48.8 percent respondents who liked the advertisement of Nokia, 17.2 percent Samsung advertisement 16.8 percent liked the Sony Ericson advertisement.

TABLE 7: CHI-SQUARE ANALYSIS ON THE RELATIONSHIP BETWEEN GENDER AND TIME PERIOD OF USING THE MOBILE PHONE (N=250)

Gender	Less than 1 year	1-2 years	2-4 years	Above 4 years	Total
Male	23	38	32	45	138
Female	25	36	25	26	112
Total	48	74	57	71	250

H0 : there is no significant relationship between the gender and time period of using the mobile phone.

Ha : there is a significant relationship between the gender and time period of using the mobile phone.

O	E	(O-E)	(O-E)2	(O-E)2/E
23	26.5	-3.5	12.25	0.46
38	40.8	-15.8	249.64	0.20
32	31.4	6.6	43.56	0.01
45	39.2	-3.2	10.24	0.86
25	21.5	10.5	110.25	0.57
36	33.2	-8.2	67.24	0.24
25	25.5	19.5	350.25	0.01
26	31.9	-5.9	34.81	1.06
			E	3.41

X2 = ∑ (O-E)2 / E = 3.41
Number of degree of freedom = (row-1) (column-1)
= (2 - 1) (4 - 1)
= 3
Table valve of X2 at 5 percent level of significant = 7.8
Thus calculated X2 is less than tabulated X2, 3.41 < 7.8. So we will accept null hypothesis that is there is no significant between gender and time period of change the mobile phones.

TABLE 8: CHI-SQUARE ANALYSIS ON THE RELATIONSHIP BETWEEN MONTHLY INCOME AND SPENDING ON MOBILE PHONES (N=250)

Income/Spending Amount	Less than 1000	10000 to 20000	20000 to 40000	40000 & above	Total
Less than 15000	66	27	4	4	101
15000-25000	35	23	3	0	61
25000-35000	29	20	1	2	52
35000 & above	10	18	7	1	36
Total	140	88	15	7	250

H0: There is no significant relationship between income and spending on the mobile phones.
Ha: There is a significant between the income and spending on the mobile phones.

O	E	(O-E)	(O-E)2	(O-E)2/E
66	56.56	9.44	89.11	1.58
27	35.55	-8.55	73.14	2.06
4	6.06	-2.06	4.24	0.70
4	2.83	1.17	1.37	0.49
35	34.16	0.84	0.71	0.02
2	21.47	1.53	2.33	0.11
3	3.66	-0.66	0.44	0.12
0	1.71	-1.71	2.92	1.71
29	29.12	-0.12	0.01	0.00
20	18.304	1.70	2.88	0.16
1	3.12	-2.12	4.49	1.44
2	1.456	0.54	0.30	0.20
10	30.16	-10.16	103.23	5.12
18	12.672	5.33	28.39	2.24
7	2.16	4.84	23.43	10.85
1	1.008	-0.01	0.00	0.00
			E	26.78

X2 = ∑ (O-E)2 / E = 26.78
Number of degree of freedom = (row-1) (column-1)
= (4 - 1) (4 - 1)
= 9
Table valve of X2 at 5 percent level of significant = 16.92
H0 is rejected since the calculated value of X2 (26.78) more than the table value of X2 (16.92) hence there is a significant relationship between income & spending on mobile phones.

TABLE 9: CHI-SQUARE ANALYSIS ON THE RELATIONSHIP BETWEEN GENDER AND FREQUENCY OF CHANGING THE MOBILE PHONES (N=250)

Gender	Less than 1 year	1-2 years	2-4 years	Above 4 years	Total
Male	38	45	23	33	139
Female	21	43	20	27	111
Total	59	88	43	60	250

H0: There is no significant relationship between income and frequency of changing the mobile phones.
Ha: There is a significant between the income and frequency of changing the mobile phones.

O	E	(O-E)	(O-E)2	(O-E)2/E
38	32.8	5.2	27.04	0.82
45	48.92	-3.92	15.37	0.31
23	23.9	-0.9	0.81	0.03
33	33.36	-0.36	0.13	0.00
21	26.2	-5.2	27.04	1.03
43	39.07	3.93	15.44	0.40
20	19.09	0.91	0.83	0.04
27	26.64	0.36	0.13	0.00
			E	2.65

X2 = ∑ (O-E)2 / E = 2.65
Number of degree of freedom = (row-1) (column-1)
= (2 - 1) (4 - 1)
= 3
Table valve of X2 at 5 percent level of significant = 7.8
H0 is accepted since the calculated value of X2 (2.65) less than the table of X2 (7.8) hence there is no significant relationship between gender and frequency of changing the mobile phones.

CONCLUSION AND IMPLICATIONS

At present, in Indian mobile phone industry, Nokia s the market leader followed by Sony Ericson, LG and Motorola. About 80 percent of mobile users are using mobile phones for more than a year and about 60 percent of respondents accepted that they change their mobile sets within a period of 2 years. There are 56.8 respondents are such that they do not want to spend more than Rs. 10,000 for purchasing a mobile set and only 2.8 percent are ready to spend any amount for buying a mobile phone. At the same time 48.8 percent of respondents liked the Nokia advertisement.

The study also revealed that there is no relationship between the gender and time period of using the mobile phone. Form the study it is evident that there is significant relationship between the income and frequency of changing the mobile phones. Lastly the study reveals that there is no relation between the gender and frequency of changing mobile phones.

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ICT IN BANKING SECTOR: DISASTER AND RECOVERY OF INFORMATION

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ABSTRACT

ICT is playing big role in the banking industry. Information technology has graduated from being a business enabler to a business driver. Banks store enomorous amount of information. It is a big task for the banks to protect the information. Banks needs to invest heavily in the protection of information and most of the banks are working for this.ICT industry is finding solutions for the avoidance of disaster and giving solution for the recovery of information in case of loss of information. There are various factors responsible for the disaster of data. It include environmental, technical disaster, human mistake etc. Banks can take extra steps to avoid and recover from disaster.

KEYWORDS

ICT, Banking industry, Reasons for disaster, Disaster recovery planning.

INTRODUCTION

Information Management is increasingly becoming the very core of banking operations. As more and more financial transactions are conducted without the use of currency, it is only information that is exchanged instead of real money. Electronic banking makes use of the Internet, ATMs, mobiles and a number of other devices, which already have changed the face of banking. Information is clearly one of the more important assets of a bank. It has to be protected to establish and maintain trust between a bank and its customers, even as it complies with, and demonstrates compliance to regulations. Information technology has graduated from being a business enabler to a business driver. Information security is a key function of an organization that enables other business functions to perform their activities effectively. Information security objectives continue to be confidentiality, availability, integrity of information; with accountability and assurance that can be demonstrated.

Banking and Information Technology can hardly be separated. This is one such industry, which not only depends on the technology, but where technology has contributed to its immense development and proliferation. It may not be untrue to conclude that the effectiveness of technology implemented at a bank could determine its profitability and growth potential. Since most of the business operations can simply be accomplished with information exchange, the need to protect integrity of information is of paramount importance. This is why security has to be part of the service delivery and an important hygiene, rather than being a point of differentiation.

The unique aspect about information security in banking industry is that the security posture of a bank does not depend solely on the safeguards and practices implemented by the bank; it is equally dependent on the awareness of the users using the banking channel and the quality of end-user terminals. This makes the task for protecting information confidentiality and integrity a greater challenge for the banking industry.

NEED FOR DATA RECOVERY SOLUTIONS

An insider's view on the state of information management in the Indian Banking sector and the need for a strong Disaster Recovery Management (SRM) strategy in the space.

We are in the 21st century, and it is not surprising that we have moved ahead in terms of economy, technology and globalization. If one could sit and analyze the radical transformation from the past to present, it is quite astonishing. There was a time where one had to manage all the personal and official data manually and undoubtedly, it took up a lot of time. This is not the case in the present scenario, where time and work are digitally driven. Globalization has been both – key in expanding the opportunities available to Banking sectors, and tough in the face of competition, especially with recent economic concerns.

We have email, photos, songs and few documents in our server for easy access, but what about the rest of the important information? Banking details, passport, driving license, income tax and insurance details and other important documents which are essential for your business.

The banking industry is perhaps on the forefront of using IT enabled services; almost all listed banks and several mid-cap banks have deployed IT applications for core banking. Core banking enables the bank to offer customer services anywhere across the globe. The Reserve Bank of India, the regulatory body for banks has set up mandates to deploy disaster recovery and business continuity plan and ensure that all banks have access to the risk management solutions. Going forward, banks have to demonstrate compliance to RBI's mandate once in six months. Most of the banks have a primary location where their IT applications run and they also have an alternate site, like any other city where they have the capability to bring up their IT applications if the primary site goes down. Data which includes customer account details are replicated from the primary site to the alternate site on a regular basis. Closely linked are the securities market, buying or selling shares will have a DMAT account. The stock exchange is sustained and driven by IT applications. The market regulator for the stock market is the Securities and Exchange Board of India (SEBI). SEBI follows regulations which would require depositories who participate in the market to demonstrate their risk management system including the disaster recovery capabilities of IT applications.

A major part of the disaster recovery planning process is the assessment of the potential risks to the organization which could result in the disasters or emergency situations themselves. It is necessary to consider all the possible incident types, as well as and the impact each may have on the organisation's ability to continue to deliver its normal business services.

THREAT TO DATA

Part of the risk process is to review the types of disruptive events that can affect the normal running of the organization. There are many potential disruptive events and the impact and probability level must be assessed to give a sound basis for progress. To assist with this process the following list of potential events has been produced:

ENVIRONMENTAL DISASTERS

- Tornado
- Hurricane
- Flood
- Snowstorm
- Drought
- Earthquake
- Electrical storms
- Fire
- Subsidence and Landslides
- Freezing Conditions
- Contamination and Environmental Hazards
- Epidemic

ORGANIZED AND / OR DELIBERATE DISRUPTION

- Act of terrorism
- Act of Sabotage
- Act of war
- Theft
- Arson
- Labour Disputes / Industrial Action

LOSS OF UTILITIES AND SERVICES

- Electrical power failure
- Loss of gas supply
- Loss of water supply
- Petroleum and oil shortage
- Communications services breakdown
- Loss of drainage / waste removal

EQUIPMENT OR SYSTEM FAILURE

- Internal power failure
- Air conditioning failure
- Production line failure
- Cooling plant failure
- Equipment failure (excluding IT hardware)

SERIOUS INFORMATION SECURITY INCIDENTS

- Cyber crime
- Loss of records or data
- Disclosure of sensitive information
- IT system failure

OTHER EMERGENCY SITUATIONS

- Workplace violence
- Public transportation disruption
- Neighbourhood hazard
- Health and Safety Regulations
- Employee morale
- Mergers and acquisitions
- Negative publicity
- Legal problems

Although not a complete list, it does give a good idea of the wide variety of potential threats.

DISASTER RECOVERY PLANNING

Banks and Credit Unions of all sizes rely on information technology as a crucial component of their day-to-day operations. Since data availability is a top priority, the need for financial institutions to compile a thorough disaster recovery plan is essential. Banks should have recovery time objective which consists of efforts from people, processes and infrastructure. What ever recovery planning will be, it comprises of these three prime factors.

PLAN FOR DISASTER RECOVERY PLANNING

1. **Devise a disaster recovery plan:** IT disaster recovery planning can be a daunting undertaking, with many scenarios to analyze and options to pursue. It is important to start with the basics and add to the plan over time. To begin, define what is important to keep the bank or credit union running - i.e., email and application access, database back-up, computer equipment - and the "recovery time objective" or how quickly the company needs to be up and running post-disaster. Other key plan components to consider are determining who within the organization declares the disaster, how employees are informed that a disaster has occurred, and the method of communication with customers to reassure them that the company can still service their needs.
2. **Monitor implementation:** Once a disaster recovery plan has been established, it is critical to monitor the plan to ensure its components are implemented effectively. A disaster recovery plan should be viewed as a living, breathing document that can and should be updated frequently, as needed. Additionally, proactive ongoing monitoring and remediation of processes, such as back-up data storage and data replication, results in fewer IT issues and less downtime should a crisis occur.
3. **Test disaster recovery plan:** A 2007 eWeek survey of more than 500 senior IT professionals revealed that a whopping 89% of companies test their disaster recovery/failover systems only once per year or not at all, leaving their enterprises vulnerable to massive technology and business failures in the event of a disaster. An under-tested plan can often be more of a hindrance than having no plan at all. The ability of the disaster recovery plan to be effective in emergency situations can only be assessed if rigorous testing is carried out one or more times per year in realistic conditions by simulating circumstances that would be applicable in an actual emergency. The testing phase of the plan must contain important verification activities to enable the plan to stand up to most disruptive events.
4. **Perform off-site data back-up and storage:** Any catastrophe that threatens to shutter a business is likely to make access to on-site data back-up impossible. The primary concerns for data back-up are security during and accessibility following a crisis. There is no benefit to creating a back-up file of valuable data if this information is not transferred via a secure method and stored in an offsite data storage center with fool proof protection. As part of establishing a back-up data solution, every company needs to determine its "recovery point objective" (RPO) - the time between the last available back-up and when a disruption could potentially occur. The RPO is based on tolerance for loss of data or reentering of data. Every company should back-up its data at least once daily, typically overnight, but should strongly consider more frequent back-up or "continuous data protection" if warranted.
5. **Perform data restoration tests:** Using tape back-up for data storage has been integral to IT operations for many years, however this form of back-up has not been the most reliable. Today, disk to disk systems are gaining popularity. With either type of system, the back-up software and the hardware on which it resides needs to be checked daily to verify that back-up is completed successfully and that there are no pending problems with the hardware. With tape back-up, companies need to store the tapes in an off-site location that is secure and accessible, while disk systems need to have an off-site replication if the back-up is not run off-site initially. Moreover, companies need to perform monthly test restoration to validate that a restoration can be accomplished during a disaster.
6. **Back-up laptops and desktops:** Although many companies have policies requiring employees to store all data on the company's network, it is not prudent to assume that the policy is being followed. Users often store important files on local systems for a host of reasons, including the desire to work on files while traveling and the need to protect sensitive data from the eyes of even the IT staff. Backing up laptops and desktops protects this critical data in the event of a lost, stolen or damaged workstation. Using an automatic desktop and laptop data protection and recovery solution is ideal.
7. **Be redundant:** Establishing redundant servers for all critical data and providing an alternate way to access that data are essential components of an organization's disaster recovery planning. Having these redundant services in place at a secure, offsite location can bring disaster recovery time down to minutes rather than days.
8. **Invest in theft recovery and data delete solutions for laptops:** IDC reported that more than 70% of the total workforces in the U.S. were to be considered mobile workers by 2009. Accordingly, laptops are increasingly replacing the traditional desktop PCs. Unlike desktops, however, laptops are more easily misplaced or stolen, thus requiring organizations to secure data deletion and theft recovery options for their users' laptops. Theft recovery solutions can locate, recover and return lost or stolen computers, while data delete options can enable companies to delete data remotely from lost or stolen computers thereby preventing the release of sensitive information.
9. **Install regular virus pattern updates:** IT infrastructure is one of those realities of business life that most companies take for granted. Companies often do not focus on email security until an incipient virus, spyware or malware wreaks havoc on employees' desktops. Organizations need to protect its data and systems by installing regular virus pattern updates as part of disaster recovery planning, which may even help prevent a crisis from happening.
10. **Consider hiring a managed services provider:** For small- to medium-sized businesses, it is often cost prohibitive to implement a sound disaster recovery plan. Frequently these organizations lack the technical professionals to accomplish this. Managed services providers (MSPs) have emerged in recent years to perform this role. MSPs have the technical personnel to design, implement and manage complex disaster recovery projects. Additionally, MSPs have the server, storage and network infrastructure in place to manage a true disaster recovery plan. To keep costs manageable and make disaster recovery services, such as data storage and redundant servers, available to small- to medium-sized businesses, MSPs build shared, multi-tenant IT infrastructures that host multiple companies on the same hardware and network equipment which helps keep costs affordable and advantageous for its customers.

CONCLUSION

Disaster recovery will continue to evolve with the banking industry. As banks become more sophisticated technology users, disaster recovery solutions will follow.But banks must plan for disaster recovery every step of the way. The key to successful disaster recovery is what happens long before a disaster strikes. With a realistic recovery plan, properly tested and committed to by senior management, banks can effectively maintain operations while providing for the safety of people and assets.

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CREDIT CARDS AND ITS IMPACT ON BUYING BEHAVIOUR: A STUDY WITH REFERENCE TO RURAL MARKET

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ABSTRACT

The launching of credit card is indeed one step future in meeting the social objectives expected of today's banking. It is treated as a status symbol and as a vehicle of consumerism, India banks spurned this business till recently as did not go along very well with the spirit of authority and saving which they were expected to promote. But with increasing economic and financial liberalization and growing prosperity of the urban middle class, banks feel it desirable to enter this line of business. As of now, so many banks are in the field besides the non-banking institutions. In India almost major banks are issuing the credit card. Initially, the credit card was created to help the customers for their local small purchases to the merchants. Late on, credit card has become predominant, the means for consumer to obtain goods and services. In this background this article is designed to test the impact of credit card on buying behavior in general and customers from rural market in particular.

KEYWORDS
Credit Cards, Rural Market.

INTRODUCTION

Thirty years ago people paid by cheque or cash, for their purchases. They did not have an alternative until payment cards entered the market. Payment cards over these 3 decades have become an integral part of our lives and economy. The possibilities are amazing it can be used for travel, food and commodities or simply cash. Today owning a payment card opens up a whole new world of opportunities.

OBJECTIVES OF THE STUDY

The objectives set out below promoted to undertake the study.

- To understand the conceptual framework of credit cards.
- To explore the various areas of usage.
- To know the opinion of the respondents about credit cards.
- To study the cardholders and their buying behaviours in general.

IMPORTANCE OF THE STUDY

The ever growing demand for money and the present study focus on the opinion of card holders about credit cards and how far the need of the individual is satisfied with its usage by them, especially on buying behaviour.

LIMITATIONS OF THE STUDY

The main limitations of the study may be state as follows:

- The study is based on the opinion of the individual credit cardholders.
- The area covered for the study is rural market in Tambaram block.
- The respondent's bias noticed during the survey may slightly influence the findings of the study.

EVALUATION OF CREDIT CARD

The origin of credit card has been traced to John C.Biggins, a consumer credit specialist at the Flatbush National Bank of Brooklyn, New York. In 1946, Biggins launched a credit plan called Charge-it. The programme featured a form of scrip that was accepted by local merchants for small purchases. The merchant deposited the scrip in their bank account after the sale was completed and the bank billed the customer for the total scrip is issued.

In 1950, Dinners club and American Express launched their charge cards in USA, the first "plastic money". In 1951, Diners Club issued the first credit card to 200 customers who could use it at 27 specified restaurants in New York continued until the establishment of standards for the magnetic strip in 1970. The credit card became part of the information age.

The proliferation of credit card soon revealed a big drawback of the payment system. Cardholders could shop only in their geographic area. The merchants only with their bank were able to sign up. Bank of America overcame this difficulty. Bank of America began forming licensing agreement with a handful of bank outside California to issue the Bank Americard, later in 1976 changes its name of Visa. This arrangement worked well for banks that obtained the BankAmericard license. However, many banks were left out. In 1966, 16 banks were together in Buffalo, New York, to form their own network. That association was called as Inter-bank Card Association, which was the grand father of master Card International, as known today.

Credit card assesses a customer's financial resources. Credit card may also be categorized as general purpose or proprietary. General-purpose credit card can be used at any merchant. Proprietary, or limited purpose, card are tied to the retailer and can be used only in the retailer's stores. Credit cards are form of consumer loan, a revolving credit account that has a credit limit of a specific amount and that can be repaid in full or part of it. The available credit limit is restored and it can be used again, when once the outstanding balance is paid. Initially, the credit card was created to help the customers for their local small purchases to the merchants. Later on, credit card has become predominant, that means for consumers to obtain goods and services.

TABLE NO. 1: DISTRIBUTION OF RESPONDENTS ACCORDING TO EDUCATION AND OCCUPATION

Occupation / Level of Education	Govt		Private		Self. Employed		Others		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
No formal Edu.	0	0	0	0	20	66.6	10	33.3	**30**	**15**
School Edu.	20	50	2	5	6	15	12	30	**40**	**20**
Graduation	46	76.6	4	6.67	8	13.3	2	3.33	**60**	**30**
Post Graduation	20	50	20	50	0	0	0	0	**40**	**20**
Prof./Technical	14	47	10	33	6	20	0	0	**30**	**15**
Total	**100**	**50**	**36**	**18**	**40**	**20**	**24**	**12**	**200**	**100**

Source: Primary Data

This table shows the relationship of the education with the occupation of the card holders in the study area.

Out of the respondents considered 100 respondents are in Government service, of which 20 respondents have the school education, 46 respondents have the graduation, and 20 respondents have completed the post graduation. And only 14 respondents are professionally qualified.

In the study area, 40 respondents are self employed, of which 20 respondents have no formal education, 6 respondents has school education, graduated respondents are 8, professionally qualified respondents are 6.

The third category of employment is private sector employees. This accounts 36 respondents. Out of that, one has school education, 4 respondents are graduated, 20 are post graduated, and 10 are professional qualified. 24 respondents are in other category of employment. In general it is confined that more credit card holders are in government service and graduate.

TABLE NO. 2: DISTRIBUTION OF RESPONDENTS ACCORDING TO NAME OF THE CARD AND SOURCES OF AWARENESS

Sources of Awareness / Name of the Card	Advertisement		Marketing Representative		Friends & Relatives		Others		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
ICICI	34	34	34	34	20	20	12	12	**100**	**50**
SBI	20	33	30	50	4	6.7	6	10	**60**	**30**
Citi Bank	5	50	6	30	4	20	0	0	**20**	**10**
HDFC	4	40	4	40	2	20	0	0	**10**	**5**
Others	2	20	6	60	0	6	2	20	**10**	**5**
Total	**70**	**35**	**80**	**40**	**30**	**15**	**20**	**10**	**200**	**100**

Source: Primary Data

This table makes an attempt to find out the reason and sources for getting the awareness about the credit cards in the study area.

Out of the total 200 card holders it is observed that, marketing representatives are the entire principle source for getting information's about the credit cards. This is opted by 80 respondents out of which 34 persons are having ICICI cards, 30 respondents are having SBI cards, 6 persons each for Citibank card and other type of cards. Only 4 respondents are having HDFC cards. This position has occurred, only ICICI and SBI Card Companies are having the direct office to market their credit cards in the study area.

Advertisement is the next important factor to know about credit card. In this also maximum respondents are belonging to ICICI, which are 34 in numbers. SBI has 20 card holders, Citibank has 10 card holders, other are least in the area.

Among the respondents, 30 respondents are aware about the card through their friends and relatives. In this also ICICI is the market leader; it is hold by 20 respondents.

On the whole, it is concluded that, ICICI is the major role player in the study area and direct marketing representatives are the principal sources for getting the information's.

TABLE NO.3: DISTRIBUTION OF RESPONDENTS ACCORDING TO ANNUAL INCOME AND PERIOD OF USAGE

Annual Income / Period of Usage	Up to Rs.100000		Rs.100001 to Rs.300000		Rs.300001 to Rs.500000		Rs. 500000 and Above		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 1 year	14	23	20	33	16	26	10	16	**60**	**30**
1 to 3 years	24	24	50	50	20	20	6	6	**100**	**50**
3 to 5 years	6	20	8	26	2	6.67	14	47	**30**	**15**
5 years & above	4	40	2	20	2	20	2	20	**10**	**5**
Total	**48**	**24**	**80**	**40**	**40**	**20**	**32**	**16**	**200**	**100**

Source: Primary Data

This table highlights the levels of annual income with the period of usage. The purpose for the construction of this table is, the period of usage of the credit card explains the depth of the operation in the market if it is correlated with the annual income.

Among the respondents considered, 60 respondents are using the card for less than 1 year, on this 14 respondents has the income up to Rs.100000, 20 respondents has the income level for Rs.100001 to Rs.300000. The income portion lying in Rs.300001 to Rs.500000 has 16 respondents and 10 respondents are in the category of income more than Rs.500000. The major respondents are in the category of 1 to 3 year. In this, 24 respondents have the income up to Rs.100000, 50 respondents is having the income of Rs.100001 to Rs.300000, 20 respondents has the income category of Rs.300001 to Rs.500000 and 6 respondents has the income of above Rs.500000. 30 respondents are using the card for 3 to 5 years, in this 14 respondents are having the income of above Rs.500000. Only 10 respondents are using the card for more than 5 years.

TABLE NO. 4: DISTRIBUTION OF RESPONDENTS ACCORDING TO OPINION ABOUT BUYING BEHAVIOUR

Responses / Name of the Card	Strongly Agreed		Agreed		Disagreed		Strongly Disagreed		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
ICICI	6	6	92	92	2	20	0	0	**100**	**50**
SBI	16	27	34	57	10	17	0	0	**60**	**30**
Citi Bank	4	20	14	70	2	10	0	0	**20**	**10**
HDFC	2	20	6	60	2	20	0	0	**10**	**5**
Others	0	0	4	40	2	20	4	40	**10**	**5**
Total	**28**	**14**	**75**	**75**	**18**	**9**	**2**	**2**	**200**	**100**

Source: Primary Data

The above table shows the response of the card holders about the buying behaviour. The ultimate purpose of having is to use the credit card instead of carrying the cash.

Among the respondents surveyed, majority of respondents, i.e. 50 respondents have agreed that their card helps them for influencing the buying behaviour. Of which 92 respondents are holding ICICI cards, 34 are having SBI cards. So major card holders in the study area has accepted their cards help them for promoting the buying behaviour.

In this study area, 28 respondents have opinioned that, they strongly agreed about their card helps them of improving the buying behaviour. On that, 16 respondents are holding SBI, 6 are having ICICI, 4 respondents of Citi bank card, and only one respondents of HDFC also prefer the response.

Further to this, 18 respondents has disagree that, there card helps them for buying behaviour. Of which 10espondents are SBI card holders. Only 2 respondents each have preferred other type of cards and HDFC. This situation happens because of the acceptability of their cards in the market. Only 4 respondents of other

type of card have strongly disagreed about the question of buying behaviour. The reason for this position is only ICICI and SBI cards have established their depth in the market.

TABLE NO.5: DISTRIBUTION OF RESPONDENTS ACCORDING TO FREQUENCY OF USAGE AND VALUE OF USAGE

Frequency of Purchase	Once in a Month		Twice in a Month		Thrice in a Month		More than Thrice		Total	
Value of Usage	No.	%	No.	%	No.	%	No.	%	No.	%
Up to Rs.4000	10	45	10	45	2	9	0	0	**22**	**11**
Rs.4001to s.6000	8	29	10	36	6	21	4	14	**28**	**14**
Rs.6001 to Rs.8000	6	20	10	33	8	27	6	20	**30**	**15**
Rs.8001 to Rs.10000	20	50	16	40	4	10	0	0	**40**	**20**
Rs.10001 and Above	26	33	20	25	4	5	30	38	**80**	**40**
Total	**70**	**35**	**66**	**33**	**24**	**12**	**20**	**20**	**200**	**100**

Source: Primary Data

The above table indicates the relationship of value of purchase with the frequency of usage of the card in the study area.

Out of respondents in the surveyed area, 70 respondents are using the card for only once in month, moreover, 20 respondents are belong to the purchase value group of Rs.8001 to Rs.10000, 26 respondents are having the purchase value of Rs.10001 and above. And other categories of purchase value levels are having only lower level respondents. The next position is occupied by 66 respondents who are using the cards twice a month. In this level major respondents, 16 are having the income level Rs.8001 to Rs.10000 and 26 respondents are having the purchase value Rs.10001 and above.

The cardholders comprising 40 respondents are using the credit cards for more than thrice a month. On this, 30 members are having the purchase value of Rs.10001 to above, 6 respondents has the purchase value of Rs.6001 to Rs.8000, 4 respondents are having a middle group purchase value of Rs.4001 to Rs.6000.

In general this table exhibits that, more level of cardholders are using the card once or twice a month. Because their purchase value and annual income level is also low.

TABLE NO. 6: DISTRIBUTION OF RESPONDENTS ACCORDING TO OCCUPATION AND TYPE OF CREDIT CARD

Name of the Card	Master		Visa		Others		Total	
Occupation	No.	%	No.	%	No.	%	No.	%
Salaried								
– Public/Govt.	30	30	46	46	24	24	**100**	**50**
– Private	20	55	12	33	4	12	**36**	**18**
Self Employed	20	50	16	40	4	10	**40**	**20**
Others	16	67	8	33	0	0	**24**	**12**
Total	**86**	**43**	**82**	**41**	**32**	**16**	**200**	**100**

Source: Primary Data

The distribution of sample according to occupation and type of credit card shows that, 50 percent of the respondents belong to salaried – public or government category, of this 30 percent are using Master card, 46 percent are using Visa card and the remaining 24 percent of the respondents use other type of cards. 18 percent of the respondents belong to salaried – private sector, of this 55 percent are using Master card, 3 are using Visa care and the remaining 12 percent of the respondents use both Master and Visa card. 20percent of respondents belong to self employed professionals, of this 50 percent are using Master card, 40 percent are using Visa card and the remaining 10 percent of the respondents use both Master and Visa cards. The remaining 12 percent of the respondents belong to other category, of this 67 percent are using Master card, 33 percent are using Visa card. The table also indicates that the respondents constituting 43 percent are holding Master card, respondents constituting 41 percent are holding Visa card and the remaining respondents constituting 16 percent are holding both Master and Visa cards.

TABLE NO. 13: DISTRIBUTION OF RESPONDENTS ACCORDING TO INCOME AND CREDIT LIMIT

Income	Credit Limit						Total	
	0-20000	%	20000-40000	%	40000-60000	%	No.	%
0-100000	30	15	18	9	0	0	**48**	**48**
100000-200000	48	24	20	10	0	0	**68**	**68**
200000-300000	20	10	20	10	12	6	**52**	**52**
300000-400000	8	8	6	3	8	4	**22**	**22**
400000-500000	0	0	6	3	4	2	**10**	**10**
Total	**106**	**53**	**70**	**35**	**24**	**12**	**200**	**200**

Source: Primary Data

This table is analyzing the level of income and the credit limit extended by the card issuing companies.

In the study area, 48 respondents are having the income level of up to Rs.100000 lacks, in that 30 respondents are having credit limit of up to Rs.20000 and 18 respondents has a credit limit of Rs.20000 to Rs.40000.

The income level of Rs.10000 to Rs.200000 has the 68 respondents, in this 48 respondents has the lower credit limit of up to Rs.20000 and 20 persons are in the limit of Rs.20000 to Rs.40000.

In the next position, 52 persons are this category. Their income level is Rs.200000 to Rs.300000. This comprises 10 persons are having the credit limit up to Rs.20000, 20 persons having the limit of Rs.20000 to Rs.40000 and 32 persons are having the limit of Rs.40000 to Rs.60000.

The next income level of Rs.300000 to Rs.400000 is having it respondents of which it consists 8 persons are having the limit up to Rs.20000, 6persons are having Rs.20000 to Rs.40000 and 8 persons are lying in the category of Rs.40000 to Rs.60000.

In this, high income group people are only 10 persons. Their income level is Rs.400000 to Rs.50000. It consists of 6 persons are having the limit of Rs.20000 to Rs.40000 and 4 persons are having the higher limit of Rs.40000-Rs.60000.

So, it is observed that lower income group respondents are availing lesser credit limit and income level is the major criterion for having credit limit.

TABLE NO. 13: DISTRIBUTION OF SAMPLE ACCORDING TO INCOME AND MONTHLY PURCHASE

Income	Monthly Purchase								Total	
	2000-4000	%	4000-6000	%	6000-8000	%	8000-10000	%	No.	%
0-100000	36	18	8	4	0	0	4	2	**48**	24
100000-200000	44	22	10	5	6	3	8	4	**68**	34
200000-300000	22	11	10	5	12	6	8	4	**52**	26
300000-400000	6	3	8	4	4	2	4	2	**22**	11
400000-500000	2	1	4	2	0	0	4	2	**10**	5
Total	**110**	**55**	**40**	**20**	**22**	**11**	**28**	**14**	**200**	**200**

This table explains the relationship of income and the monthly purchase of the credit card holders in the study area.

Out of the respondents considered 48 respondents are having the income level up to Rs.100000. On this 36 respondents are having the purchase value of Rs.2000-Rs.4000, 8 respondents are having the purchase capacity of Rs.4000 to Rs.6000 and only 4 respondents are lying in the level of high purchase capacity.

The income level of Rs.100000 to Rs.200000 is occupied by 68 respondents. On this 44 respondents are having low purchase capacity, 10 respondents are lying in the level of Rs.4000 to Rs.6000, and 6 respondents have the purchase capacity of Rs.6000 to Rs.8000. High purchase capacity is selected by 4 respondents.
52 respondents are comes under the income level Rs.200000 to Rs.300000. In this maximum number of respondents are having only low purchase capacity.
Out of the respondents, only 10 respondents are in the high income group, and they are having the purchase capacity of Rs.8000 to Rs.10000.
Hence it is concluded that the study has more level of medium and low income group peoples, high income group persons are very low in number. The credit cards are used for more value of purchase only by the persons having high income

CONCLUSION

Credit card, which was considered to be a luxury, has become a necessary. Credit card was considered to be used by higher income group. Among the various financial services rendered by commercial banks and other financial institutions extending their credit card facility to customers is an important modern day function. This facility is extended not only to customers in urban areas or cities, but also to customers residing in rural area. But today, with development on banking and trading activities, the fixed income group or salaried classes are also started using the same. There may be the criticism that, it induces for more purchases or make people spendthrift. This may be so in the initial stage, but when once a customer gets used to the credit card, they will know how to use the same in a discretionary manner.

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EMERGING APPLICATIONS AND SECURITY FOR VoIP: A STUDY

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ABSTRACT

In this paper we mentioned about voice over internet protocol and their emerging technologies for their applications security. Service providers and enterprises expect voice over Internet Protocol (VoIP) to enable third-party secure application development, which allowing them to network mix-and-match best-of-breed VoIP secures application from multiple vendors who providing such types of emerging technologies for secured network. By taking advantage of applicable techniques employed for Web-based services, service broker functionality deployed in the network will provide a framework for specifying VoIP application interaction rules. However, each unique VoIP deployment will require development of a complex, customized, domain-specific set of interaction rules for the service brokers. The complexity of VoIP application interaction rule development in a multi-vendor environment will provide Lucent with an opportunity to sell application integration services to enterprises and service providers.

KEYWORDS
VoIP, Broker, IETF.

INTRODUCTION

One of the most compelling drivers of voice over Internet Protocol (VoIP) is the potential it offers for third-party application development. Cost savings alone may not be compelling enough to drive VoIP deployment beyond niche markets, but VoIP service architectures also enable development and deployment of best-of-breed applications from multiple vendors, encouraging a greater degree of innovation by more competitors and driving down total cost of ownership. Just as with Web-based services, however, integration of applications from multiple vendors will require a significant, complex, unique effort to properly integrate the applications into a seamless user experience. Consider, for example, a case in which a user has subscribed to service with two separate application servers. If one application believes that all calls should be diverted to voice mail and another application believes that all calls should be forwarded to the user's wireless phone, which service gets its way and how is that determination managed? Will the applications be attempted serially, in which case the first one asked wins? Which should be asked first? Will the applications be attempted in parallel, in which case they may recommend different treatment? What are the criteria to determine which treatment to apply? The answer may be as simple as declaring that one application always takes precedence over another, or it may be a complex set of rules that relies on criteria like the time of day or what activity is indicated in the user's calendar.

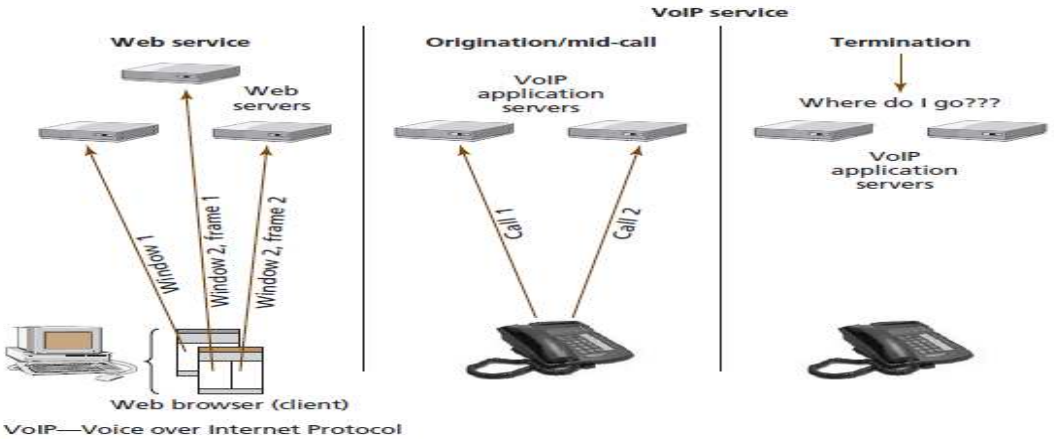
APPLYING WEB-BASED TECHNIQUE TO VoIP ENVIRONMENTS

In order to understand how application integration can be accomplished for VoIP, it is helpful to examine the mechanisms used for Web-based services and their applicability to VoIP. There are, essentially, two models for managing content from multiple Web servers simultaneously: separate non-interacting sessions and custom-designed/configured software. They are discussed in the following subsections.

DIFFERENT NON-INTERACTING SESSIONS

Separate non-interacting sessions is a method of rendering content from multiple Web-based services in separate windows, frames, or channels. Typically, the service providing the content must be selected explicitly by the user; in the case of frames and channels, it may be implied by the user's explicit selection of a service in the parent window. To apply this method to VoIP, we would consider the phone as the client and the call as a session. This implies that, if this technique were to be used for VoIP, there would be only one application server per call and the user would have to specify which application server to use for each call. This approach, however, will not provide a service that meets subscribers' expectations. If a user is subscribed to abbreviated dialing and least-cost routing, the user will not want to have to explicitly choose between those services based upon the context of the call. The user will expect that the phone system will apply the appropriate routing service, based upon dialed digits. Users expect most terminating features, such as call waiting, call diversion, and distinctive alerting to be applied automatically, but with this model, there is no opportunity for the user to specify which service should handle any given call. It should be noted that the Internet Engineering Task Force (IETF) is defining a framework to facilitate user interfaces with multiple servers but that framework does not address application interaction management.

FIGURE – 1: DIFFERENT NON-INTERACTING SESSIONS



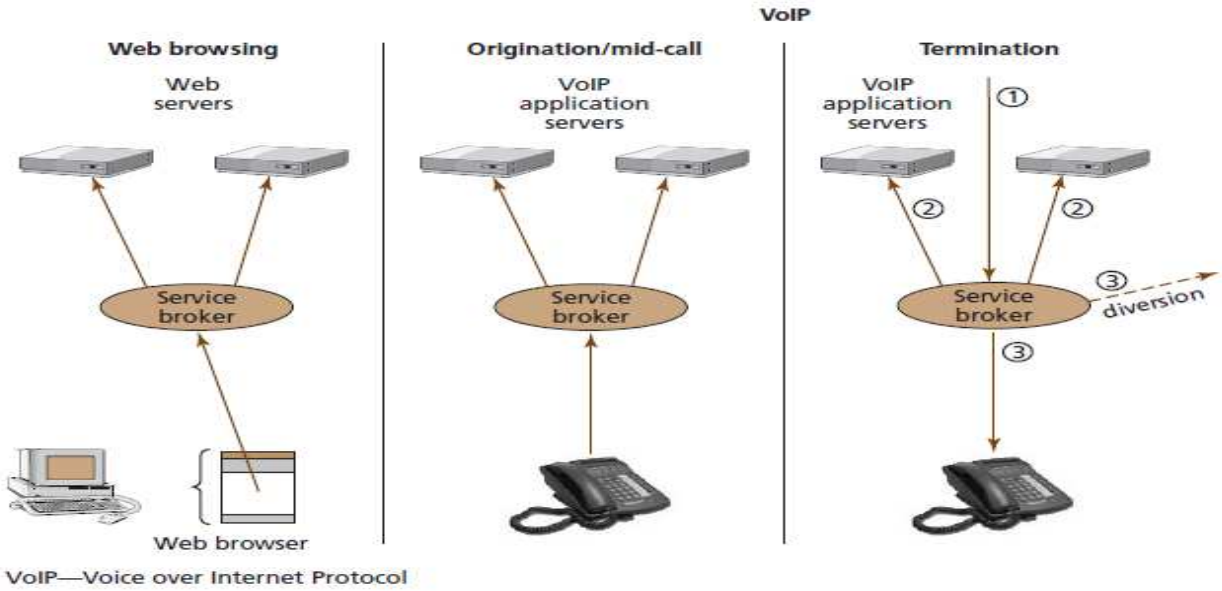
CUSTOM DESIGN SOFTWARE

The other method of rendering content from multiple Web-based services is to deploy intermediary software that embodies customized, domain-specific interaction rules. The software may reside within an endpoint, within an application server, or in an intermediary device, and it may be a custom-developed application or a customized configuration of an off the shelf product. Standards bodies, industry consortiums, and product vendors have developed—and are continuing to develop—frameworks for specification and communication of interaction rules, but each unique set of Web services requires a unique, creative effort to determine its interaction rules. To apply this model to VoIP, the intermediary software, referred to as a service broker, must contain a set of rules to determine which service should be invoked under which circumstances and how interactions should be managed. Origination and mid-call services would flow through the service broker, who would determine which additional services should be engaged in the network and manage the interactions between them. Termination attempts would initially be delivered to the service broker, which would engage the appropriate network services, based on the interaction rules, to determine if, where, and how the call should be delivered.

APPLICATIONS SERVICE INTEGRATIONS

A VoIP service broker may be custom-built to manage the interaction among a specific set of applications, or it may provide a framework in which to specify domain-specific interaction rules. For service brokers that provide a framework in which to specify interaction rules, each unique deployment requires a unique, creative effort to determine those rules. The rules for the telephony application interaction examples used above.

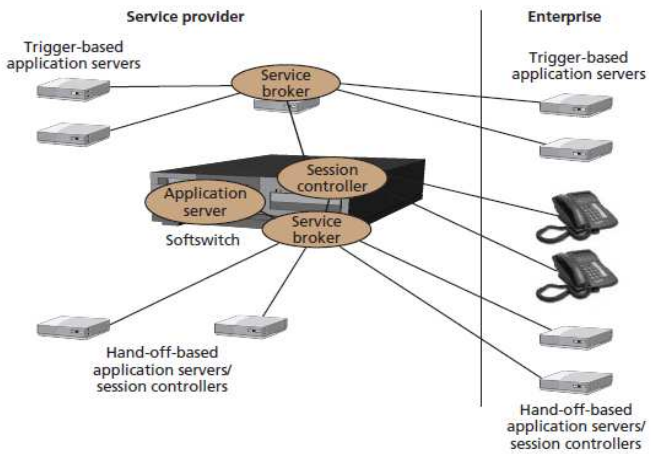
FIGURE-2: CUSTOM DESIGNED SOFTWARE



The complexity of the rule set grows exponentially. There is additional complexity, as well, in the fact that the service broker is a logical concept that may be broken into multiple tiers, residing on different physical boxes, accessed via multiple protocols, and owned and controlled by different business entities. A service broker function may reside in a session controller/soft switch platform, or it may reside in a separate application server that brokers between other application servers.

Figure 3. Shows a fairly complex environment that is more representative of real-life deployments. In this example, some applications reside in the soft switch and some reside in application servers. This soft switch makes it possible to specify complex rules for determining the termination point, so it can act as a service broker by handing off calls to multiple call-based application servers via interfaces such as Session Initiation Protocol. This soft switch also supports a trigger-based interface via JAIN, Parlay, or Transactional Capabilities Application Part (TCAP), but it assumes that all triggers are being delivered to one application server. That application server must act as the service broker for all other trigger-based application servers. The fact that, in an Internet Protocol Centrex environment, some application servers may be owned and operated by an enterprise, which implies that every enterprise served, may require unique engineering in the service provider's network. The expectation that every enterprise will have the same set of services available and that they will all be provided and managed by the service provider misses the point that enterprises want VoIP because it gives them the ability to rapidly deploy new services that integrate into their unique business operations environment.

FIGURE-3: COMPLEX DEPLOYMENT ENVIRONMENT



In all cases, however, it will require a unique solution design activity to identify the customer's functional requirements, ascertain the capabilities, interfaces, gaps, and overlaps within the target product set, and determine the most appropriate methods to manage interactions. The service offering could also take advantage of generic service broker frameworks currently being researched by Bell Labs.

CONCLUSION AND FUTURE SCOPE

Service providers and enterprises chose to invest in VoIP because they believed that it would facilitate fast-to-market, cheap-to-develop, simple-to-integrate, best-of-breed applications from multiple vendors. Most, however, are still mired in get-started issues like equipment installation/configuration and network design/trouble-shooting, and they do not yet recognize the complexity of the interaction management that will be required to realize the end goal of their investment. Service brokers deployed in the network will provide a framework for managing interaction between multiple application servers, but they will require service providers and enterprises to develop domain specific interaction rules for each unique deployment. As VoIP deployments mature, Lucent will have an opportunity to address the third-party application expectation gap by providing a professional services portfolio to determine the set of application interaction rules and realizing those rules by deploying and engineering service broker functionality in the network.

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SUCCESSION PLANNING IN INDIAN BANKING SYSTEM: A STUDY CONDUCTED AMONG BANK OFFICERS OF COIMBATORE

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ABSTRACT

Succession planning system is used to track high potential employees in an organization for career planning. The researcher has taken an effort to understand and develop an insight on succession planning system in banking system of India. The research intentions include the assessment of promotion facilities and career advancement prevailing in the organisation. It also caters to the future developments in succession planning by analyzing the pitfalls of the present succession planning from the respondents so as to give the succession planning system a global visibility for the aspiring young talented employees of the organisation that have been chosen for the study. A survey research has been done among the bank employees in the Coimbatore District and the implications of the research have brought out employees' expectations for their career progress and subsequently that would help the organizations to give some specific opportunities to the aspiring employees to determine their succession choices.

KEYWORDS

Succession Planning, Talent Assessment, Promotion, job satisfaction, carrerplanning.

INTRODUCTION

Succession planning systems is the creation of a pool of high potential employees that receive specific training and developmental opportunities with the intention of promotion. Organizations that follow succession planning has lot of significant benefits including Standardize, automate, and optimize succession planning. It also facilitates senior management with global visibility into the talent pipeline. It creates overall bench strength by leveraging dynamic talent pools and could help in advanced analytics process, practices across the organization. It equips the system to discover talent, including high performers, deep within the organization to ensure proper retention strategies are in place. It helps in driving engagement by providing career paths for all employees, not just senior management only. It eyes on retaining high performers and infuse fresh ideas into organization by promoting talent mobility. The succession planning system could create as well as establish learning and training plans to strengthen the bench. It also integrates succession planning to broader HR and talent functions for maximum effectiveness.

The global survey of HR leaders conducted by soft scape indicates that the succession planning is currently the least automated talent management process. Almost 67% of companies that employ a succession planning process are still primarily paper based. Within the majority of organizations, today's succession planning efforts are characterized by fragmented, inconsistent, paper-based processes. Conventionally, HR practitioners will spend weeks or months manually scouring different parts of the organization for information needed to build lists and pools of nominees and successors for specific job positions. Similarly, a critical consideration for the succession decision is the opportunity to enhance the diversity of the senior executive team. Several executives cautioned that relying too much on the hierarchy to identify likely successors (replacement planning) severely limits opportunities to enhance senior management diversity in the major finding as reported by practitioners and researchers.

REVIEW OF LITERATURE

(Gorne, 1998; Levitt, 2005; Miller, 1998; Ross, 2004). Historically, succession planning focused on the transitions within family owned businesses, For the past 10 years, succession planning has become a major initiative within many organizations, Succession planning has been practiced more systematically in a large number of organizations at levels beyond just senior management . It helps Succession planning for the organizational actions how the talent persons prepared to the next position.

(Garman & Glawe, 2004). Succession planning has been practiced more systematically in a large number of organizations at levels beyond just senior management. In fact, estimates suggest that 40% to 65% of companies have implemented a succession planning process .As a caveat, it should be noted that the samples for the Garman and Glawe research were from previous studies that had limited scope in terms of diversity of businesses.

(Hewlett & Luce, 2005). Recent articles have focused on planning for CEO succession keeping talented women on the path for future leadership positions refer to as "building the leadership pipeline."

(Nyce & Schieber, 2001). Across many disciplines, researchers have struggled to understand the conditions that facilitate individuals fully engaging their will when taking certain actions. In the context of work, this evolved to how do organizations fully engage their employees so that they can contribute their maximum value. In the shift from the Industrial Age to the Knowledge Age, organizations have struggled more with how to fully engage employees in their work

(Axelrod et al., 2000). In addition to a reduction of talented employees, In order to fully appreciate why succession planning has become such a substantial priority for organizations, it is essential to understand how top management is viewing talent. As previously discussed, managers feel that it is becoming increasingly difficult to attract and retain talented employees the importance of qualified managers is magnified. In a survey of 410 executives at companies in the United States, the best 20% of managers were estimated to increase productivity by 40%, increase profit by 48%, and increase sales revenue by 67%

Demographics are also changing the way in which organizations conceptualize the work force. The baby boomers, a large demographic group of individuals born between 1946 and 1964, are becoming eligible for retirement

(Chambers, Foulon, Handfield-Jones, Hankin, & Michaels, 1998). As our countries economy grows It is more complex for employees (i.e.) due to the industrial development to face the challenges, there will be also in the demand for the more sophisticated employee who posses global business, technical literacy, multiculturalism, and entrepreneurialism. For that succession planning helps to retain the key talented person in the organisation.

(Collins & Porrass, 1997; Guthridge, Komm, & Lawson, 2006). In sum, because high quality managers have more economic impact and are becoming more difficult to find, managing talent is an increasingly high priority for organizations. Many organizations are addressing this challenge through the process of succession planning.

(Rothwell& Friedman, 2002). The organizational strategy must drive how the organization approaches managing talent and the succession process. For example, an organization that is strategically attempting to double in size over the next 10 years will need to plan for the accelerated development and back filling of positions as employees move to these newly created positions. In contrast, an organization more intent on maintaining its position in the market place, will need to plan for succession from the standpoint of normal attrition and retirements of key position holders. As with many organizational initiatives, senior leadership support is crucial

(Ciampa et al., 2005 et al) There have been tremendous discussion in the business literature regarding how to build a strategic workforce and succession planning has often emerged as the answer In fact, to some, succession planning is the only answer. In the bestseller *Built to Last*, the authors refer to a culture of succession planning not only as a habit of visionary companies, but the unifying factor.

OBJECTIVE OF THE STUDTY

1. To analyse factors influencing the difference in opinion between the managers and subordinates towards succession planning.
2. To analyse factors influencing the difference in opinion between the male and female employees towards succession planning

HYPOTHESIS

H1: There is no significant difference of the mean scores of Succession planning among the managers & subordinates
H2: There is no significant difference in the mean scores of Succession planning among the male and female employees.

RESEARCH METHODOLOGY

The study has a descriptive research design. Area of the study includes public, private, globalized bank in Coimbatore district. It is finite population; the population size in the top management level is 1050.
25 banks have been selected using simple random sampling. The size of the sample is 97 top and middle level officers in the banks of Coimbatore.

SAMPLING FRAME

From the Public, Private and Globalized Bank ,Using simple random sampling 25 banks has been selected .From each bank through quota sampling method 1top level manager and 3 middle level managers totally 25 managers and 72 subordinates were selected .Finally a sample size of 97 has been arrived.

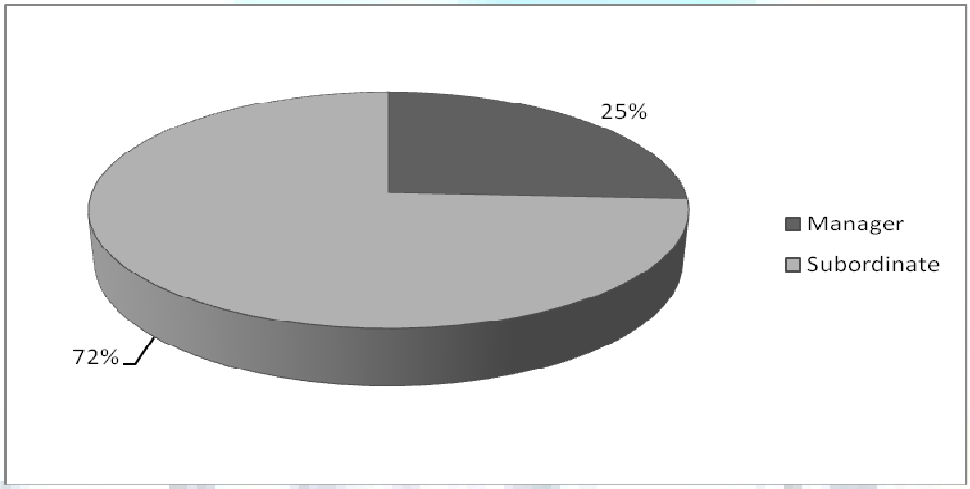
TOOLS USED

1. Percentage analyses was applied to find the level of their occupation.
2. T-test was applied to find the mean score of succession planning among Managers&Subordinates.
3. T-test was applied to find the mean score of succession planning of Male&Female Respondents.
4. Correlation was applied to find the relationship between the opinion of the Top level and the middle level managers.

ANALYSIS AND FINDINGS

The percentage of the respondents among the bank employees with the level of their occupation.

CHART - 1



From the chart among 97 employees from the selected sample and 25% were the Managers and 72% were the Sub-ordinates.

TABLE -1: SUMMARY OF T-TEST WITH MEAN SCORES OF SUCCESSION PLANNING AMONG MANAGERS & SUBORDINATES

Statements	Groups	Mean	t-value	Sig(2 tailed)	Remark
At my department my performance of the job is evaluated fairly	Managers Subordinate	.765 1.017	.876	.192	Accepted
I have some control over what I am supposed to accomplish	Managers Subordinate	.718 .990	.562	.182	Accepted
my supervisor seems to care about me as a person	manager Subordinate	.725 1.026	.247	-.587	Accepted
I am satisfied with the advancement of promotion oppurtunities in my organisation	**manager Subordinate**	**.608 .880**	**.431**	**.004****	**Rejected**
I have to do things that done differently	manager Subordinate	.792 .651	.899	-.356	Accepted

**** Significant at 0.05 level**

Ho1 There is no significant difference opinion towards Succession planning among the managers and subordinates

Table: 1 reveals there is significant difference among managers and subordinates with their opinion in advancement, promotion oppurtunities. This is the evident from the table. In these cases, the mean score of subordinate opinion is found to be better than managers. Hence Subordinates are more satisfied in the advancement oppurtunities than manager.

TABLE 2: SUMMARY OF T-TEST WITH MEAN SCORES OF SUCCESSION PLANNING MALE &FEMALE RESPONDENTS

Statements	Groups	Mean	t-value	Sig(2 tailed)	Remark
At my department my performance of the job is evaluated fairly	**Male Female**	**.721 .654**	**1.033**	**.422****	**Rejected**
I have some control over what I am supposed to accomplish	Male Female	.871 .612	-.419	.676	Accepted
my supervisor seems to care about me as a person	Male Female	.888 .654	-.643	.522	Accepted
I am satisfied with the advancement of promotion oppurtunities in my organisation	Male Female	1.066 1.042	-.010	.992	Accepted
Overall I am satisfied with my organization	Male Female	.839 .999	-.784	.435	Accepted
I have to do things that done differently	Male Female	.700 .651	-.220	.826	Accepted

**** Significant at 0.05 level**

Ho2 There is no significant difference opinion for succession planning among the male and female employees.

Table: 2 Reveals there is significant difference for their opinion among male and female employees, towards evaluation of performance Hence Null Hypothesis Ho2 is rejected in these cases. The mean score of female is found to be higher than male. Hence females are highly satisfied with the evaluation of job performance than male.

TABLE 3: TO FIND THE RELATIONSHIP BETWEEN THE OPINION OF THE TOP LEVEL AND THE MIDDLE LEVEL MANAGERS

Statement	Correlation coefficient of managers & subordinates
At my department my performance of the job is evaluated fairly	.140
I have some control over what I supposed to accomplish	-.226
My supervisor seems to care about me as a person	-.316
I am satisfied with the advancement of promotion opportunities in my organisation	-.050
Overall I am satisfied with my organization	.075
I have to do things that done differently	.225

From the above table they have negative relationship & positive relationship.

The respondents reveal that their performance has been evaluated fairly and they drive overall satisfaction with their organization. They say that there is room for creative ideas. The indifference in opinion on the factors care from superiors, promotion oppurtunities in the organization etc between superiors and subordinates.

IMPLICATION OF THE STUDY

There is significant difference exist among managers and subordinates regarding their career planning system and satisfaction towards the promotion facilities. There is also difference in the opinion among male and female respondents towards the evaluation of their job performance. Hence there is also negative correlation on the select items(I have some control over what I supposed to accomplish, My supervisor seems to care about me as a person & I am satisfied with the advancement of promotion opportunities in my organisation) between the opinion of top level managers and the middle level managers for succession planning.

FINDINGS & SUGGESTION

1. Among 97 employees from the selected sample and 25% were the top level managers and 72% were the middle level managers.
2. From the analyses there is Significant difference exist among the of opinion managers and subordinates in their promotion and the career advancement facilities.
3. From the analysis there is Significant difference exists among the male and female respondents towards their evaluation of the job performance.
4. Among all statements in these three statements (I have some control over what I am supposed to accomplish, My supervisor seems to care about me as a person & I am satisfied with the advancement of promotion opportunities in my organisation) they have difference in the opinion among the top level managers and the middle level managers.

SUGGETIONS

1. The banking sector should improve the promotion facilities, career advancement facilities and the evaluation of job performance.
2. They are also satisfied with respect given by the top management and the care towards the subordinates.
3. Frequently updating lists of high potentials based on project-based performance, and basing succession decisions on a diverse pool of candidates.
4. The succession planning system could create as well as establish learning and training plans to strengthen the bench. It also integrates succession planning to broader HR and talent functions for maximum effectiveness.

CONCLUSION

The study focussed on the insight of the succession planning system among the bank officers. Hence the Bank employees has high influence for succession planning system and ensure a flexible and fluid succession planning process by avoiding their apparent designations, They are not satisfied with the evaluation of job performance, promotion facilities. Frequently updating lists of high potentials based on project-based performance, and basing succession decisions on a diverse pool of candidates, ensure active manager participation in the organization's method of identifying and codifying high potential employees.

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A CONCEPTUAL STRUCTURE FOR KNOWLEDGE MANAGEMENT MODEL IN HIERARCHICAL DISTRIBUTED ENVIRONMENT: CASE STUDY OF KNOWLEDGE SHARING AMONG DIFFERENT GOVERNMENT ORGANIZATION WORKING FOR PLANNING AND FACILITATING WATER RESOURCES IN UTTARAKHAND STATE

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ABSTRACT

Knowledge management is the process of transforming information and intellectual assets into enduring value and Knowledge sharing is a social action involving the collective behavior of a group of people. However, prior research on knowledge predominately focused on individual behavior. Furthermore, previous studies did not capture the multiple facets of this group behavior. In this paper we proposed a conceptual structure for knowledge sharing model in distributed environment. Furthermore there is a brief discussion on how a mature process of knowledge sharing in ad-hoc system of government departments can improve efficiency of planning and policy making with case study of water departments in Uttarakhand. Attention is drawn to the need of an integrated model of knowledge sharing among different government departments as well as other organization dealing with water sources.

KEYWORDS

Knowledge Management, Group Behavior, ad-hoc System, Uttarakhand, Water Sources.

INTRODUCTION

Knowledge is increasingly recognized as the basic requirement for organization to gain working potential. Organizational knowledge is the collective sum of tacit and explicit knowledge within an organization. Acquiring knowledge and managing knowledge is an emerging requirement of electronic world. In order to manage the knowledge it is required to define it. The definition of knowledge adopted here is "information combined with experience, context, interpretation, and reflection. It is a high-value form of information that is ready to apply to decisions and actions" [Albert and Bradley, 1997] . Knowledge management is the process of continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities. It is a systematic process of analysis, capture, defining and optimization of organization's knowledge economics. Its overall purpose is to maximize the organization's knowledge related effectiveness and returns from its knowledge assets and to renew them constantly. Alavi [4] suggests that one of the biggest reasons for focusing on knowledge sharing is that knowledge creation by itself cannot lead to superior performance for the organization. Rather, companies have to create value by using that knowledge, and knowledge can only be utilized if it is shared successfully. Therefore, organizations have to effectively manage knowledge transfer process to obtain success. Knowledge sharing may be challenging due to a number of factors, including the type of knowledge, and an inability to locate and access the required knowledge source [4]. We argue that this sharing process must be boosted among different organizations sharing same knowledge domains. Exploring knowledge is a modeling activity. For a successful start to KM, an organization should engage in a clear understanding of how, and where, knowledge is developed. Knowledge management systems are powerful tools for this purpose. Different sources are analyzed. The findings resulted in a framework for KM (Figure 2). The four main building blocks of the framework are presented in the following diagram.

Figure 1: *Knowledge Management System*

RESEARCH METHODOLOGY

The research described in this paper aims to concentrate on knowledge definition, branches and degree of usage in inter-organization. To achieve our main research goal, we employed a two phase research strategy in this paper. At first, we used knowledge derived from an analysis of KM Literature in order to propose our conceptual model for inter-organization knowledge management system. The model covers aspects referring to knowledge "for", "from" and "about" in depth. Therefore, the phase provides us with suitable framework for our case study in the second phase. This second phase consist of an explanatory case study of different government organizations dealing with water resources in Uttarakhand.

RESEARCH FINDINGS

Nonaka [1] proposes that new organizational knowledge can be created through four conversion processes that involve tacit and explicit knowledge: socialization, externalization, combination and internalization. Knowledge is an important asset that allows obtaining and retaining competitive advantage. For this reason knowledge sharing has become a strategic priority for most organizations. Knowledge sharing is extremely important because organizations have to continually learn and innovate to remain competitive. According to several authors, the interplay between the individual and collective knowledge is an important aspect of organizational knowledge creation, amplification, and sharing.

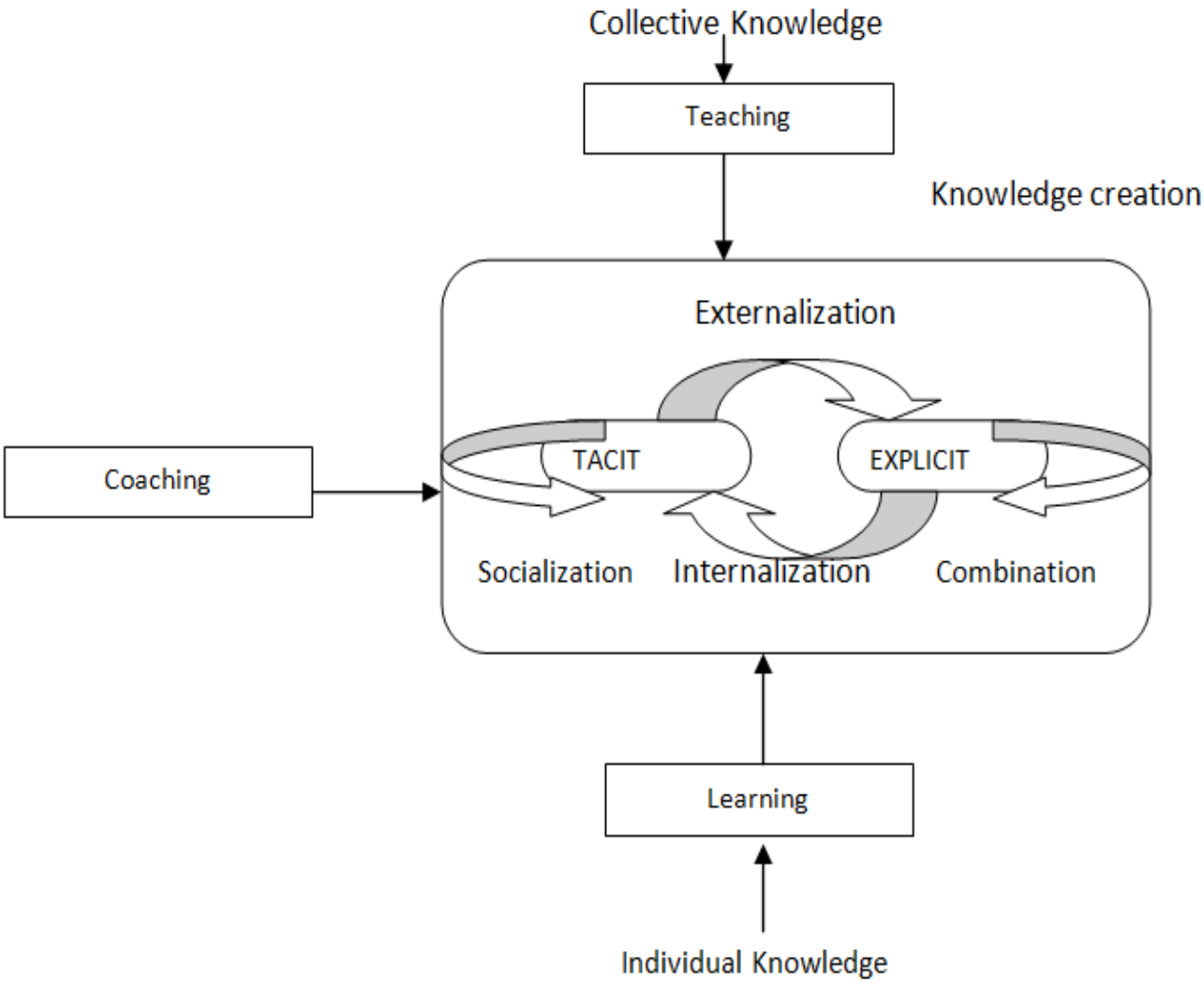

Figure 2: Knowledge Creation

Information systems literature makes a difference between data, information and knowledge [3] elaborated on the disparities:
"Data is a set of discrete, objective facts about events. In an organization context, data is described as structured records of transactions. Information is data endowed with relevance and purpose. It is a message with a sender and a receiver. Information is meant to change the way the receiver perceives something, to have an impact on his judgment and behavior. It must inform. Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information."[2].
We argue that knowledge which plays an important role in organizations growth is distributive and hierarchical in nature and interplay of knowledge management in inter-organization system is modeling of concepts, expertise's, experiences of individuals and groups of experts at different levels of organization . E-Gov. can play a vital role in knowledge sharing in government organization.

CONCEPTUAL MODELING FOR HIERARCHICAL AND DISTRIBUTIVE SYSTEM

Conceptual modeling is a technique that helps to clarify the structure of a knowledge-intensive business task. The knowledge model of an application provides a specification of the data and knowledge structures required for the application. The model is developed as part of the analysis process. The knowledge model does not contain any implementation-specific terms. These are left for the design and implementation phase. In this section we are going to explain an important part of this study- theoretical conceptual model we created through literature. In our conceptual model we divided Domain knowledge (what aspect of knowledge) experts according to organization's hierarchies and modeled task/inference knowledge (how aspect of model) interplay in distributed inter-organization system. We grouped individuals with experiences and expertise with different aspects related to same domain in same level of organizations hierarchy and knowledge sharing between different organization is will be done at corresponding levels of organizational hierarchy . We believe that knowledge about organization involves basic info like name of department, no. of resources, information about resources, authorities of department and policies of deptt. . Knowledge from organization is most important part as it will consist task knowledge or inference knowledge about domain. Knowledge for organization is domain specific knowledge which will be internal as well as external. Internal knowledge is tactic and explicit knowledge both. While external knowledge will be gathered through different knowledge assets as well as interplay of knowledge among organization about common knowledge domain.

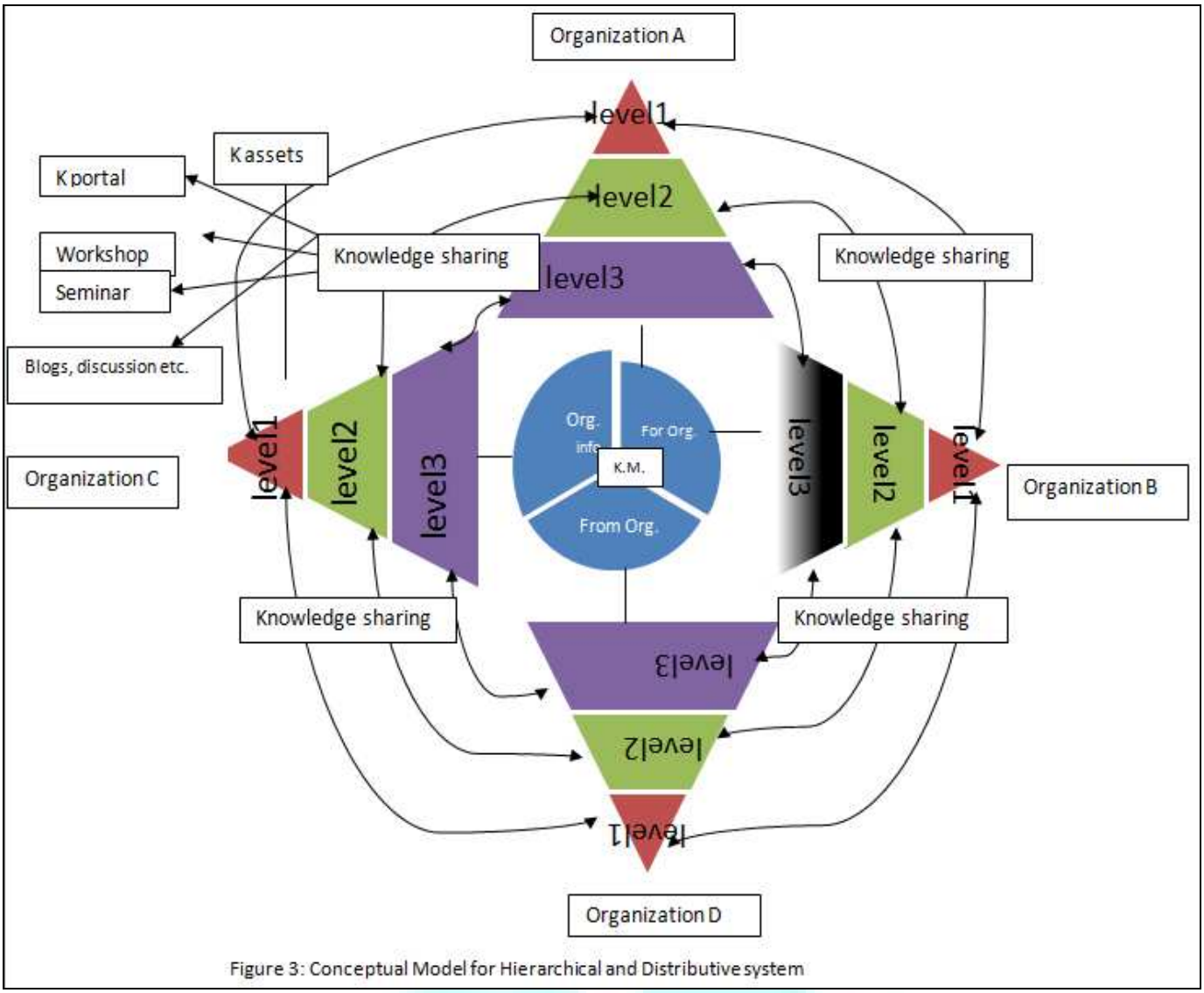

Figure 3: Conceptual Model for Hierarchical and Distributive system

CASE STUDY

The following case demonstrates utilization of conceptual model for hierarchical distributed system. There are six departments in Uttarakhand at present dealing with water resources but working under different administrative control in the government and as well despite of all e-government practices there is no common knowledge base related to water resources of state. Due to this reason, the water resource planning for different purposes falls mostly into the abyss of dispute causing bottlenecks in the pace of development. To establish synchronization, information and knowledge base all the water resource agencies irrigation department, minor irrigation department, watershed management directorate, Jal Vidyut Nigam, Peyjal Nigam and Jal Sansathan should be brought under single umbrella knowledge management system.

We propose inter and intra department both type of knowledge sharing. Intra department knowledge sharing can be in same level as well as groups at different levels of organizational hierarchy while inter department KT will be at corresponding levels of hierarchy i.e. village to village level, tahsil to tahsil, district to district level. Now, next question about management of shared knowledge of experts from different organizations? E- Gov. efforts can play a vital role for this purpose. Knowledge shared among different level i.e. block, Tahsil, District and state level through different knowledge assets will be managed under a common KMS. Uttarakhand currently faces huge water scarcity mainly due to unsystematic distribution of water as well as poor management of water resources and such efforts can help to get by situations.

CONCLUSION

The success of an organization lies more in its intellectual and systems capabilities than in its physical assets. The importance of KM application in real world problems will continue being increased in the coming years. As a result of the research effort, we proposed our theory of combining knowledge management concept with E-Gov. efforts for increasing efficiency of distributed environments

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A DNA-BASED ALGORITHM FOR MINIMUM SPANNING TREE PROBLEM USING TEMPERATURE GRADIENT TECHNIQUE

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ABSTRACT

The biological deoxyribonucleic acid (DNA) strand is found to be a promising computing unit. In this paper, the thermodynamic properties of DNA have been utilized along with other biochemical operations to obtain the minimum spanning tree (MST). Actual distance values are represented using the thermodynamic properties of DNA. All possible Euler cycles of the different spanning trees of the problem are first generated. From this generated Euler cycle, the MST is obtained. Moreover, the proposed approach can be adopted to solve many real-life applications like broadcasting and scheduling problems, with necessary modifications.

KEYWORDS

DNA computing, Euler cycle, Euler path, spanning tree, temperature gradient.

INTRODUCTION

Ever since Adleman (1994) has published a paper on molecular computation for solving Hamiltonian Path Problem (HPP), attempts are being made to utilize DNA manipulations for solving computationally difficult problems. Narayanan and Zorbalas (1998) had solved shortest path problem using constant proportional length-based DNA computing technique, in which, a constant increase of DNA strands in length is encoded according to the actual length of the distance. Yamamoto *et al.* (2002a and 2002b) have proposed a concentration-controlled DNA computing for accomplishing a local search for the shortest path problem. Ibrahim *et al*. (2004) have presented another approach for solving shortest path problem using direct-proportional length-based DNA computing, in which the length of the strand goes very long when the weight of the edge goes high. Lee *et al*. (2004) have presented a DNA computing technique based on temperature gradient for solving the TSP problem. Representation of weight information for weighted-graph problem is one of the most important yet challenging problems. Han *et al.* (2008) proposed DNA algorithm for the minimum spanning tree in which the length of the strands depends upon the number of vertices and the weight. In this paper, the melting temperature of a DNA strand is used to represent numerical values. For each vertex and each unique distance, a fixed-length DNA strand has been assigned.

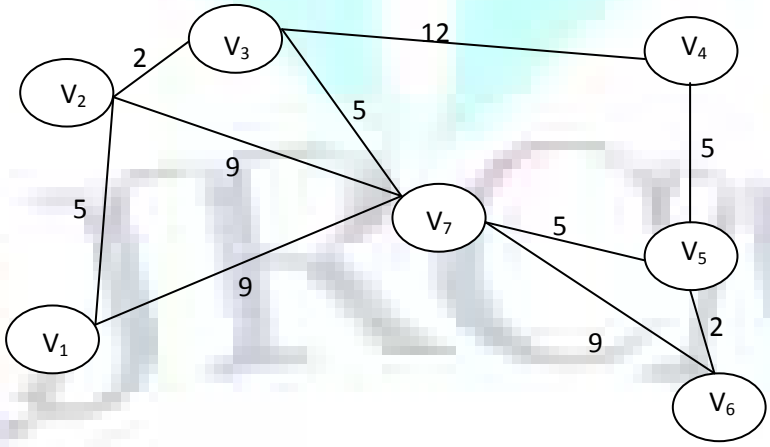
The rest of the paper is organized as follows: Section 2 describes the MST and basic operations on DNA. Section 3 gives the proposed DNA encoding method for the MST. Section 4 presents the complete biomolecular algorithm for solving the MST. Section 5 gives the outcome of the DNA computation and conclusions are given in Section 6.

PRELIMINARIES

MINIMUM SPANNING TREE PROBLEM

Given a connected undirected weighted graph, $G = (V, E, W)$ where V is the set of vertices, E is the set of edges between the vertices and W is a mapping, $W: E \rightarrow R$, R being set of real numbers. Spanning tree of graph G is a subgraph of the graph G which is an undirected tree containing all the vertices. Minimum spanning tree of a connected undirected weighted graph $G = (V,E,W)$, is a spanning tree with minimum weight. In this work, an instance with seven vertices is considered throughout as shown in *Fig.1*. Every vertex represents a particular location and edges represent the roads between the vertices and weight represents the distances between any two vertices. The objective of the problem is to find MST of the graph $G = (V, E, W)$.

FIG. 1: THE GRAPH CORRESPONDING TO 7 VERTICES



CHEMICAL OPERATIONS ON DNA

It is well established that DNA encodes the genetic information of cellular organisms. DNA consists of strands viewed as a chain of nucleotides or bases. The four bases are adenine, guanine, cytosine and thymine, which are abbreviated as A, G, C and T. Each strand, according to chemical convention, has a 5' and 3' ends. Bonding occurs by the pair-wise attraction of bases, and hydrogen bonds are formed between a pair of bases. This forms the base pair (bp). G bonds with C and A bonds with T. Operations can be performed on DNA strands, namely denaturing, annealing, ligation, polymerase chain reaction (PCR), gel electrophoresis and cloning.

DENATURING AND ANNEALING

Denaturing is disintegrating the double-stranded DNA into two single strands by heating the solution. Annealing is the reverse of denaturing. Here, the solution of single strands is cooled (hybridized), allowing complementary strands to become bound together.

LIGATION

In double-stranded DNA, if one of the single strands contains a discontinuity (ie, one nucleotide is not bound to its neighbour) then this can be repaired by DNA ligase.

GEL ELECTROPHORESIS

Gel electrophoresis is a technique used to sort DNA strands by length. Electrophoresis is the movement of molecules in a charged field. DNA carries a negative charge, so it tends to be attracted to the anode. If the strands are allowed to move in a gel, strands move at a rate that is proportional to their length. Longer strands move slowly than the shorter strands, because of the porous nature of the gel.

TEMPERATURE GRADIENT GEL ELECTROPHORESIS (TGGE)

TGGE is a gel electrophoresis method, which operates by correlating the melting characteristic of a DNA strand to its electro-migration. Electrophoresis starts with double-stranded molecules. The DNA starts to melt at a certain temperature resulting in a fork-like structure. In this conformation, the migration is slowed down compared with a completely double-stranded DNA fragment. DNA fragments of the same size but different sequence as the melting temperature strongly depends on the base sequence. Thus, TGGE not only separates molecules, but also gives additional information about melting behaviour and stability. TGGE is an extremely sensitive method, and so it can detect even point mutation. TGGE is a sequence-dependent and size-independent method.

PCR

Polymerase chain reaction or PCR is another method for amplifying DNA. PCR is a process that quickly amplifies the amount of DNA in a given solution. Each cycle of the reaction doubles the quantity of each strand, giving an exponential growth in the number of stands.

DENATURE TEMPERATURE GRADIENT PCR (DTG-PCR)

This is a modified PCR method, in which the denaturation temperature changes with each cycle. The cycle begins with the temperature of 70^{o}C as the denaturation temperature. Then, the denaturation temperature is gradually increased by 18^{o}C for every cycle. This process is carried out until it reaches to 95^{o}C. The temperature 95^{o}C is maintained for the rest of the cycle. The other procedures for amplifying the DNA strands are the same as PCR.

MELTING TEMPERATURE

The melting temperature (Tm) of an oligonucleotide is the temperature at which 50% of the oligonucleotide and its perfect complement are in duplex. In this work, two methods are employed to calculate the melting temperature. One is the GC content method, in which the content of G and C are the main factors for determining the melting temperature. GC content method is applicable for strands longer than 50 nucleotides. The second method is the nearest-neighbour (NN) model, in which the thermal stability of a DNA strand is calculated based on the identity and orientation of neighbouring base pairs. This method is accurate for DNA strands up to 108 bp.

EULER GRAPH AND EULER CYCLE

In a graph G, a Euler path is a path that visits each edge exactly once. A Euler cycle is a Euler path that starts and ends on the same vertex.

SPANNING TREE

A spanning tree T of a connected, undirected graph G is a tree composed of all the vertices and some (or perhaps all) of the edges of G. Informally, a spanning tree of G is a selection of edges of G that form a tree spanning every vertex.

PROPOSED DNA ENCODING METHOD FOR MST

Consider an undirected graph as shown in *Fig.1*. There are seven Vertices (V_i ,i = 1 to 7). In this work, for each vertices a unique vertex strand (vs) with fixed length DNA single strand of length 20 bases having similar melting temperature is synthesized by the sequence generator. For each distance, a unique distance strand (*ds*) with fixed length DNA single strand of length 20 bases with varying melting temperature is also generated. For smaller distance, a DNA sequence with lower melting temperature and for longer distance a DNA sequence with higher temperature is assigned. The DNA sequence for each vertex and for each unique distance is shown in Table 1 and in Table 2. For clarity, the *ds* is represented in lower case. These sequences are generated using the DNA sequence generator software available (MC 2009).

TABLE 1: VERTEX SEQUENCES FOR SEVEN VERTICES

Vertex (V_i)	20-mer sequence (5'-3')	GC%	GC method T_m(^{o}C)	NN method T_m(^{o}C)
V_1	GAAGCCTACT GTACTCTGCT	50	52	52
V_2	GAAGGATACT GGACGCTCTT	50	52	52
V_3	AAAGGGCGTC TTTTAACGGA	50	52	52
V_4	GAAGGATACT GGACGCTGAT	50	52	52
V_5	TATGCGGATT TGGAGGGTGA	50	52	53
V_6	GGTGAACCAA GGTGAACCAA	50	52	52
V_7	GCGTCTCGAC GTAATGTTGA	50	52	52

TABLE 2: FOUR DISTANCE STRANDS

Distance	20-mer sequence (5'-3') (*ds*)	GC%	GC method T_m(^{o}C)	NN method T_m(^{o}C)
2	atgtgaaaatagaaattaag	20	39	40
5	gcatttagtttcagatagat	30	44	44
9	ttactccgcgtaacctatcc	50	52	51
12	agggacaccagcgcggcgaa	70	60	62

TABLE 3: DNA SEQUENCE FOR EDGES

No.	Edge	DNA sequence(5'-3')
1	$V_1 \rightarrow V_2$	GAAGCCTACT GTACTCTGCT gcatttagtttcagatagat GAAGGATACT
2	$V_1 \rightarrow V_7$	GAAGCCTACT GTACTCTGCT ttactccgcgtaacctatcc GCGTCTCGAC
3	$V_2 \rightarrow V_1$	GGACGCTCTT gcatttagtttcagatagat GAAGCCTACT GTACTCTGCT
4	$V_7 \rightarrow V_1$	GTAATGTTGA ttactccgcgtaacctatcc GAAGCCTACT GTACTCTGCT
5	$V_2 \rightarrow V_3$	GGACGCTCTT atgtgaaaatagaaattaag AAAGGGCGTC
6	$V_3 \rightarrow V_2$	TTTTAACGGA atgtgaaaatagaaattaag GAAGGATACT
7	$V_7 \rightarrow V_3$	GTAATGTTGA gcatttagtttcagatagat AAAGGGCGTC
8	$V_3 \rightarrow V_7$	TTTTAACGGA gcatttagtttcagatagat GCGTCTCGAC
9	$V_3 \rightarrow V_4$	TTTTAACGGA agggacaccagcgcggcgaa GAAGGATACT
10	$V_4 \rightarrow V_3$	GGACGCTGAT agggacaccagcgcggcgaa AAAGGGCGTC
11	$V_4 \rightarrow V_5$	GGACGCTGAT gcatttagtttcagatagat TATGCGGATT
12	$V_5 \rightarrow V_4$	TGGAGGGTGA gcatttagtttcagatagat GAAGGATACT
13	$V_6 \rightarrow V_5$	GGTGAACCAA atgtgaaaatagaaattaag TATGCGGATT
14	$V_5 \rightarrow V_6$	TGGAGGGTGA atgtgaaaatagaaattaag GGTGAACCAA
15	$V_7 \rightarrow V_5$	GTAATGTTGA gcatttagtttcagatagat TATGCGGATT
16	$V_5 \rightarrow V_7$	TGGAGGGTGA gcatttagtttcagatagat GCGTCTCGAC
17	$V_7 \rightarrow V_6$	GTAATGTTGA ttactccgcgtaacctatcc GGTGAACCAA
18	$V_6 \rightarrow V_7$	GGTGAACCAA ttactccgcgtaacctatcc GCGTCTCGAC
19	$V_2 \rightarrow V_7$	GGACGCTCTT ttactccgcgtaacctatcc GCGTCTCGAC
20	$V_7 \rightarrow V_2$	GTAATGTTGA ttactccgcgtaacctatcc GAAGGATACT

The edge(road) sequence between the two vertices V_i and V_j has been created to contain three strands. The first strand is a complement strand of rear $|vs|/2$ bases of oligonucleotide of V_i. The second strand is the complement of distance strand. The third strand is a complement strand of front $|vs|/2$ bases of oligonucleotide V_j. If V_i is V_1, then the first strand of edge sequence is a complement strand of 20 bases of oligonucleotide V_1. If V_j is V_1, then the third strand is a complement strand of 20 bases of oligonucleotide V_1. Table 3 shows the edge strands generated for all the 20 edges of the graph shown in *Fig.1*.

PROPOSED BIO-MOLECULAR ALGORITHM FOR SOLVING MST

Applying chemical operations on DNA and with massive parallelism inherent in DNA computing, the MST can be obtained in polynomial time. The molecular algorithm for solving MST requires 7 steps. In the first step, the initial pool of vertex strands and the road strands are synthesized and allowed to hybridize to their complement strands. The concentration of the economical road strands is increased as the rate of biochemical reactions depending on the reaction rate constants and the reactant concentration.

In the second step, all the strands which have the starting and ending vertex strand as V_1 are amplified by PCR operation. During the first PCR cycle, vertex strand corresponding to V_1 is used as primer, whereas the DNA strands complementary to vertex strand V_1 is also used as primer from the second PCR cycle. In step 3, the generated strands are allowed to run in a gel electrophoresis operation. The strands having length

$$\left[(2n-1)*|vs|+(2n-2)*|ds|\right]_{\text{bp}}$$

are separated. Each strands having length $\left[(2n-1)*|vs|+(2n-2)*|ds|\right]$bp represents one possible Euler cycle of a spanning tree having visiting all the vertices, and visiting all the roads connecting these vertices exactly twice and reaching the vertex V_1. In the example given in *Fig.1*, the length of the Euler cycle of a spanning tree strand will be 500bp, given $|vs| = 20$, $|ds| = 20$ and $n = 7$.

In the fourth step, affinity purification is carried out to make sure that the strands have all the vertex strands exactly once. For carrying out affinity separation, the separated strands of length $\left[(2n-1)*|vs|+(2n-2)*|ds|\right]_{\text{bp}}$ are amplified with 5'-biotinylated V_1 as a primer. After amplification, a biotinylated complement DNA sequence of the first robot ($\overline{V_1}$) is used as the filter to attract strands of V_1 and the filtering is done. The remaining strands after filtering are removed. The same operations are carried out with other filter probes having the complement sequence of V_i (i = 2 to n). The resultant strands will be strands involving all robots with length 500bp. Every Euler cycle of a spanning tree visits 2n-1 vertices and 2n-2 edges of a problem with n vertices. Out of these 2n-2 edges, n-1 edges connecting all the vertices must present exactly twice. Even though the number of bases is the same for all the separated strands, there is a possibility for visiting particular edge more than twice. To remove such strands again affinity purification is carried out with each edge sequence. Complement DNA sequence of a particular edge sequence is used to attract the corresponding edge sequence. From the attracted strands it is checked for the presence of reverse direction edge strand also. For example if the edge sequence $V_1 \rightarrow V_2$ is used to attract the strands having this sequence, from the attracted strands it is to be checked for the presence of $V_2 \rightarrow V_1$ edge sequence. The strand which is not attracted by the reverse direction edge strand can be removed. A possible single strand covering all vertices and the presence of n-1 distinct edges each appearing twice is given in *Fig.4*.

GAAGCCTACTGTACTCTGCTgcatttagtttcagatagatGAAGGATACTGGACGCTCTTattgaaaatagaaattaagAAAGGGCGTCTTTTAACGGAgcatttagtttcagatagatGCGTCTCGACGA
ATGTTGAgcatttagtttcagatagatTATGCGGATTTGGAGGGTGAgcatttagtttcagatagatGAAGGATACTGGACGCTGATgcatttagt
ttcagatagatTATGCGGATTTGGAGGGTGAatgtgaaaatagaaattaagGGTGAACCAAGGTGAACCAAatgtgaaaatagaaattaagTATGCGGATTTGGAGGGT
GAgcatttagtttcagatagatGCGTCTCGACGTAATGTTGAgcatttagtttcagatagatAAAGGGCGTCTTTTAACGGAatgtgaaaatagaaattaagGAAGGATACTGGACGC
TCTTgcatttagtttcagatagatGAAGCCTACTGTACTCTGCT

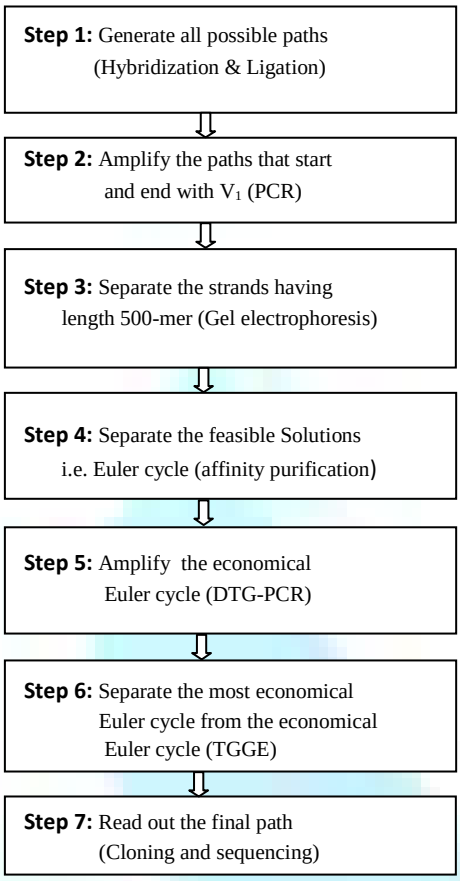
FIG.4 EULER CYCLE SINGLE STRAND INVOLVING ALL VERTICES STRANDS WITH THEIR DISTANCE

In the fifth step, the economical Euler cycle strands having minimum distance has to be separated from the possible Euler cycle strands. The resultant strands of the affinity purification are the strands having same length. They start from V_1 visiting all vertices exactly once and end with V_1. Even though all the feasible strands have the same length, the base composition is different for each strand. For each road strand a low melting temperature is assigned for smaller distance and high melting temperature is assigned for longer distance. Using this variation in the thermodynamic characteristics of each strand, the economical Euler cycle strand gets amplified more by DTG-PCR. The resultant strands from DTG-PCR will have the economical Euler cycle strand occupying the major part in the solution which can be detected easily.

In the sixth step, the most economical Euler cycle paths are separated from the economical paths, by the TGGE. Since all the strands have the same length, they cannot be separated by normal gel electrophoresis operation. Since each strand has different melting temperature, TGGE method is used for separation. TGGE is a gel electrophoresis method which is based on the correlation of the melting characteristic of a DNA strand to its electromigration. TGGE is an extremely sensitive method, which can detect even point mutation. The most economical Euler cycle path is found in one major band and the others are in minor band.

In the last step, the DNA strands from the major band were cloned and sequenced, which has the minimum distance awakening schedule i.e. MST. The algorithm for solving MST is shown as flowchart in *Fig.5*.

FIG.5: FLOWCHART FOR FINDING EULER CYCLE WITH MINIMUM



OUTCOME OF DNA COMPUTATION

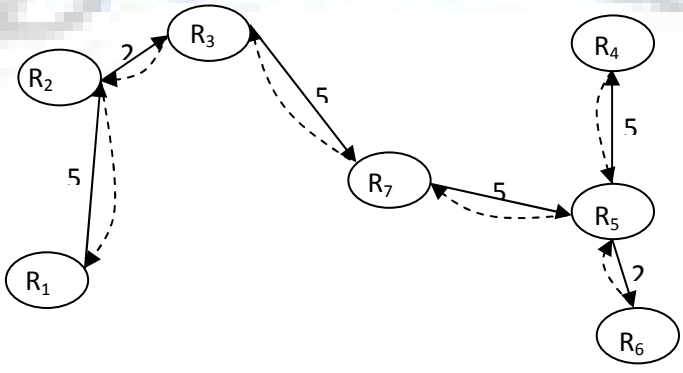
The proposed method gives all possible Euler cycles of the spanning trees of the graph shown in *Fig.1*. During the operation DTG-PCR, the strands representing the economical spanning tree with minimum weight has the minimum temperature. These strands gets amplified more in number than the other strands. These strands occupy the major band in the TGGE operation. The few possible economical Euler cycles of a spanning tree strands involving all the vertices with $2n-2$ edges are shown in Table 4. The temperature for each strand is calculated by the software tool (OPC 2009).

TABLE 4: FEW EULER CYCLE PATHS FOR THE GRAPH SHOWN IN FIG.1

Few Euler cycles of the spanning trees for the graph shown in Fig.1	T_m(°C) GC Method	T_m(°C) NN Method	GC content (%)	Distance
V1→V2→V3→V7→V5→V4→V5→V6→V5→V7→V3→V2→V1 (minimum spanning tree of the graph in *Fig.1*)	79	83	38	48
V1→V7→V1→V2→V3→V4→V5→V6→V5→V4→V3→V2→V1	81	84	43	70
V1→V7→V2→V7→V3→V4→V3→V7→V6→V7→V5→V7→V1	83	85	48	98
V1→V7→V2→V7→V5→V6→V5→V4→V3→V4→V5→V7→V1	82	85	46	84
V1→V2→V3→V4→V5→V7→V6→V7→V5→V4→V3→V2→V1	82	84	44	76

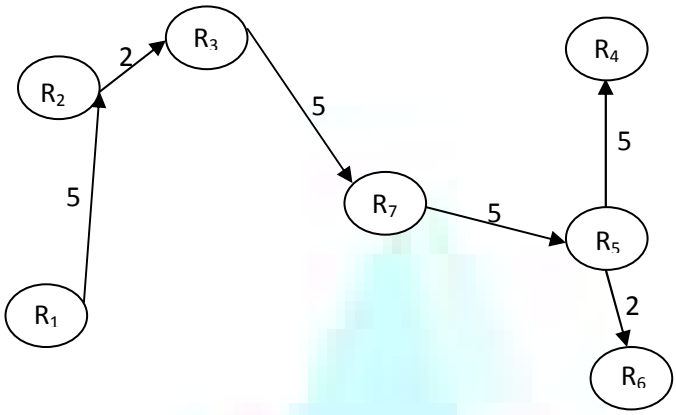
TGGE method is used to identify the most economical Euler cycle of a spanning tree from the economical Euler cycle of a spanning tree. Since all the strands have the same length, conventional gel electrophoresis method is not applicable. So, from the DTG-PCR product TGGE can detect the most economical Euler cycle by forming one major band and other minor bands.The major band can be cloned and sequenced, which corresponds to the most economical Euler cycle $V_1 \rightarrow V_2 \rightarrow V_3 \rightarrow V_7 \rightarrow V_5 \rightarrow V_4 \rightarrow V_5 \rightarrow V_6 \rightarrow V_5 \rightarrow V_7 \rightarrow V_3 \rightarrow V_2 \rightarrow V_1$ for the graph in *Fig.1*. The obtained strand from TGGE is the most economical Euler cycle path having distance 48 as shown in *Fig.6*.

FIG.6: MOST ECONOMICAL EULER CYCLE OF A SPANNING TREE FOR THE GRAPH SHOWN IN FIG.1WITH MINIMUM DISTANCE 48



From the obtained most economical Euler cycle the minimum spanning tree with distance 24 as shown in *Fig.7* can be obtained by removing the duplicate road sequence. This minimum spanning tree for the graph shown in *Fig.1*.

FIG.7: MINIMUM SPANNING TREE FOR THE GRAPH SHOWN IN FIG.1 WITH MINIMUM DISTANCE 24



CONCLUSION

In this paper, a DNA encoding method has been developed and an algorithm for solving the MST has been designed. In this encoding method, the melting temperature of a DNA strand is used to represent numerical values. In this work, for each vertex and each unique distance, a fixed-length DNA strand has been assigned and concentration of the economical edge strand is increased so that it drives the generation of the most economical Euler cycle. Furthermore, DGT-PCR helps to amplify the most economical Euler cycle of the spanning tree that has the minimum temperature and TGGE helps to detect the most economical Euler cycle of the spanning tree from the economical Euler cycles. Furthermore, real values for distance can be employed with the thermodynamic properties of the DNA. The DNA strands have been shown to be successful in solving the MST and this, in future, will help to overcome the limitations of electronic computer, namely storage, speed and miniaturization. A computer with DNA strands shall be benign to the environment. The possibility of representing numerical data in a DNA sequence paves the way for solving many more numerical optimization problems.

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MARKET BASKET ANALYSIS: A DATA MINING TOOL FOR MAXIMIZING SALES & CUSTOMER SUPPORT

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ABSTRACT

Data mining is becoming increasingly common in both the private and public sectors. Industries such as banking, insurance, medicine, and retailing commonly use data mining to reduce costs, enhance research and increase sales. Market Basket Analysis (MBA,-Association Analysis) is a mathematical modeling technique based upon the theory that if you buy a certain group of items, you are likely to buy another group of items. It is used to analyze the customer's purchasing behavior and helps in increasing the sales and maintain inventory by focusing on the point of sale transaction data. Market Basket Analysis is the discovery of relations or correlations among a set of items which are actually transactions made by customer's purchases. MBA also known as affinity analysis has emerged as the next step in the evolution of the retail merchandising and promotion. MBA allows leading retailers to quickly & easily look at the size, contents, & value of their customer's market basket to understand how products are purchased together It helps the retailers to drill down into customer buying patterns over time to precisely target & understand specific, combination of products departments, brands,categories, & even time of day. Association rule which is the output of the MBA helps to specify the combination of the products; those should be sold in combination. The aim of the analysis is to determine the strength of all the association rules among a set of items. The strength of the association is measured by the support and confidence of the rule.

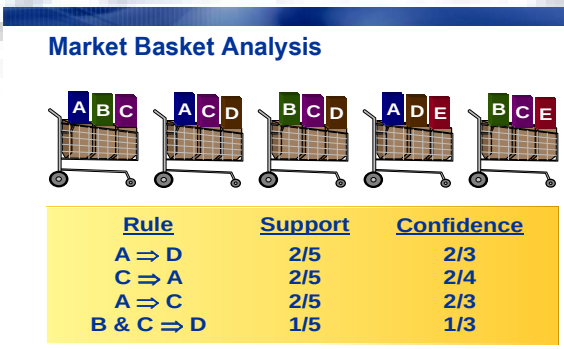
KEYWORDS

Association rule, Data mining, frequent patterns, Market Basket Analysis, threshold criteria.

INTRODUCTION

The major reason that the data mining has attracted a great deal of attention in the information industry in recent years is due to the wide availability of huge amounts of data and imminent need for turning such data into useful information and knowledge. The knowledge gained can be used for applications ranging from business management , production control, and market analysis, to engineering design and science exploration.
The discovery of interesting association relationships among huge amounts of business transaction records can help in many business decision making processes, catalog design, cross marketing and loss-leader analysis.
Data mining functionalities are used to specify the kind of patterns to be found in data mining tasks. In some cases, users may have no idea regarding what kind of patterns in their data may be interesting, and hence may like to search for several different kinds of patterns in parallel.
Frequent patterns, as the name suggests, are patterns that occurs frequently in data. There are many kinds of frequent patterns, including itemsets, subsequences, and substructures. a frequent itemset refers to set of items that frequently appear together in a transactional data set., such as milk and bread. A frequently occurring subsequence, such as the pattern that the customer tends to purchase first PC & then memory card, is a sequential pattern. A substructure can refer to different structural forms, such as graph, trees or lattices, which can be combined with itemsets or subsequences. Mining such frequent patterns leads to discovery of interesting associations and correlations within data.
Frequent itemset mining leads to the discovery of associations and correlations among items in large transactional or relational data sets.
A typical example of association rule mining is market basket analysis. This process analyzes customer buying habits by finding associations between the different items that customers place in their 'shopping basket". The discovery of such association can help retailers develop marketing strategies by gaining insight into which items are frequently purchased together by customers. For instance, if customers are buying milk, how likely are they also buy bread, they will specify what kind of bread they will prefer on the same trip to the supermarket? Such information can lead to increased sales by helping retailers do selective marketing and plan their shelf space. We will answer all these questions with the help of support & confidence- two measures of the association rule.

FIGURE 1: MARKET BASKET ANALYSIS



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METHODOLOGY

A. SCOPE OF RESEARCH WORK

Increasingly retailing is seeking a competitive edge through technology. Market basket analysis also known as affinity analysis has emerged as the next step in the evolution of retail merchandising and promotion.

Market basket analysis allows leading retailers to quickly & easily look at the size, contents and value of their customer's market basket to understand the patterns like how products are purchased together Advanced implementations of market basket analysis leverage the instant results to encourage train of thoughts enabling retailers to drill down into customer buying patterns over time ,combinations of products, departments, brands, categories,& even time of the day.

1) It checks some items usually bought in.
2) It helps to organize product in to different groups.
3) It gives information about products which almost always or almost never purchased together.
4) It gives information about how many items are there in a typical transaction. Once you get association rules, you can use this knowledge for many business ideas. Here are some of the business ideas:

a) Cross selling: Offers the associated item when customer buys any items from your store.

b) Product Placement: Items that are associated (such as bread and butter, computer & antivirus software) can be put near to each other. If the customers see them, it has higher probability that they will purchase them together.

c) Affinity Promotion: Design the promotional events based on associated products.

d) Customer behavior: Associating purchases with demographic, and socio economic data (such as age, gender & preference) may produce.

B. AIMS & OBJECTIVES

1) To study & analyze present customer purchasing & Organizations (retailers) role.
2) To study & suggest a suitable data mining tool which helps the organization
3) To make suggestions wherever necessary.
4) Empower the retailer planner.
5) Empower the merchant (buyer) to buy smarter
6) More profitable advertising & promotions.
7) Better loyalty card promotions with longitudinal analysis.
8) Attract more traffic into the store.
9) Increase the size & value of the market basket

C. METHODOLOGY

The following methodology adopted while developing the system.

1. The existing purchase and sale of the product is studied.
2. The purpose of different customer buying behavior is studied.
3. The information was collected from the related database and through discussion with manager.
4. After completely studying all aspect regarding customer, searched for statistical analytical process that will be suitable for the organization.

First I will use survey & interview technique to collect transactional data of the sales of products which are made by the customers. Then I will use Market Basket Analysis or Association Rule Mining which is one of the data mining tools. Market Basket Analysis may be performed on the retail data of customer transactions at the store. The results may be used to plan marketing or advertising strategies as well as catalog design.& to learn about the buying habits of your customers.

Steps for market based Analysis are as follows:

1. Generate all possible association rules.
2. Compute the support and confidence of all possible association rules.

Lets us call the items currently seen by the customer as X (independent variable) and other items associated to those current items as Y (dependent variable).

If you have 3 items, name A ,B and C, we have 12 possible association rules as shown below:

Generating all possible association rules if you have three items named A, B, C, we have 12 association rules.

TABLE 1: POSSIBLE ASSOCIATION RULE

Association no	X	Y
1	[A]	[B]
2	[A]	[C]
3	[A]	[B,C]
4	[B]	[A]
5	[B]	[C]
6	[B]	[A,C]
7	[C]	[A]
8	[C]	[B]
9	[C]	[A,B]
10	[A,B]	[C]
11	[A,C]	[B]
12	[B,C]	[A]

For our demonstration example, we have 4 items that generate following possible association rules as shown below.

TABLE 2: TRANSACTIONAL DATA FOR MBA

Transaction ID	Items from the customers who bought more than 1 item
1	Sugar, Wheat, Pulses, Rice
2	Sugar, Pulses
3	Wheat, Pulses
4	Wheat, Pulses, Rice
5	Wheat, Pulses
6	Sugar, Wheat
7	Sugar, Rice, Pulses

For simplicity we call the items by its letter (A for Sugar, B for Wheat, C for Pulses, D for Rice). Lets us give name to compute support & confidence, we first set our transaction data into binary data as below:

TABLE 3: INPUT TRANSACTION RECORDS BINARIZED TRANSACTIONS

TID	Items from customers who bought more than 1 items		TID	A	B	C	D
1	Sugar, Wheat, Rice, Pulses		1	1	1	1	1
2	Sugar, Pulses		2	1	0	0	1
3	Wheat, Rice	⇒	3	0	1	0	1
4	Wheat, Rice, Pulses		4	0	1	1	1
5	Wheat, Pulses		5	0	1	0	1
6	Sugar, Wheat		6	1	1	0	0
7	Sugar, Rice, Pulses		7	1	0	1	1
			sum	4	5	3	6

TABLE 4: SUPPORT & CONFIDENCE

Transaction ID.	X	Y	N(X U Y)	N	%support	N(x)	Confidence	Accept as rule ?
1	A	B	2	7	29%	4	50%	NO
2	A	C	2	7	29%	4	50%	NO
3	A	D	3	7	43%	4	75%	Yes
4	B	D	4	7	57%	5	80%	Yes
5	C	A D	2	7	29%	3	67%	Yes

The support for the rule $A \Rightarrow B$ is the probability that the two item sets occur together. The support of the rule $A \Rightarrow B$ is estimated by the following:

$$\text{Support } (X \ Y) = \frac{\textit{transactions that contain every item in } A \textit{ and } B}{\textit{all transactions}}$$

The confidence of an association rule $A \Rightarrow B$ is the conditional probability of a transaction containing item set B given that it contains item set A. The confidence is estimated by the following:

$$\text{Confidence}(X \ Y) = \frac{\textit{transactions that contain every item in } A \textit{ and } B}{\textit{transactions that contain the items in } A}$$

For this above table i.e. Table 4 we can give threshold value to support & confidence for getting the association rule. As below:
Minimum support = 40 %
Minimum confidence = 60 %

CONCLUSION

1. There are certain buying habits of the customer.
2. There is association between the products which are purchased by the customer.
3. The procedure of purchasing the product by the customer depends on mainly on customer's requirement, product availability, and suitability. Product should be arranged suitably & attractively in the rack; so that they will be accessed easily .This probability of purchase of the product by the customer is checked & formulated.
4. It is observed that the product which are in the association rule ,the probability of buying these products by the customer is very high.

SUGGESTIONS

On the basis of the results from the data mining tool the following suggestions are given:

1. It is suggested that organization should keep track of all transactions made by the customer.
2. The organization should install the data mining tool for the stored databases, which helps generating various association rule concerned with the products.
3. It helps organization in dating prior knowledge of associated items which customer is willing to buy from the store

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FAULT DETECTION IN NETWORKS BASED ON DYNAMIC INTERVAL BASED ACTIVE PROBING

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ABSTRACT

Increase in the network usage for more and more performance critical applications has caused a demand for systems that can monitor network health with minimum management overhead. Active probing is widely used to provide effective tools for end-to-end monitoring and fault diagnosis over a network. Adaptive probing based algorithms use probing messages to diagnose the state of the nodes in the network. The fault nodes are identified and reported. But the tricky part of probing is to localize faults in the network by sending less probes so that the network load does not get severely increased. In this paper we present a dynamic probing interval selection that keeps the amount of probing under control. Using the reliability and failure rate metric of the nodes as the based, we calculate the probing frequency that will be varying and according to the network's vulnerability to node failures. Our assessment of the proposed method gives satisfactory result and we are realized that this approach provides better performance than approaches, which probe for fixed frequencies.

KEYWORDS
fault management, fault detection, probing, networks.

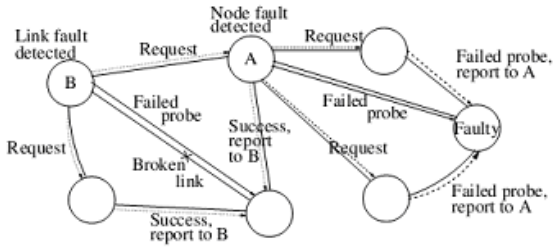
INTRODUCTION

Fault detection is the process of detecting a node failure and localizing the cause of the failure from observed failure indications. With the widespread usage of computer networks in performance critical applications, fault diagnosis has become a vital task for network administrators. Furthermore, increasing advances in developing performance critical applications, increasing importance on quality of service, and growth of large and complex systems make quick detection and isolation of faults essential for robustness, reliability, and system accessibility.

Broadly there are two approaches to fault detection, active and passive detection. Active detection is an active, effective, and adaptive network detection technique, which can detect and localize the faults in the network as soon as possible by sending out probing packets, which include some measurement parameters, into the network. In contrast, passive detection only analyzes the messages already present to infer the existence of network faults without sending out additional probing packets. In this study, we mainly discuss active detection.

Probing is based on actively sending out probes in the network to infer the health of network components. Probes are test messages whose response depends on the health of the probed network components. Probing is typically used to obtain end-to-end statistics such as latency, throughput, loss, and route availability. For instance, a probe could be a ping to collect information about connectivity of nodes. Probe tests are performed in each node to test the availability of adjacent nodes and links. If a probe test on a connection fails, a symptom of a network fault has been detected and a fault-localization process based on node collaboration is initiated (see Figure 1).

FIG 1: EXAMPLE OF ALGORITHM FUNCTIONALITY



There are two main problems to address while developing probing-based monitoring solutions namely probe station selection and probe selection. The probe station selection problem addresses the problem of selecting nodes in the network where the probe stations should be placed. The probe stations are the nodes that send probes into the network and analyze probe results. The probe station nodes should be selected such that the required diagnosis capability can be achieved through probes. Furthermore, as the probe station selection involves an additional instrumentation cost, the number of probe stations need to be minimized. Once the probe stations are identified, the probe selection problem addresses the task of selecting appropriate probes such that the failure can be detected and localized. As the probes involve an additional traffic overhead, the number of probes should be minimized. At the same time, the probes should be selected such that the detection and localization time is minimal. In this paper we address the problem of selecting the ideal probing interval in order to keep the additional load due to probing under control and at the same time ensuring proper failure detection.

REVIEW OF LITERATURE

In this section, we review the related works in the area of fault detection and recovery in computer networks. Many techniques have been proposed for fault detection, fault tolerance and repair in computer networks. In a paper by Yu et al., one of the main risks of centralized approaches identified is increased link load, close to the central collection point [2]. Further, the authors point out that neighbor-coordination for fault-detection reduces communication overhead. Different strategies for fault-detection have been investigated by Zhuang et al. [3]. The authors divide fault-detection into passive and active methods. Passive approaches eavesdrop on packets for monitoring the status of other nodes, whereas active monitoring methods are based on end-to-end transactions between nodes. One such probing method is based on logical trees for determining a candidate node for probing [4];

In another approach, the authors solve the NP-hard problem of computing a minimal set of probe messages to be transmitted by the stations for fault-isolation and latency measurements, applying a polynomial-time greedy approximation algorithm [5]. Other techniques for active probing are based on statistics and information-theoretic approaches; for example probabilistic reasoning is performed to select the most informative probe test [6]. Tang et al. propose a combination of passive and active methods for isolating faults via probing, involving heuristic fault-reasoning and fidelity measures for decision making [7]. Andersen et al. describes a method [8], in which two different probing frequencies are applied and used for outage detection. Their probing approach is based on fixed time intervals applied to all connections in the network. In contrast, probing intervals in our approach relates to the reliability of the nodes in the network and are not based on any fixed time.

DYNAMIC PROBING INTERVAL SELECTION

Usually a network won't have any faulty nodes in the initial several rounds of usage. Thus, the probe stations that send probing packets during each probing session, but will not receive any useful feedback messages until the first fault node has appeared. In other words, all the probing work is useless during the period from the beginning to the time when the first fault nodes appear. A way to considerably reduce this useless probing is to not send out the first probing packet until there is a failure in the network, this depends on the reliability of the nodes in the network.
The following notations are used in our discussion.

NOTATIONS

Si	–	Sensor node
S	–	set of sensor nodes
Ri(t)	–	reliability of si in time t
Fi(t)	–	fault probability of Si in time t
Ti	–	average life time
α	–	fault rate of sensor
w	–	time interval of sensing probing packets
fre	–	probing frequency

In general, a node's failure probability will change with time, and the longer the time a node works the higher failure probability it will have. We can define the reliability R_i (t) of a node S_i as the probability of not having a failure within the time interval (0,t).

$$Ri(t) = e^{-at}$$

where α is the failure rate of node Si. The fault probability of node Si in time t is Fi (t):

$$F_i(t) = 1 - R_i(t)$$

It is easy to see that the probability Ri(t) means the probability of lifetime is larger than t_0. Then, the average lifetime of the nodes is Ti:

$$T_i = \int_0^\infty R_i(t)dt = \int_0^\infty e^{-at}dt = \frac{1}{\alpha}$$

The reliability of the entire network is R:

$$R_i = \prod_1^{|s|} R_i(t)$$

Since the nodes of the networks have the same α, the average lifetime (T) of the entire network must be:

$$R = \prod_1^{|s|} R_i(t)dt = \int_0^\infty e^{-|s|at}dt = \frac{1}{|s|\alpha}$$

where | S | is the number of nodes in the network. We can trust that there is no faulty node before T in the network. Thus we can reduce the probing packets until T , and cut down the number of useless probing packets.
In this study, we decrease the probing interval through dynamic adjustment of the probing frequency to reduce useless probing. A simple rule is described to show how to determine probing frequency:

$$fre = \begin{cases} 1 & |Sd| \geq 1 \\ 1/w & other \end{cases}$$

In this way, we can reduce the useless probe traffic using the above rule, but the problem of missing faults must be considered when reducing the probing frequency. Because the probing packets are sent out every round, any faults occurring during the interval between these probing packets and the next probing packets may be missed. For convenience we call this interval the probing interval. In this study, we adopt two measures to avoid this disadvantage:

- In any cases, the probe station nodes broadcast the probing packets to their one-hop neighbors. If the probe station node doesn't receive feedback messages from one neighbor, this one could be the fault node, so even when the fault nodes occur in the time with no probing packets, they can still be detected out by the later probing packets. This however will result in some delay.
- Any node of the network can store the messages of all fault nodes, and once a new fault node was detected out, the probe station broadcast the messages of this fault node to the neighbors. This way we could avoid broadcasting the repeat fault messages.

RESULTS & DISCUSSION

Our proposed approach will keep the frequency of probing or the probing interval to be minimal when there are no faults reported, and would increase the frequency as faults begin to occur. An important factor we should consider when studying fault detection problems is the FDR (Fault Detection Rate). FDR is the proportions of faults have been detected by probe stations. We can get the FDR by dividing the number of nodes that have been detected by the total number of fault nodes. According to our assessment, the FDR rate for our approach would be relatively lower. Because, If the probe station nodes happen to fail in the round they should send out probing packets, the faults will be detected at least two rounds later. This will lead to two more rounds of delay, and the faults would be missed. In extreme cases, the earlier several faults would be missed because of the successively failed probe stations. The probing frequency is not adjusted to the normal value until one fault is detected. As a result, the FDR of this approach will be low in certain cases, but it ill be acceptable in most general cases.

CONCLUSION AND FUTURE WORK

In this paper we analyze the problem of active probing based fault detection of nodes in a network. We find that the frequency of probing has a profound impact on the overall network traffic. As the network traffic increases, this results in congestion, packet loss and eventually drops in QOS. It also results in wastage of bandwidth. So it is important to avoid unnecessary probing. We have proposed a strategy that will decrease the probing frequency through dynamic adjustment of the probing frequency to reduce useless probing. As part of the future work, we aim to work on addressing Quality of Service (QoS) failures.

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ISSUES AND CHALLENGES IN ELECTRONIC WASTE

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ABSTRACT

In our daily life we are frequently using electronic items like computer, mobile phone, PDAs, television, pager, digital photo frame etc. But due to tremendous competition in the market and technological advancement, various venders are developing newer and newer products with more functionality. Hence people are now a day frequently change or purchase a new electronic product, which indirectly makes earlier purchased product useless or less useful. Such useless or older products later on become Electronic Waste. So far electronic waste has not created big problem in developed and developing countries, but as penetration of electronic items to the general people increasing rapidly, in coming decade electronic waste may become a big problem for developing countries. In this paper we had highlighted important issues which are related to the electronic waste generations, waste management and suggestions are made such that electronic waste can be minimized.

KEYWORDS

Electronic Waste, E-Waste, E-scrap, E-Waste Management Standards.

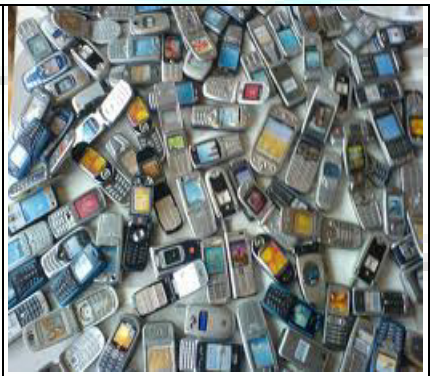
INTRODUCTION TO ELECTRONIC WASTE

Now a day we frequently use different types of electronics devices in our daily life. Electronics industry is the fastest growing manufacturing industry in the world. Due to rapid research advancement and development in different field of engineering and technology, frequently new electronics products are launched in the market every day. Such newly developed products are cheaper and better in terms of performance compare to older devices, which is one of the main reasons why people buy a new product. Such cases are frequently happening in the category of the products like Computers systems including monitors, Televisions, Radio, Cell phones, DVDs, VCRs, audio equipment, video games and other personal digital assistant (PDA). Rapid electronic product obsolescence makes such products "disposable" very quickly. This reduces the average life span of the electronic product. Later on such discarded electronic products become the "Electronic Waste (E-Waste)". According to very famous web site Wikipedia, the term electronic waste can be defined as discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets and refrigerators. This definition includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal (Wikipedia, 2011).

It is very important to address and tackle e-waste issue at this moment, because according to one of the survey conducted by the Environmental Protection Agency only 15-20% of e-waste is recycled, the rest of these electronics go directly into landfills(EPA, 2011), which is very bad from environmental safety point of view. Electronic wastes can cause widespread environmental damage due to the use of toxic materials in the manufacturing process of electronic goods (Kurian Joseph, 2007). The major part of the electronic waste is generated from the old televisions, cathode ray tube based monitors, refrigerators and cell phones. Figure 1 shows some of the sites where electronic waste dumped in open land.

FIGURE 1: MAJOR CATEGORIES OF ELECTRONIC WASTE


Old television & Monitors (Wordpress,2011)


Cell phone waste (Highdesert, 2011)


Monitor waste(Shoroc, 2011)

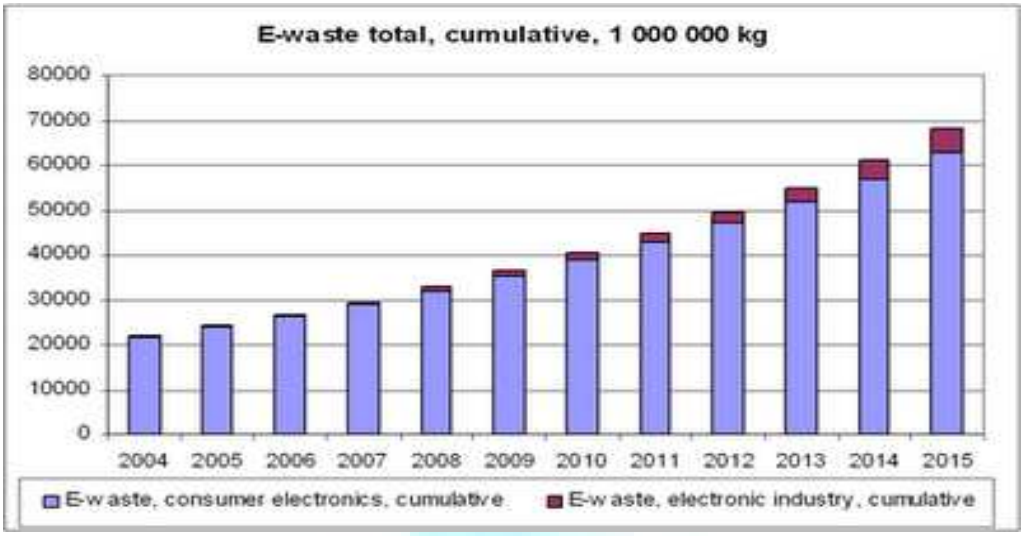
If we talk about the current practices of electronic waste management in developing countries, it suffer from a number of drawbacks like the difficulty in unhealthy conditions of informal recycling, inadequate legislation, poor awareness and reluctance on part of the corporate to address the critical issues related to e-waste management.

MAJOR ISSUES RELATED TO ELECTRONIC WASTE

RAPID GROWTH OF E-WASTE GENERATION

It has been observed that average life of electronics products are ranging from 5 years to 20 years. Since the usage of electronic items increased rapidly from last 10 to 20 years, the users of such product will be generating more and more e-waste in coming years. One of the surveys conducted (e-wasteregulation, 2011) will be given in Figure 2 shows the rapid growth of e-waste. The survey shows the continuous growth in the e-waste.

FIGURE 2: E-WASTE GROWTH SURVEY



The latest report released by the United Nations predicts that by 2020 e-waste from old computers in South Africa and China will have jumped by 200–400 % and by 500 % in India compared to 2007 levels. It also states that by 2020 e-waste from discarded mobile phones will be about 7 times higher than 2007 in China and 18 times higher in India (Chemistry views, 2011). According to that study by EPA, in 2007, of the 2.25 million tons of televisions, cell phones and computer products ready for end-of-life (EOL) management (EPA, 2011) 18% (414,000 tons) were collected for recycling and 82% (1.84 million tons) were disposed of, primarily in landfills.

By the year 2020, e-waste from televisions will be 1.5 to 2 times higher in China and India while in India e-waste from discarded refrigerators will double or triple. China already produces about 2.3 million tonnes (2010 estimate) of e-waste domestically (Unep, 2011). So it is important to control this rapid growth of e-waste generation before it creates big problem.

RECYCLING OF ELECTRONIC PRODUCTS

Products like old computers are recycled to recover costly materials from it. For example, in a computer waste hard disks are broken to recover the aluminum casting, then after the remaining material are dumped in the open landfills. There are two types of electronic waste, hazardous and non-hazardous. It is easier to recycle the non-hazardous material compare to the hazardous material. It is observed that limited data is available regarding how e-waste is managed. It is also observed that e-wastes are handled improperly by the recycler of e-waste. Followings are the major observed recycling e-waste procedures (Linda Luther, 2010)

- burning the plastic coverings of materials to take out metals from scrap,
- openly burning circuit boards to remove solder
- soaking e-waste in acid baths to extract metals from e-waste like gold or other precious metals.

Acid baths waste are then dumped into surface water which is very bad for creature dependant on such surface water. It should be important to note here that an individual electronic device may not have hazardously high levels of a toxic material, but the cumulative force of large volumes of e-waste being disposed of in a solid waste landfill has become disturbing to many governments and e-waste management organizations.

As only 15-20 % of e-waste are recycled now a days, remaining amount of material becomes e-waste which creates problem for environment. So the recycling of the e-waste at this point of time is not the complete solution of this problem. We need to develop more advanced technique of recycling of e-waste so that percentage of re-usage can be increased.

HURDLES IN RECYCLING OF E-WASTE

Electronic product contains different types of hazardous materials which are harmful to human health and the atmosphere if not disposed of cautiously. The important hazardous substances present in the e-waste are Arsenic, Barium, Beryllium, Cadmium, Chromium VI, Lead, Lithium, Mercury, Nickel and Zinc Sulphide (TFP Group, 2011). These are the various heavy metals and they are toxic in nature. They are found in various electronic equipments like light emitting diodes, cathode ray tubes(CRT), Rechargeable batteries, power supply boxes, printer inks and toners, photocopying-machines (printer drums), fluorescent layer in CRT screens, printed wiring boards, fluorescent lamps that provide backlighting in LCDs, alkaline batteries and mercury wetted switches.

Earlier stated substances are toxic in nature and may lead to different kinds of diseases in human body. Due to exposure of such substances human body may suffer from various diseases of the skin, brain swelling and muscle weakness. Cadmium components may have serious impacts on the kidneys. Also short-term exposure to high levels of lead may cause vomiting, diarrhea, coma or even in worst case up to the death of human. This may be one of the reasons why people or industries are hesitating in recycling electronic waste.

The cost factor related to recycle of e-waste of also very important. According to one survey by Congressional Research Service (Linda Luther, 2010) it is found that e-waste recycling procedures involves complex processes and it is more costly to recycle e-waste. It is very easy to recycle a single component product like news papers or plastic bottles. But an electronic device in the e-waste contains a lot of mixed materials/metals that may not be easily separated or extracted.

ROLE OF ELECTRONIC GOODS DEVELOPER AND USER

The developer and manufacturer of electronic goods should develop a product in such a manner that maximum amount of material from the electronic products can be re-used when it is discarded by the user. To get the maximum profit and to maintain their product cost low, there is tremendous competition between the manufacturing companies of electronics product. Also sometimes companies are spending less in their research and development work, which indirectly responsible for the lower percentage of recycling of e-waste.

Recycling of e-waste facility is not available at all places; hence many users of electronics products are not able to submit their products for recycling purpose. Also some of the users are not interested in submitting the e-waste for recycling purpose which is also responsible for lower percentage of recycling.

E-WASTE MANAGEMENT POLICY IMPLEMENTATION

Presently e-waste management policies are there but no clear guidelines available to the general public regarding such e-waste management policies. Manufacturers of various electronics goods must be responsible for educating customers and the general public regarding the potential hazard to public health and the environment posed by their products (Kurian Joseph, 2007).

Due to humble efforts from the various NGOs and government, some general awareness have started and people are now submitting their old electronic products for recycling purpose instead of just dumping it in to the open space. Also many internationally well known companies like SONY, SAMSUNG, Hewlett-Packard (HP) and Dell have already started to consider e-waste management aspects along with their electronic products.

SUGGESTIONS TO REDUCE ELECTRONIC WASTE

E-WASTE MANAGEMENT STANDARDS

There are e-waste management standards available as a standard guideline while handling the e-waste. Environmentally sound e-waste management standard means taking all possible steps required to make sure that e-waste are managed in a way which shall protect the environment and health against any unpleasant effect. But this is not happening presently as e-waste standards are in very early stage of implementation in India. In United States, many states have instituted mandatory electronics recovery programs. The details about US recycling rules are available on www.ecyclingresource.org website.

Up to April 2011, in India there are no specific laws or guidelines for electronic waste or computer waste management. They will come into effect from May 2012. The Ministry of Environment and Forest (MoEF), Government of India has for the first time notified e-waste management rules(Business Standard, 2011). The e-waste (management and handling) Rules, 2011 would recognize the producers' liability for recycling and reducing e-waste in the country. The rules will come into effect from May 1, 2012. This rule will be application to the every producer, consumer or bulk consumer involved in the manufacturing of electronic product, sale, purchase and processing of electrical and electronic equipments. Effective implementation of such kind of e-waste management standards will help in reducing e-waste.

As per the guideline given in E-waste (management and handling) Rules, 2011, Government of India, every producer, collection center of e-waste and recycler of e-waste may store e-waste for the period of 180 days only. Because of this restriction of 180 days, involved stack holder of e-waste management have to process/recycle the e-waste in the given period only, which indirectly reduce the e-waste in specified period of time.

FORCEFUL IMPLEMENTATION OF E-WASTE MANAGEMENT POLICY

Government can force manufacturer of the electronic goods to reuse some percentage of their own e-waste products after recycling it. These will reduce some e-waste and also indirectly encourage the manufactures to do more research in the direction of recycling of their own products.

Manufacturer may be forced to use some percentage of biodegradable materials in their products/components development. Government may also force them to use newer technology particularly for manufacturing and de manufacturing. Also they can be forced for the green packaging options. The producer/manufacturer may be given the responsibility of collection of e-waste generated during the manufacturing processes. The producer shall be responsibility for the collection of e-waste generated from the end of life of product and setting up the collection center for collecting the wasted products.

Manufacturers of electronic and electrical equipments shall be forced to reduce the use of Lead, Mercury, Cadmium, Haxavelant chromium and other hazardous material in their products. In avoidance is not possible then they should be forced to mention such information along with the product itself mentioning the hazard which may occur. This forceful implementation will become possible and easier for the government once the e-waste (management and handling) Rules, 2011 come into effect.

TRAINING OF E-WASTE MANAGEMENT POLICY ASPECTS

All personnel involved in handling e-waste collection, distribution to recycler and management of e-waste recycling should be properly trained for implementing all the aspects of e-waste management policy. Such kind of training should be given to all the levels of persons in industries including employees working at operational, managerial and at strategic level.

REWARDS FOR RECYCLING E-WASTE

Companies can adopt their own e-waste management policies while handling e-wastes. Government should give some rewards in the form of financial benefits to the companies working for e-waste management. This can be done by giving various kinds of subsidies to the organization or companies involved in the e-waste management and recycling. This kind of rewards will motivate more and more companies to work in the direction of minimizing e-waste.

E-WASTE AWARENESS IN GENERAL PUBLIC

People should be encouraged to upgrade or repair their electronic goods rather than purchasing newer one every time. Awareness should be reached to the general public that donating electronics for reuse/recycle extends the lives of expensive goods and keeps them out of the e-waste management for a longer time. People can be encouraged to donate their old electronics items to the schools, non-profit organizations, and lower-income families. This can also helps to reduce e-waste.

People should be informed about the fact that e-wastes should never be disposed with garbage and other home wastes. Also while buying electronic products people should take care regarding toxic constituents of the products (should be low), reusability / recyclability of the product (should be high), energy efficiency, possibility of the upgradation (should be high) of the product and it have been certified by the respective regulatory authorities.

CONCLUSION

It is researchers and manufacturers responsibility to develop electronics products in such a manner that e-waste can be minimized. Also through proper training amongst the people involved in the e-waste recycling management and actual end user of the electronic products can save the environment from the greater damage. Strict implementation of e-waste management related standards can help greatly to reduce e-waste problem. Reusable and recyclable electronic products along with more and more plantation of the trees can help in recovering earth from the damaged occurred from the e-waste. This paper is one step from our side to generate some awareness in the area of e-waste and its management.

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STUDY ON CSR OF WIPRO, TATA & RIL

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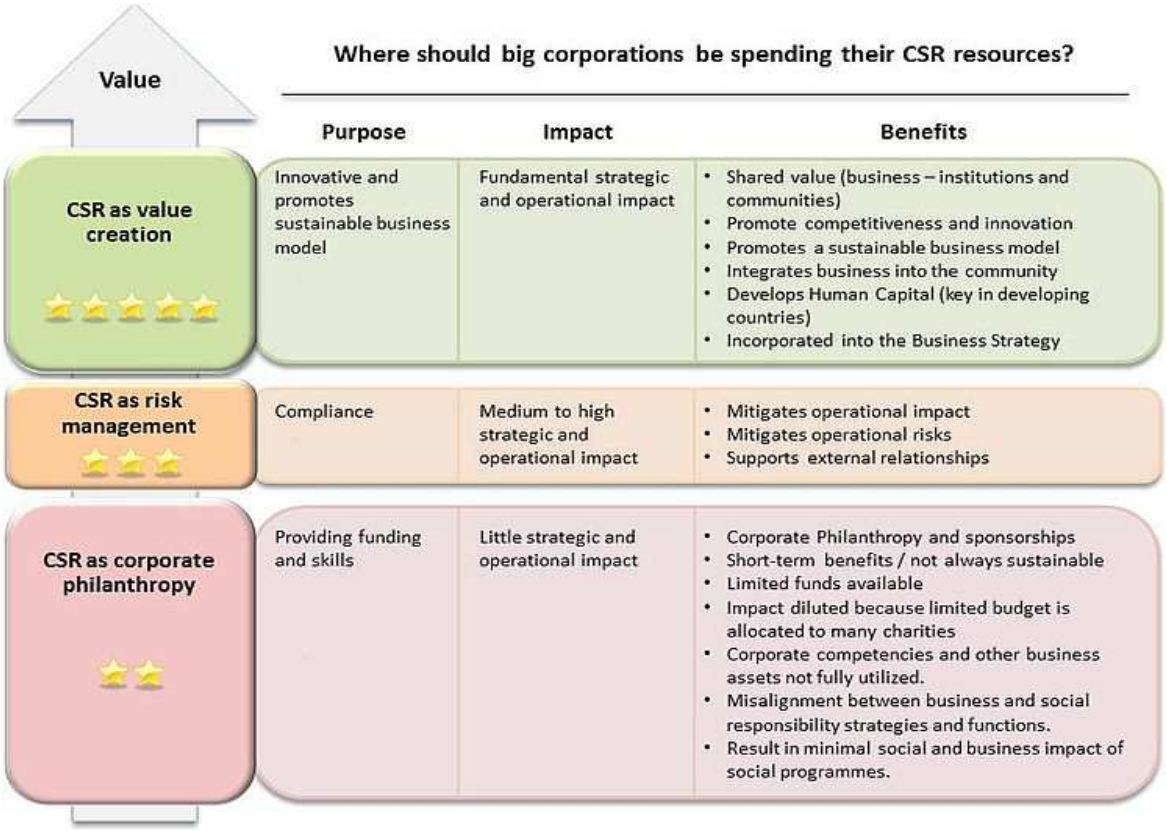
ABSTRACT

This article highlights the CSR activities adopted by big companies. Today big companies are 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. Engaging in corporate social Responsibility activity is considered by many as a necessity for any company. As part of CSR activities, the giant companies start to focus on Environmental Protection, Labour Security, Human Rights, community involvement, Business standard, Market place, Education & leadership Development, Human Disaster relief, Health Promotion, Anti-corruption . This obligation is seen to extend beyond the statutory obligation to comply with legislation and sees.

KEYWORDS
Corporate Social Responsibility, healthcare initiatives, Rural Development, Education development.

INTRODUCTION

CSR is about managing the overall impact of a company on society. This includes the direct impact of operations and the wider impact of the business up and down the value chain, from suppliers to customers and consumers. It also covers the voluntary contributions the Company makes to the community and wider society. CSR is generally seen as the business contribution to sustainable development which has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", and is generally understood as focusing on how to achieve the integration of economic, environmental, and social imperatives. CSR also overlaps and often is synonymous with many features of other related concepts such as corporate sustainability, corporate accountability, corporate responsibility, corporate citizenship, corporate stewardship, etc. The purpose, impact and benefits of CSR are explained in the following diagram[6].



Social responsibility is an ongoing journey with evolving expectations and challenges for Business. The main objective of the paper is to study the different CSR activities adopted by the big companies like WIPRO, TATA group and Reliance Industries ltd.

OBJECTIVES OF THE STUDY

1. To understand the activities under the heading of CSR.
2. To understand and learn about the CSR activities adopted by WIPRO, TATAs and RIL respectively.

METHODOLOGY

The information for CSR activities conducted by 3 companies is collected from their websites and annual reports. So, this study is based on secondary data only. These 3 companies are part of fortune 500 and they are the highest value creators for their shareholders[2].

FINDINGS AND DISCUSSION

CSR AT WIPRO

Wipro focus on education & healthcare for marginalized communities, and environment & disaster rehabilitation.

Education: Wipro work with partners to create an engaging atmosphere where children can spend a few hours a day at informal learning centers. Some of the initiatives aim to provide additional support to bright students from poor families by providing books or opening up their world through interactions and motivation.

Healthcare: Wipro mobile clinics reach the communities around factories and provide healthcare to those who cannot come to the centre. It provides primary health care services and focus on both preventive and curative treatment.

Environment: Wipro Cares undertakes activities in the community under its Eco-Eye charter. They adopted and developed Lake Manikonda in Hyderabad. In 2010 Wipro worked to increase its water holding capacity, built a bio-fence and installed a water purifier system to ensure that the incoming water is clean.

Disaster Rehabilitation: In areas affected by disasters, Wipro Cares works on rehabilitation, to provide long term support to the community, to restart their lives. In 2009-10, Wipro Cares ran a pilot project in parts of Bihar affected by the Kosi river breach. They also provided ecologically sustainable infrastructure such as eco-sanitation, solar lights and rain water harvesting in the community of Mandal Thola in Puraini village. Wipro also contribute by providing solar street lights, cobbled streets, raised platforms as shelters for animals, raised hand-sets and cleaned open wells among other activities.

CSR AT TATA GROUP

According to a Nielsen survey- Tata Group is the country's most admired companies for their corporate social responsibility initiatives in the field of education, environment conservation and public health.

TATA always emphasizes on promoting and encouraging economic, social and educational development within their communities. The company is pledged to causes such as strengthening civic amenities in and around its sites, providing healthcare, education, training, employment and recreation, and preserving culture and heritage, especially of indigenous tribes.

In India, Tata Steel has expanded its reach from the city of Jamshedpur and its adjoining urban areas to over 800 villages in the Indian States of Jharkhand, Odisha and Chhattisgarh, touching the lives of hundreds of thousands of people. The Tata Steel Group's focus in the area of corporate sustainability includes social sustainability, environmental sustainability, social welfare, sport and inclusive growth in an attempt to ensure that the Group's successes are shared by all its constituents and stakeholders.

CSR AT ABROAD:- In Europe, initiatives like apprenticeships and graduate schemes, sponsorship of British Triathlon and several other programs have ensured that extended communities are benefited by the Group's businesses. Tata Steel also encourages suppliers to share its high level of commitment to the environment.

Environment:- TCS community initiatives have been in areas addressing environmental and civic problems; setting up and maintaining infrastructure for urban beautification, pollution reduction and healthcare; waste management in the office environment; water treatment; and building a world-class super-specialty hospital for children in Mumbai city.

Education:- TATA INSTITUTE OF SOCIAL SCIENCES Established in 1936 as the Sir Dorabji Tata Graduate School of Social Work, the Tata Institute of Social Sciences (TISS) was recognized as a Deemed University by the University Grants Commission in 1964. The Institute's main campus is in Chembur, in Mumbai. It also has a campus located at Tuljapur, Osmanabad District, Maharashtra, and is currently engaged in setting up campuses in Hyderabad and Guwahati, responding to invitations from the respective state governments.

CSR AT RELIANCE INDUSTRIES LTD

Education:- A network of nine schools caters to 13,251 students spread across geographies in India. To promote girl education, in Gujarat, under the project "Kanya Kelvani", RIL's Dahej Manufacturing Division has extended financial assistance towards education of girl child in the state. RIL provide computer litereacy to the primary and secondary students. RIL adopted village Mangrowal- Nari primary school, which provides annually free uniforms, books, shoes and school bags are given to students and also free electricity is provided to the school. Eleven schools were selected for this initiative, out of which seven Zilla Parishad schools are located on a hilltop near the manufacturing division. RIL's Project Jagruti, the project to tackle dyslexia in Surat, is setting the pace for the community's response to the social dogma of the mentally underprivileged children. More than 8,800 hours have been spent by 35 trained teachers and more than 1,000 hours by RIL volunteers. NIOS registration has been initiated for Academic Year ("AY") 2011-12. RIL has also partnership with similar associations across the country and UNESCO / BBC has been initiated to spread awareness and benefit the students with latest training aids.

Reliance Dhirubhai Ambani Protsaham Scheme(RDAPS):-The Scheme, launched in AY 2008-09, continues to support poor meritorious students, who got admissions in junior colleges of their choice.

Mumbai Indians Education for All Initiative:- It launched its Education for All Initiative during the Indian Premier League (IPL) season in 2010 to create a movement to support efforts to provide quality education to all children. This initiative was the brainchild of Mrs. Nita Ambani, a passionate advocate for the cause of education. Through this effort, Mumbai Indians supported five NGOs carting out outstanding work in the field of education - Akanksha, Nanhi Kali, Pratham, Teach for India and Ummeed. Mumbai Indians also invited 700 children from all the NGOs to see each of the Mumbai Indians home games. Through the sale of the wristbands and additional support, Mumbai Indians was able to gift Rs. 11 lacs to each of the groups at the conclusion of IPL 3.

Community Health Care:- RIL has developed Community Medical Centers near most of its manufacturing divisions. The manufacturing divisions conduct regular health checkups for children in schools of their respective neighbouring regions. Medical camps were organized by all sites benefitting patients from nearby villages and tribal areas.

Drishti:-A unique joint initiative of RIL and National Association of Blind, Project Drishti has undertaken over 9,000 free corneal graft surgeries for the visually challenged Indians from the underprivileged segment of the society. Jamnagar Manufacturing Division runs 'Project Balkalyan', with an objective to provide nutritional support to children affected with HIV infection. The Primary Health Centre (PHC) at Dahej, Bharuch district, adopted by RIL under the National Rural Health Mission Programme caters.

Environment initiatives for the community:- A zero garbage campaign has been launched in Reliance Townships to propagate the concept of solid waste (dry and wet waste) management. This is a part of cleanliness drive for a disease-free environment at employees' township, the surrounding villages of Hazira Manufacturing Division and also Surat city in Gujarat. To reduce plastic litter Hazira Manufacturing Division in partnership with an NGO is working for social and economical security of woman rag-pickers. Under the programme, direct sale of waste PET bottles to processing units is facilitatedThis program is being extended to over 350 slums of Surat.

To bring out the innovative spirit of young students of Surat / RIL employees and also to acknowledge / reward the ideas that can contribute to improving the environment, Hazira Manufacturing Division announced a 'Green Idea Award Scheme' in 2010. RIL organised programmes of industrial, academic, historical and environmental importance such as Chemical Industry-2020 Vision and Action at Ankleshwar; Global Bird Watchers Conference at Jamnagar; Van Mahotsav- 2010 at Palitana; International Conference on Global Warming at Gujarat Vidyapeeth; Conference on Synergy with Energy; Conference on Gujarat's Maritime History by Darshak Itihas Nidhi. Further, tree plantation activities were organaised at many locations. Awareness of cleaner, greener environment and global warming issues are made at schools and also to villages from the surrounding region.

Community Development:- In FY 2010-11, Reliance Rural Development Trust (RRDT) undertook 797 works in 760 beneficiary villages of 125 talukas under 24 districts of Gujarat to create rural infrastructure under the Gokul Gram Yojana (GGY) of the Government of Gujarat. Total 608 facilities got completed during the

year. The completed facilities include 478 Anganwadi buildings, 58 Cement Concrete Roads, 61 underground RCC sumps and 05 Check Dams and 06 other works with the total expenditure of Rs. 24 Crore in FY 2010-11.

The list of other CSR at RIL

1. Livelihood Support Programmes
2. Improving quality of agricultural produce
3. Safety initiatives for community
4. Skill Up-gradation for Plumbers
5. Heritage Conservation
6. Supporting Indian Culture
7. Promoting Sports and Sportsmen
8. Acknowledging and supporting talent
9. Supporting Institutions
10. Reliance Foundation
11. Dhirubhai Ambani Foundation

CONCLUSION

A company considered socially responsible can get benefit both by its enhanced reputation with the public as well as its reputation within the business community. Social action programs create favorable public image[10].

The CSR concept became more and more common in business practices and customers. CSR does not give immediate results. But today CSR is very important for companies. The business of the 21-st century will have no choice but to implement CSR. Like any successful management strategy, a CSR process needs both high level management vision and support, and buy-in at all levels of the company. The same CSR initiative will also not work for all types of organisations.

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EMPOWERING RURAL WOMEN – ROLE OF MICROFINANCE

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ABSTRACT

Microfinance services lead to women's empowerment by positivelyinfluencing women's decision-making power and enhancing their overallsocio-economic status. Microfinance Institution (MFI), a cooperativemovement attempts to eradicate poverty and therebyconfer financial and social empowerment of women. An attempt is to explorethe reasons why MFIs concentrate on economically poor especially women.This paper reveals that this emerging movement has resulted in women'sincreased participation in decision making, gaining self-confidence,overcoming gender discriminations and increased political power and rights.Microfinance is now a proven strategy for reaching poor women. Microfinance both credit and saving has potential to improve the well-being of poor women in developing countries. Microfinance in India has been increasingly promoted to empower women. However, only a few studies examine the link between microfinance and women's empowerment. For the majority of women borrowers, microfinance helps in lifting women out of poverty and achieving economic and political empowerment with their homes. The purpose of this article is to examine the contribution of microfinance to empower the women.

KEYWORDS
Microfinance, Empowerment, Microfinance Institution.

INTRODUCTION

Microfinance is emerging as a powerful tool, reaching out to poor household who have yet to be reached by formal finance sector. Microfinance is an effective intervention for poverty alleviation in early seventies for developing countries. The great visionary and Nobel Prizewinner Prof. Md. Yunus have conceptualized this intervention to eradicate poverty. Credit is one of the most crucial inputs in the process of economic development. Development of economic, social and political dimensions is incomplete without empowerment of women. This inability of credit institutions to deal with credit requirement of poor particularly women has led to emergence of the microfinance.

CONCEPT OF MICROFINANCE

The concept of microfinance can be described as by title of F.A.J. Borman's 1990 book, "Small, Short and Unsecured." Microfinance refers to small scale financial services such as micro-saving, micro credit and micro-insurance to the people who operate micro enterprises which generate income and allowing them to meet financial needs and emergency. These short term loans are enough to start or expand business, weaving baskets, raising chicken or buying wholesale product to sell in the market. The aspect of microfinance has contributed to its success of its credit plus approach where focus has not only been on providing adequatetimely credit to low income groups but to integrate it with other development activities such as community organizing and development, leadership, training, skill and entrepreneurship. The ultimate aim is to attain social and economic empowerment. The microfinance programme has major impact on improving living standard of poor people.

DEFINITIONS

Micro finance may be defined by the as "provision of thrift, credit and other financial services and products of very small amounts to the poor in rural, semi-urban or urban areas for enabling them to raise their income levels and improve living standards" —NABARD.

A definition of microfinance as provided by Robinson is, 'Microfinance refers to small-scale financial services for both credits and deposits- that are provided to people who farm or fish or herd; operate small or micro enterprises where goods are produced, recycled, repaired, or traded; provide services; work for wages or commissions; gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and local groups in developing countries, in both rural and urban areas'. —Robinson (2001)

NEED FOR THE STUDY

It is true that the concept of micro financing was in existence for more than a century. However the micro financing, which has been introduced recently is different, free from exploitation, based on the principle of co-operation and group approach. The question that remains still to be answered is that how these MFIs could succeed in capturing the bulk of population, which were hitherto denied access to credit? How could they succeed in attracting the bankers to volunteer in their doorsteps to extend credit, which was a Herculean task prior to MFI? How could the MFIs handle the micro financing, which resulted in good recovery rate, which was a dream for formal sector? Would this success sustain or would it vanish after a temporary existence? What needs to be done to sustain in future? Given the merits of MFIs, all these questions necessitated to study to emerge in the present form. Development experience has shown that the policies favouring government have failed and market was supported to rule with minimum intervention of the state. In both these policy frameworks, poor had continued to be neglected as their focus was on the rich and believed that the benefit would trickle down. But in the later period the market also failed due to various reasons. It was observed that the poor had failed to benefit through any intervention, as the access to formal Credit was absent. As a result, the informal credit continued to dominant and exploits the poor. The failure of formal credit reaching the poor, due to high risk involved owing to the imperfect knowledge of other borrowers and the associated transaction costs for the banks, informal sector with the virtue of perfect information on the poor borrowers, established a good credit market. It is felt that the poor cannot be helped by formal credit for the paper work, asymmetry of information and the transaction cost associated. On the other hand the informal credit sources should not be allowed to exploit the poor. It is good if the former as the first best reaches the poor. In the absence of this occurring, the second best alternative has been conceived, incorporating certain features of both the characteristics of formal and informal credit in the name of micro financing through MFIs with organized efforts of the participants. This micro financing has the characteristics of group lending, peer monitoring, peer pressure etc., through which it is able to get the full information about that borrowers and extend credit with minimum transaction cost with less paper work, but greater recovery performance. This has been widely recognized as the alternative form of credit and resource mobilization for the poor, credit and thrift management etc., but there are certain issues, which may be research questions to be analysed by future researchers in addition to this study. The MFIs associated micro financing is targeted to mostly women. The experience has shown that the economic activities have not been crossed beyond the micro scale. The women who have been taken up economic activities, hardly promoted to produce products of global importance.

In the above back drop an attempt is made in this study to examine the role and impact of microfinance in empowering rural poor and problem encountered by respondents/ beneficiaries and suggest remedial measures to overcome these problem in order to encourage and promote empowerment which has got great potential in Indian environmentparticularly. The specific objectives of the study are as follows:

OBJECTIVE OF THE STUDY

Micro finance is currently growing at a very fast rate. Micro finance is no doubt providing facilities for the rural poor but to what extent is not clearly mentioned anywhere. Hence that is a for an in-depth impact studies with the following objective:-

Does women access to microfinance leads for empowerment?
What kind of Empowerment Impact do the MFIs create?

METHODOLOGY

The present study has been conducted in Andhra Pradesh with the objective of studying the impact of microfinance on rural poor. The sample constituted 100 beneficiaries selected across the state of Andhra Pradesh. The study was based on primary data collected through structured questionnaire schedule as well as secondary data. The following parameter was broadly studies to promoted microfinance beneficiaries. The information was also collected through discussion with development functionaries.

PERIOD OF THE STUDY

The present study cover a period of five years from 2002-2007 (Tenth Five year plan) in order to draw trend to empowering rural poor through microfinance in the state of A.P.

DATA ANALYSIS

The data collected from the field was processed using two software package viz. excel and SPSS (Statistical package for Social Science) quantitative information was cross tabulated to know social and economic dimension of each variable and its association with other factors a qualitative information was used in the interpretation of the quantitative data. The Study provides analysis of data and results of the study area. The study interprets and discussed the results of the investigation focused on the impact of microfinance on rural poor in Andhra Pradesh state the results pertaining to the hypotheses and their detailed discussions were presented in this study. Finally the comprehensive discussion is presented.

LIMITATION & PROBLEM OF DATA COLLECTIONS

During the research several problems faced several problems were related to lack of availability of data and of persons concerned such as these include:-
Non availability of official is other serious problems. Secondary data up to date was not available and hence no cross checking could be done comparing the primary and secondary data.
The microfinance stakeholder / MFI who misused funds were not willing to show their records with the excuse that their leaders was not in the village or that the books were in a relative's house and the key were not available etc.,

WHY MICROFINANCE TARGET WOMEN?

From traditional days women are facing discrimination in terms of access to creditand other financial services. All financial institutions invariably neglect women whomake up a large and growing segment of the informal economy. In contrary,microfinance makes sense from the public policy standpoint of targeting 85 per cent ofwomen clients since they register high repayment rate and contribute a largerproportion of household income.Why should the MFIs focus on women? To answer this question Palier identifies four arguments: a) Feminization of poverty b) Financial services offer a uniqueopportunity for greater empowerment of women c) Overcome gender discriminationfor enhanced economic growth d) Financial uplifts are widely distributed withinhousehold and community *(Palier, 2005)*. Economist and researcher have shown thatinvestment on women can broaden the returns of the economic development sincewomen play a critical role in various aspects of strengthening the household income, family's health and nutrition, education of children which could possibly result insocial and psychological empowering.

REASONS TO TARGET WOMEN

1. GENDER AND DEVELOPMENT: A recent World Bank report confirms that societiesthat discriminate on the basis of gender pay the cost of greater poverty, slowereconomic growth, weaker governance, and a lower living standard of their people *(World Bank, 2001)*. Microfinance has developed a framework that wouldsuccessfully empower the women in all aspects. Attention to gender equality isessential to sound development practice and at the heart of economic and socialprogress. Development results cannot be maximized and sustained without explicitattention to the different needs and interests of women and men *(CIDA, 1999)*. Bygiving women access to working capital and training, microfinance helps inmobilizing women's productive capacity to alleviate poverty and maximize economicoutput and thereby resulting in economic empowerment.
2. FEMINIZATION OF POVERTY: The Human Development Report states that 70per cent of 1.3 billion women receive less than $1 per day. This is due to higherunemployment rate, low paid and unorganized informal sector when compared tomen. Women are more vulnerable because of the weaker basic entitlements and lesschance of escaping from poverty (*Baden &Milward, 1995)*. By providing access tofinancing for income- generating activities, microfinance institutions can significantlyreduce women's vulnerability to poverty. A reduction in women's vulnerability cansometimes also translate into empowerment if greater financial security allows thewomen to become more assertive in household and community affairs.
3. MARGINALIZING INCOME FOR HOUSEHOLD ACTIVITIES: Women's success benefitsmore than one person. When a women's income is increased the whole family incomeis increased. Women are more likely than men to spend their profits on household andfamily needs thereby generating a multiplier affect that enlarges the impact of theinstitutions' activities. There is some valid reason why women are better served i.e., theincentives brought will bring some new options (Kabeer, 1999). Women who are empowered will have the power to make the life choices that are best for them and theempowered women will choose to invest in their families and community development.
4. EFFICIENCY AND SUSTAINABILITY: Sustainability states repayment records and cooperativeness. Lower arrears and loan loss rates have an important effect on theefficiency and sustainability of the institution. Programs that serve a significantnumber of men are more likely to use methodologies that require collateral and moreextensive monitoring procedures to help reduce the risk of default, while programsdesigned to serve primarily women tend to replace formal monitoring procedures withsocial guarantees. Generally, MFIs are able to balance more costly procedures withlarger loans, while many institutions targeting women have relied on client capacityfor self-monitoring and cooperation to reach out to women who otherwise might havebeen excluded because of the small amount of capital they require.
5. WOMEN'S RIGHTS PERPECTIVES: Women's equal access to financial resourcesis a human rights issue. Because access to credit is an important mechanism forreducing women's poverty it has been an explicit focus of a variety of human rightsinstruments.
6. WOMEN EMPOWERMENT: Microfinance is an effective means or entry pointfor empowering women. By putting financial resources in the hands of women, microfinance institutions help level the playing field and promote gender equality.The empowerment of women at the individual level helps build a base for socialchange. Movements to empower women as a group increase opportunities available toindividual women, and economic empowerment can increase women's status in theirfamilies and societies.

WHAT KIND OF EMPOWERMENT IMPACT DO THE MFI CREATE?

The process of empowerment varies from culture to culture, from society to societywhich may show a different set of results like increased participation in decisionmaking, gaining self-confidence, overcoming gender discriminations, increasedpolitical power and rights and few other to be mentioned.
1. Decision making: Women ability and influence to take up a decision isdependent on what type of decision and the degree of participation in decision makingprocess. A study conducted on Women's Empowerment shows that an average of 68per cent of women in its program experienced an increase in their decision-making rolesin the areas of family planning, children's marriage, buying and selling property, andsending their daughters to school—all areas of decision making traditionally dominatedby men *(Ashe & Parrott, 2001)*. A report on World Education found that thecombination of education and credit put

women in a stronger position to ensure moreequal access for female children to food, schooling, and medical care. In a study of theSmall Enterprise Development Program (SEDP) in Bangladesh, Naila Kabeer found that although empowerment and well-being benefits substantially increased whenwomen controlled their loans and used them for their own income-generating activities,just the act of bringing financial resources to the household in the form of credit wasenough to secure at least some benefits for the majority of women in her study.

2. Self –Confidence: A difficult area to measure in terms of empowerment but itrelates with the women's perception and actual level of skill and capabilities. Anyprogram of its nature will bring a drastic change in terms of self-confidence and self-esteem. The increased result will show an improved effect in the level of knowledgein understanding the issues around themselves and business knowledge that willimprove the financial conditions.

3. Women Status and Gender Indiscrimination: Traditionally this society isdominated by men in general. Due to new and improved roles by women shows animproved relationship with men within the household. All the people at home mayhelp the women but the process of managing gets a difficult task when it comes for utilizing loan. Hence the economic role of women remains sustained and it has notlead to substantial changes.

4. Family relationship: Microfinance strengthens and improves familyrelationship rather than destroying it. Research fellows have identified that familyrelationship have improved and home has become a comfortable place to live in andthis results in her contribution productively and lessen the case of abuse. A study on theimpact of rural credit program states fear of public exposure clearly played a role in thereduction of violence but there is considerable anecdotal evidence of women attributingthe reduction of abuse directly to their access to credit and their economic contributionto the household. Another study suggests that the level of women's economiccontribution to the family may also be significant *(Hashemi& Schuler, 1996)*.

5. Women Involvement in the community: Since women are making financialcontribution to their family they confer greater legitimacy and value than ever before.Women also perceive more respect and dignity from the male counterparts once afterfunctionally joining microfinance program. If given a freedom to move the success isinvisible which can pave for gaining self-respect and value from the society.

6. Political participation and Women's rights: MFIs do concentrate onmobilizing the political skill of the women through an advocacy of programmes thatmay nurture their knowledge of participating in political parties, exhibiting theleadership styles, representing the elections and mobilizing the group. Manymicrofinance programs give women the tools and skills they need to participate moreeffectively and successfully in formal politics and to informally influence decisionsand policies that affect their lives.

RETHINKING OF BEST PRACTICES

Microfinance institutions have realizedproviding women with access to credit that does not necessarily translate to increasedfinancial or social empowerment but also produce tangible and long-lasting result.Women are considered to be socially economic returns for herself, family andcommunity. With these perspectives, MFIs can evolve some strategies that wouldwork as a successful strategy in optimizing the women's potential for the wellbeing ofthe society and welfare of the nation.Adjustments in financial services that would better serve women's need: Needbased or client specified products has to promoted by MFI's. Individualized or genderdiscriminated product which reduce vulnerability, adjust collateral requirements andencouraging property to be registered in women's name are the essential componentsof gendered microfinance.

More than financial services: Access to credit is not the one aspect of MFIsfunctioning. Programmes such as adult literacy and business training programs, canfacilitate women's access to better jobs and income-generating opportunities and areperhaps the most effective means of promoting gender equalityCommunity Awareness Marketing. Marketing campaigns directed at womencan positively influence both men and women's attitudes on women's status andemployment in the community by helping male community members acceptеconomic opportunities for women, by building women's self-confidence and byfacilitating community approval of women's projects.

Strengthening Women's Network: Network among women has to bestrengthening not only for the credit but also for non-financial service delivery likehealth and literacy programs. Groups also encourage linkages between women andother active community associations and the larger civil society network as a whole.5. Change in microfinance delivery: Since saving plays a crucial role inincreasing the amount of income and assets a proper system of saving schemes likerevolving savings, credit associations can be designed to maintain the financialsustainability of women.

Changes in group structure & functions: Instead of female network alone therecan be some combinations of male network, development of new models withingroups, imparting training and leadership skills for mainstreaming,transmission/dissemination of knowledge within or other group for business trainingcould be some best practice for MFIs.

MICROFINANCE INSTRUMENT FORWOMEN'S EMPOWERMENT

Microfinance is emerging as a powerful instrument for poverty alleviation in new economy. Micro finance for the poor and women has received extensive recognition as a strategy for poverty reduction and for economic empowerment. Increasingly in the last five years, there is questioning of whether micro-credit is most effective approach to economic empowerment of poorest and among them, women in particular, Development practitioners in India and developing countries often argue that the exaggerated focus on microfinance as a solution for the poor has led to neglect by the state and public institutions in addressing employment and livelihood needs of the poor.

Credit for empowerment is about organizing people, particularly around credit and building capacities tomanage money. The focus is on getting thepoor to mobilize their own funds, building their capacities and empowering themto leverage external credit. Perception women is that learning to manage money and rotate funds builds women's capacities and confidence to intervene in local governance beyond the limited goal of ensuring access to credit. Further, it combines the goal offinancial sustainabilitywith that of creating community owned institutions.

Before 1990's credit schemes for rural women were almost negligible, The concept of women's credit was born on the insistence by women oriented studies that highlighted the discrimination and struggle of women in having the access of credit. However, there isa perceptiblegap infinancing genuinecredit needs of the poor especially women in the rural sector.

There are certain misconception about the poor people that they needs loan at subsidized rate of interest on soft terms, they lack educational skill, capacity to save, credit worthiness and therefore are not bankable. Nevertheless, the experience of several SHGs revealsthat rural poor are actually efficient manager of credit and finance. Availability of timely and adequate credit is essential for them to undertake any economic activity rather than credit subsidy.

The Government measure has attempted to help the poor by implementing differentpoverty alleviation programmes but with little success. Most of them are target based involving lengthy procedures for loan disbursement, high transactioncost and lack of supervision and monitoring. Since the credit requirement of the rural poor cannot be adopted on project lending approach as it is in the case of organized sector, there emerged the need for an informal credit supply through SHGs. The rural poor with the assistance from NGOs have demonstrated their potential for self-help to secure economic and financial strength. Various case studies show that there is a positive correlation between credit availability and women's empowerment.

CHALLENGING ECONOMIC EMPOWERMENT

It is clear that women's choices about activity and their ability to increase income are seriously constrained by gender inequalities in access to other resources for investment, responsibility for household subsistence expenditure, lack of time because of unpaid domestic work and low level of mobility, constraints on sexuality and sexual violence which limit access to markets in many cultures.

These gender constraints are in addition to market constraint on expansion of the informal sector and resources and skill constraint on the ability of poor men as well as women to move up from survival activities to expanding business. There are sign, particularly in some urban market like Harare and Lusaka that the rapid expansion of microfinance programmes may be contributing to market saturation in female activities and hence declining profits.

CHALLENGING WELL-BEING AND INTRA HOUSEHOLD RELATION

There are undoubtedly beenwomen whosestatus in the household has improved, particularly where they have become successful entrepreneurs. Even where income impact have been small, or men have used the loan, the fact that microfinance programme have thought women worth targeting and women more negotiating power.

Savings provide women with a means of building up an asset base. Women themselves also often value the opportunity to be seen to be making agreater contributionto household wellbeing giving them greater confidence and sense of self-worth. However women's contribution to increase income going into household does not ensure that women necessarily benefit or that there is any challenge to gender inequalities within the household. Women's expenditure patterns mayreplicate rather than counter gender inequalities andcontinue todisadvantage girls. Without substitute care for small children, the elderly and disabled and provision of services to reduce domestic work many programmes reported adverse effect of women's outside work on children and the elderly. Daughters in particularly may be withdrawn from school toassist their mothers.

CHALLENGING SOCIAL AND POLITICAL EMPOWERMENT

There have been positive changes in household andcommunity perceptions of women's productive role, as well as changes at the individual level. In societies like Sudan and Bangladesh where women's role has been very circumscribed and women previously had little opportunity to meet women outside their immediate family, there have sometimes been significant changes. It is likely that changes at the individual, household and community level are interlinked and that individual women who gain respect in their household, then act as role model for other leading to a wider process of change in community perceptions and male willingness to accept change.

Microfinance has also been strategically used by some NGOs as an entry point for wider social and political mobilization of women around gender issues. However there is no necessary link between women's individual economic empowerment and/or participation in microfinance groups and social and political empowerment. These changes are not anautomatic consequence of microfinance. As noted above, women's increase productive role has also often had it costs. In most programmes there is little attempt to link microfinance with wider social and political activity. In the absence of specific measures to encourage this there is little evidence of any significant contribution of microfinance. Microfinance groups may put severe strains on women's existing networks if repayment becomes a problem. There is evidence to the contrary that microfinance and income earning may take women away from other socialand political activities.

The evidence therefore indicates that contributions of microfinance per se to women's empowerment cannot be assumed and current complacency in this regards is misplaced. In many cases contextual constraints at all level have prevented women from accessing programmes, increasing orcontrolling income or challenging subordination. Where women are not able to significantly increase income under their control or negotiable changes in intra-household and community gender inequalities, women may become dependent on loans to continue in very low-paid occupations with heavier workloads and enjoying little benefit.

All the evidence suggests the poorest women are the most likely to be explicitly excluded by programmes and also peer groups where repayment is the prime consideration and/or where the main emphasis of programmes is on existing micro-entrepreneurs. It also suggests that even where they get access to credit, they are particularly vulnerableto falling further into debt.

IMPACT OF MICROFINANCE TO EMPOWERING RURAL WOMEN

As observed in the study areas also the microfinance have helped participation families to improve their economic conditions and also contributed for empowerment of rural poor. It also contributed for the improvement of the performance of some branches. The chapter analyses the impact of microfinance on economic condition of the families' and participating on rural poor. Here the members perception were only considered in analysing the impact respondents were asked to choose option (a) Same condition (b) Increase (c) decrease to each of select economic and social development indications. Respondents response in presented as the table. Now an attempt is made to analyse the impact of microfinance in empowering sample respondents in terms of socio-economic and cultural up-gradation. Since the study is largely a rural based, where a good number of members are uneducated and fail to maintain accounts. The respondents were not in a position to provide the correct data relating to income, saving etc., at individual level, therefore, the data relating to direction of changes from the period of membership was obtained in terms of (a) same (b) increase (c) decrease

The socio-economic conditions of members have improved since joining the groups the positive changes have been reported in case of awareness regarding nutrition, health hygiene, family planning, decision making related to money cantered, interaction with outsiders mobility, educational development access to health services, family income etc., Important aspects, most of the agreed on the important of non-business related training the domains of food, health , empowerment and decision-making, family planning. under this section indictors include increase in food expenditure, improvement in health, less dependence on others, increase in education, increase in confidence level, decision-making , leadership qualities, group solidarity and ability to interact with others.

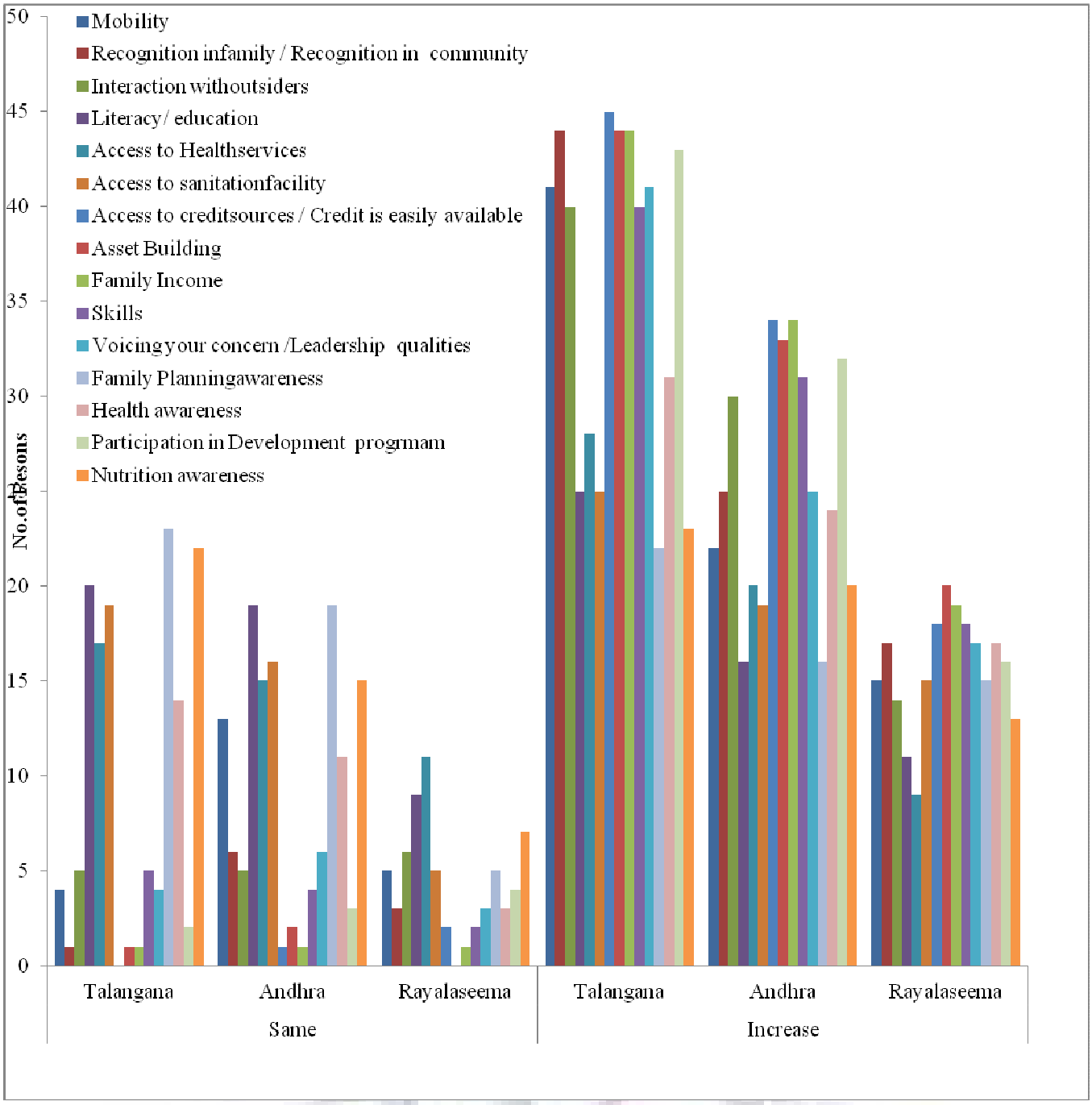
Positive impact of microfinance was observed in terms of increased income, diversification of household activities and reduce dependence on the single main occupation of the household, larger employment opportunities. General improvement in their quality of life including housing conditions and education of children - particularly girl child, reduced dependence on the money lenders, largely spending on social occasions like festival and marriages, tendency to increase borrowing.

TABLE NO. 1: IMPACT OF MICROFINANCE TO EMPOWERING RURAL WOMEN

	Same			Increase		
	Talangana	Andhra	Rayala-seema	Talangana	Andhra	Rayala-seema
Mobility	4	13	5	41	22	15
Recognition in family / Recognition in community	1	6	3	44	25	17
Interaction with outsiders	5	5	6	40	30	14
Literacy/ education	20	19	9	25	16	11
Access to Health services	17	15	11	28	20	9
Access to sanitation facility	19	16	5	25	19	15
Access to credit sources / Credit is easily available	-	1	2	45	34	18
Asset Building	1	2	-	44	33	20
Family Income	1	1	1	44	34	19
Skills	5	4	2	40	31	18
Voicing your concern /Leadership qualities	4	6	3	41	25	17
Nutrition awareness	22	15	7	23	20	13
Family Planning awareness	23	19	5	22	16	15
Health awareness	14	11	3	31	24	17
Participation in Dev. program	2	3	4	43	32	16

Source: Compiled from questionnaire data

GRAPH NO. 1: IMPACT OF MICROFINANCE TO EMPOWERING RURAL WOMEN



MOBILITY

Rapid changes in female/male relationship in terms of increased freedom, autonomy and mobility for example after some initial frication a women could stay overnight in another village to market her products and another could take part in a week long seminars/trainings. Rises inthe income of rural poor, increase the livelihood children attending school participating when programhave an education component.Majority member used microfinance amount more than one purpose. All the respondents utilized the microfinance for assets building, family income increase, and income generation activity. Some spent on a significant impact on household on loan borrowers inmultiple waysinclude employment generation, financial support from moneylenders, children's education health, and debt status and so on.

ASSET BUYILDING

Data shows that over 97 per cent of the respondents have reported that asset building 97%. Majority of the respondent also felt that the loan is need based. Stakeholder positive responses were tabulated positively all listed indicators. Impact is also analysed from with the information during their interviews with the research and the opinions expressed.

RECOGNITION IN COMMUNITY

Important point which come out during the discussion was that earlier the relative/friends / neighbours were apprehensive to give loan to them, as they were not sure about their capacity for repayment, but now the member can get easy loan form them in case of emergency as they are source to get money.Regarding the esteem that they feel within their couple, 86% of respondents declare that their professional activity has positively affected the perception that their spouse or partner shows them as a result of participation in a microfinance program or development of the microfinance. The trend is similar regarding the esteem that the microfinance within their family and community.

INTERACTION WITH OUTSIDERS

An analysis from reveals that on the whole, a majority of 84 per cent of the respondents of microfinance reported that there was a positive changes of interaction with outsiders 16 per cent respondents were reported that there is no changes. This clearly indicates the higher involvement of members in decision-making. This is good sign toward the social and transformation taking place due to microfinance movement.Microfinance stakeholders interact with outsiders with a degree of sophistication and self-worth not seen among rural poor in past. The rural poor in mobile and is used to an independent income and therefore, always has had the advantage of greater freedom than the richer poor.

EDUCATION

When it comes to education nearly 52 per cent of respondents reported noticeable for significant improvement in educational level. Nearly 48 per cent, however, reported no change respondents have borrowed for children's education and improvement was probably related to children's education on their own behalf respondents have invested in learning to sign their names, but not much more in terms of formal education. Their knowledge level, information base ability to analyse and articulate, all of which are part of education of a person appear to have improved significantly over the year with their microfinance. 40% of clients who have children perceive a positive change in their level of education thanks to their participation in microfinance programs. While it is possible to state that the duration of participation in microfinance program improves the education of children.

ACCESS TO HEALTH SERVICES

Nearly 57 per cent reported noticeable to significant improvement in health status only 43 per cent respondents no change in health status. Microfinance provides rural poor right to borrow for their own health needs, a part from all other occupational and family needs. In the case of the poor personal health management reflects directly on earnings as the poor depends significantly on physical energy for their income, poor tend to poor their own health needs last, but membership in the microfinance provide them with the opportunity to invest in the own well beings.On decision-making power, self-confidence, leadership, self-reliance and group solidarity member perception was that there was clear change for the better. However 43 per cent of member said that there was either no-change or in-significant improvement in health status with 57 per cent. There weresimilar responses tochange in educationlevel and intheir participation in microfinance. Overall the proportion of client household having treatment at private hospitals increase sharply at the expenses of others modes of treatments. Larger number of clients showed preference for child birth at government hospital rather than at home or at the public health service. The clients with longer association with microfinance institution had more preference for private hospital theywere ready tospend more inthe case of child delivery.

ACCESS TO CREDIT SOURCES / CREDIT EASILY AVAILABLE

The benefits obtained by the member of microfinance after their entry was analysed by taking into following variable such as increase income level, better to credit facilities, better socio-economic status. Enhance the leadership quality, independence self-decision making habits, improves the standard of living provides regular income. Reduce the stress and participation in public affairs through average score analysis.Promoted groups positively responded for the indicator increase in expenditure on food. As mentioned earlier that normally an increase in expenditure on food brings equity in intra family distribution of food. It reflects significant changes and gains.The biggest impact on the lives of the member's was their social empowerment. They had acquired a level of confidence, awareness, and pride themselves. Besides, the member had improved problem solving situations and there was a general increase in the self-confidence.Researches finding out income have increase due to their participation in microfinance by taking up new livelihood activities. Women are also able to generate additional income for the families and able to raise families standard of living. By taking activities like mid-day meals, vegetable cultivation and animal husbandry and general additional employment for themselves and their family and able to meet small expenditure need such as consumption, health and educations.

IMPACT ON FAMILY INCOME

Under family income impact the indicators considered are change in household income, change in employment days, savings availability of credit, in-debt ness and free from money lenders. Impact related indication is give as table the development of the habit of saving is widely felt gain as many as 97% of sample respondents positively to this indicators.It is clear from the table, a great majority of 97 per cent of respondents of microfinance reported that their income was increased while remaining 3 per cent of the respondent s reported that there was no change in their family income.

VOICING YOUR CONCERN/ LEADERSHIP QUALITY

More than 83 per cent of members reported noticeable significant increase in leadership quality and a very small per cent of respondents felt that there was no change in their voice or leadership quality. On the question of improvement inleadership qualities nearly 87 percent reported a moderate to significant increasein these, while nearly 13 per cent reported insignificant improvement. Leadership of microfinance stakeholders requires skill of negotiation of ability to represent group interest elsewhere of conflict resolution of funds management of accordingly functions. At least on some of these counts, members appear to have had significant improvement

NUTRITION AWARNESS

Increase in expenditure on food normally bring equality in intra-household food distribution, before turning to analysis of social impact a word of caution, as it take long-time and need multi-pronged strategy for changes in gender equality and social development.

PARTICIPATION IN DEVELOPMENT PROGRAM

Better access to credit facilities was benefit obtained by the members of microfinance after their entry, participation in public affairs. Provide regular income, reduces the stress, self-decision-making habit. Improve the standard of living, increased income level independence. Enhance the leadership quality and better socio-economic status is the following benefit obtained bythe member of microfinance after the entry. Governance related parameters are periodicity of meeting, attendance of the meeting, decision-making process in the meeting, observation of norms saving, and loan instalments, collection method, lending procedure rotation of leadership etc.,Economic parameters include periodicity of saving, use saving for internal lending, lending rates, lending norms, regularity of loan, repayment etc.,Data suggest that the sample respondents who belong to microfinance are much more aware about the services offered by the various organizations and have visited these organizations and have availed the service more often than the not participate members.

The following suggestions have emerged from the study to strengthen microfinanceInitiatives for women empowerment:

1. Though Income Generating Activities promoted through the experiments studied were found to be low in number, it is inspiring to note that microfinance has succeeded in meeting the immediate consumption requirements of the poor families. Otherwise, these families were forced to be the clients of the local money lenders.
2. In most of the group based enterprises, group solidarity was found to be a major problem. In order to circumvent this issue, proper group based training and awareness programme must be organised.
3. The bank linkage of the SHG groups was literally low and hence this has bearing on the quantum of loan availability. So, the promoters of the SHG should take serious attention in maximum SHG-bank linkage so that adequate loan for economic activities will be available.

4. Since there are various women groups in the same locality under various organisations involved in microfinance activities, it is high time to think of forming a consortium of SHGs for planned empowerment of women and to strengthen the overall development of the countryside rather than their piecemeal efforts.

CONCLUSION

It is concluded that microfinance has proved it too successful in empowerment of women reducing dependency on money lenders, easy access to credit to their members and savings and moderate economic benefits. There has been tremendous growth in the progress of Microfinance. Microfinance programme has been a major effort to connect thousands of beneficiaries across the country with formal banking system. Till the recent past, microfinance programmes have confined themselves to distribution of loan to women but receipt of a loan and utilization of loan is guarantee of improving economic status of women.

Microfinance through has reached the un-reached rural poor. There is need to evolve an informal micro financing through formal financial institutions. The massive growth of microfinance has paved the way for immediate financial accessibility for the poor who are too far away from this accessibility and microfinance. Microfinance is an alternative system of credit delivery for the poorest of the poor. It would help in improving the quality of life in rural India. The government of India can play vital role in encouraging. MFI should come forward and extend facilities especially in empowering rural poor by providing education (training), motivation, and financial help and so on. MFI bring unity and integrity among the members. It improves general welfare of family and community. MFI assist the rural poor to perform traditional roles better and to take up micro entrepreneurship.

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ROLE OF E-LEARNING IN EDUCATION: A STUDY OF UNIVERSITY OF JAMMU

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ABSTRACT

The emergence of Information and communication technology has its impact on all the diversified fields and education is not an exception. Today the availability of e-resources and their use in libraries are very common. E-learning is a form of learning in which the educational process is supported by information and communication technology (ICT). Thus, e-learning has become a dominant delivery method at workplace learning setting across organizations of various sectors and of varying areas. Although many organizations are recognizing the potential of e-leaning to bring closer the employees, there appears to be some issues to be addressed in delivering e-learning. The present paper is an attempt to examine the attitude of university students towards e-learning and its role in imparting education to them. The paper also highlights the difference in the attitude of perception towards e-learning based upon gender.

KEYWORDS

E-learning, Information and Communication Technology (ITC).

INTRODUCTION

The term e-learning is defined and used differently by different institutions and user groups. It covers a wide set of applications and processes such as computer-based learning, web-based learning, virtual classrooms, and digital collaboration. Web-based or online learning is, therefore, a subset of e-learning delivered through Internet, Intranet, and Extranet (LAN or WAN). In another words, e-learning is basically a method for the delivery of a learning package (information, communication, education and training) using a combination of multimedia with a view to presenting a course of instruction in an interactive format. Thus, e-learning is just one of the many terms which are used in literature and business about e-learning. E-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked or not, serve as specific media to implement the learning process. The term will still most likely be utilized to reference out-of-classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. E-learning is essentially the computer and network-enabled transfer of skills and knowledge. E-learning applications and processes include Web-based learning, computer-based learning, virtual classroom opportunities and digital collaboration. Content is delivered via the Internet, Intranet or Extranet, Audio or Video tape, Satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio.

Tom Kelly and Cisco (2001), revealed that e-learning is about information, communication, education and training. Regardless of how trainers categorize training and education, the learner only wants the skills and knowledge to do a better job or to answer the next question from a customer. It may be also defined as the potential to provide the right information to the right people at the right times and places using the right medium. Brandon Hall (2007) defined as the instruction that is delivered electronically, in part or wholly via a Web browser, through the Internet or an intranet, or through multimedia platforms such CD-ROM or DVD." Brandon Hall argues that, as the technology improves, e-learning has been identified primarily with using the web, or an intranet's web. Increasingly-as higher bandwidth has become more accessible-it has been identified primarily with using the Web, or an intranet's web, forcing the visual environment and interactive nature of the web on the learning environment. Learning Circuits (2001), e-learning covers a wide set of applications and processes such as web-based learning, computer-based learning, virtual classrooms and digital collaboration. It includes the delivery of content via the Internet, intranet/extranet, audio and videotape, satellite broadcast, interactive TV and CD-ROM. Rosenberg (2001), defined e-learning as the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance." Rosenberg claims that e-learning is based on three fundamental criteria:

1. E-learning is networked, instant updating, storage and retrieval, distribution and sharing of information is therefore possible.
2. E-learning is delivered to the end-user via a computer using standard internet technologies.

E-learning focuses on the broadest view of learning: learning solutions going beyond the traditional paradigms of training.

NEED AND SIGNIFICANCE OF THE STUDY

E-learning refers to learning and other supportive resources that are available through a computer. E-learning comprises all forms of electronically supported learning and teaching material. The information and communication system, whether networked or not serve as specific media to import the learning process. The term will still most likely be utilized to reference out of classroom and in classroom's educational experiences via technology. The different technology features used in the e-learning systems are not really that new, and have been used sporadically for team management for many years. An advantage of this comprehensive all- in- one system is that they do not usually require expensive hardware and software to operate. Features such as e-mail, discussion boards, live chat, document attachments, digital drop boxes, lists of Web hyperlinks and so on were available in various places at many institutions.

Students can use a regular home personal computer with Internet access. However, just as groups of individuals are not teams unless they are interacting and interdependent (Robbins, 2000), groups of technology tools such as those listed above are not a useful cohesive system unless they are organized effectively. There is a positive synergy that results from these types of electronic tools when they are coordinated together to help yield higher performance through convenience, accessibility, and structure of the design. They are becoming widely used at educational institutions and corporate training programs for Web enhancement of on- campus programs or fully virtual distance learning courses. These systems are not expensive, easy to use, technology stable, upgradeable, and very convenient to use from home or the work site. Given below the definition which show the significance of e-learning.

"E-learning provides the potential to provide the right information to the right people at the right times and places using the right medium."

So, the researcher decided to take this topic as she felt that only through the computer, we can expect better knowledge to students which are very essential for better society and a developed nation. As not much work was done in this area and find out whether the University students were knowledgeable or not, the researcher decided to take up this topic.

OBJECTIVES OF THE STUDY

The following objectives shall be realized through the study:

1. To study the attitude of the university students towards e-learning.
2. To study the difference in the attitude of perception towards e-learning based upon gender.

REVIEW OF LITERATURE

The present study is an attempt to add one grain in the vast field of educational research. It is presumed that the survey of related studies will make the present investigation more correct and to the point. It enables the researcher to perceive the gap in the concerned field. Some of the studies conducted on e-learning or Online-education are as following:

Jeekim and Bonk (2011) in a recent study revealed that e-learning has become a dominant delivery method in workplace learning setting across organizations of various sectors and of varying areas. Although many organizations are recognizing the potential of e-leaning to bring closer to employees, there appears to be some issues to be addressed in delivering e-learning. It has also been emphasized that technology tools might still be on the periphery of our learning radar screens are about to be adopted widely by those who serve. Thus, there is need to develop an understanding of and familiarity there now, the learners who currently turned to us behind (Signorelli, 2010). Kramer and Seeler (2009) discussed the need to evaluate student's performance in On-line distance education course. It focuses on so called "generic" or "key" competencies, which are increasingly in termed as part of academic competence goals. Also, the work on e-learning and e-infrastructure have been adopted most widely. E-learning is preferred to "On-line learning" as it appears to be considered a more often comparing term across the countries (Venkatraman, 2009). It has been seen that learner identity needs to and can be developed in our rapidly changing digital globalised world. Two tools for learning are discussed in relation to this notion of development of learner identity and personalised learning. The first is the V-ResORT (Virtual Resources for Online Research Training) The second tool for learning is the Virtual Interactive Platform (Joyes, 2008).

Robertson (2008) proposed that activity theory is a theoretical framework that provides the potential to contribute to change management towards sustainable e-learning. Activity theory provides an opportunity for the assumptions, values and beliefs that underpin each system to be made more explicit. With debate, discussion and critique, expansionist learning becomes possible. Major conclusions of the study are that any change management towards sustainable e-learning must address the power dynamics that occur at the interface of the activity systems and that professional development for teachers must address teacher's beliefs about what constitutes good teaching practice. Sulcic and Sulcic (2007) tried to present online tutoring as a solution to quality issues of e-learning that e-learning providers from all over the world are facing. The study briefly presented different roles of online tutors and the skills needed to perform these roles successfully. The online tutoring system was introduced to support students of e-learning courses at the faculty. The researches showed that tutors can improve study outcomes (although not so much students' grades) and that their activity is well accepted by students (especially part-time students).

E-learning is a form of learning in which the educational process is supported by information and communication technology (ICT). With the gradual introduction of ICT in traditional education, the teaching/learning methods were transferred to traditional education because of their innovative approach to teaching and learning. In this context new forms of learning emerged, varying from computer based learning, online learning, web-based learning, e-learning etc. All these new forms of learning that use ICT can therefore be called e-learning. Modritscher (2006), studied that e-learning and distance learning tend to get more and more important for all kind of organizations, researchers and practitioners are becoming aware of the fact that a simple technology-focused approach does not guarantee successful teaching and learning. Thus, a shift to pedagogy-based initiatives can be observed within the field of e-learning. The study examined the implications of commonly known learning theories on online courses. Siragusa and Dixon (2005) studied the development of sound instructional design principles for online learning in higher education needs to draw from the vast body of literature which reports on the findings of research into instructional technologies, cognitive learning theories and adult education (Reeves & Reeves, 1997). Through an examination of learning theories, learning philosophies, instruction design principles, student learning in higher education and online learning technologies, it has become clear that research into online learning needs to involve more than just an examination of an online study such as WebCT. Ongoing evidence from the literature suggests that the maturation of online delivery will be realized once innovators develop appropriate models for instructional design and realistic strategic and pedagogical approaches as we move further into the twenty first century. Curran (2004) examined the e-learning strategies adopted by universities, from the perspective of three common objectives: widening access to educational opportunity; enhancing the quality of learning; and reducing the cost of higher education. E-learning has grown significantly over the last decade to become a significant mode of instruction in higher education. If as yet neither as ubiquitous or influential as some early proponents predicted, few doubt that it has the potential to become a substantive pedagogy – and one, perhaps, with a pervasive influence on tertiary teaching. Garrison & Kanuta (2004) studied the framework which explores how integrating online learning into traditional college classrooms could be transformative for universities. Blended learning represents an opportunity to support deep learning. The authors build on earlier work using community of inquiry model to support why institutions should invest in transforming learning. The paper outlines what colleges and universities need to do to move forward blended learning. Boyle et al (2003) studied ways to improve student's success rate in learning to program. The project team introduced a number of changes in module organization, tutorial support and online resources. The blend represents a mixture of traditional and novel elements, with the novel elements more marked in the online developments. Results demonstrated marked improvements in pass rates. Evaluation of the students' use of the new environment indicated a generally positive evaluation of the main elements of the blend and widespread use of the new online features. Schweizer, Paechter &Weidenmann (2003) examined how groups of learners work together in blended learning and e-learning environments. Three pure e-learning courses were compared to one blended learning course where participants formed learning teams who met at three points in time. All participants received joint learning material, in order to build shared knowledge, and individualized information to build unshared knowledge. Variables analyzed include students' extent of online activity, the groups' task performance, and coherence of the groups' discourse. Results indicated that achievement in a particular group does not depend solely on the mode of communication used in the course.

From the above literature review it has been seen that various attempts have been made in this context from time to time to understand the concept of e-learning or on-line learning. Thus, there is a gap to proceed further, the researcher attempts to know the role of e-learning in education

RESEARCH METHODOLOGY

The present study has been conducted among the students of the University of Jammu, state Jammu and Kashmir. This sector was chosen for the study, as it is one of the biggest education sector which deal with the common mass. Also, this study will be helpful in evaluating the attitude of the select students towards e-learning. For the purpose of the given study primary as well as secondary data was used. The Secondary data was collected from various books, journals, published research papers, websites etc. The primary data was collected by means of a questionnaire. Copies of the questionnaire were given personally to respondents in the university. The questionnaire contained a total of 26 items with 5-point Likert scale ranging from 1-strongly disagreed to 5-strongly agreed. The sample is randomly selected and 200 respondents were personally meet to give their responses. The data collected was mainly primary in nature.

ANALYSIS AND INTERPRETATION OF DATA

The study deals with the analysis of attitude of students of University of Jammu towards e-learning. The responses from the respondents were subjected to simple percentage method, mean score and ANOVA was used in order to know the gender differences towards e-learning.

DEMOGRAPHIC PROFILE

For the purpose of the study about the demographic profile of the students, simple percentage method was used. The results shows that more than half of the respondents were females (54.3%) and rest were males (45.7%). All the respondents have English as their first language (100%). In terms of age, majority of respondents (67%) ranging between 23-27 years. About 22% students have their age between 18-22 years and 11% respondents are between 28-32 years. On the average majority of the respondent (71.5%) spend 6-10 hours on using computer for their educational purposes, 11% respondent use 1-5 hours on computer 9.5% respondent use less than 1 hours and 8% respondent use computer for more than 10 hours in a week for education. It has been also found that 56% respondents spend 6-10 hours per week online, while 28% spend 1-5 hours, 11% spend less than 1 hour while 5% spend more than 10 hours per week online. Also, it has been seen that more than half (57.1%) of the students are social-science graduate, 42.9% are science graduate.

TABLE: SHOWING ATTITUDE OF UNIVERSITY STUDENTS TOWARDS E-LEARNING

S.No.	Items	Mean Scores
1	Ease to access the Internet	4.02
2	Comfort in communicating	3.65
3	Willingly communicate with classmates electronically	3.85
4	Background and experience	4.11
5	Comfortable in written communication	3.71
6	Earlier course on e-learning is beneficial	3.65
7	Self-disciplined	4.14
8	Manage time effectively	3.74
9	Enjoy working independently	4.20
10	Enjoy working with students in groups	3.78
11	Like interaction with teaching assistants	4.45
12	Sufficient computer keyboarding skills	3.62
13	Comfortable in composing text on computer	3.25
14	Comfortable in communicating online	4.22
15	Ask questions and receive quick responses	4.00
16	Face-to-face interaction is necessary	3.74
17	Motivated by internet activities	4.20
18	Discuss with other students during internet activities	4.02
19	Work in groups during internet activities	4.11
20	Collaborate with other students during internet activities	3.95
21	Learning in class and home is same on internet	3.74
22	Practice English grammar on internet	3.60
23	Learning online is more motivating than regular class	3.42
24	Complete course on internet without difficulty	3.51
25	Pass course without teacher assistance	3.82
26	Online course is easy than learning English on internet	4.41

The mean scores of all the items are given above in the table indicate the attitude of the university students towards e-learning. It has been found that mean score of the item students like interaction with teaching assistants has maximum mean score 4.45, followed by online course is easy than learning English on internet (4.41), followed by comfortable in communicating online (4.22), enjoy working independently and motivated by internet activities (4.20), Self-disciplined (4.14), Background and experience and Work in groups during internet activities (4.11) and least in case of the students feel comfortable in composing text on computer in an online environment (3.25). Thus, from the above data it has been revealed that the students of the university of Jammu shows positive attitude toward e-learning as it has been found they are well acquaintance with the process of e-learning.

TABLE 2: SHOWING SUMMARY OF ANOVA: (2×2) FACTORIAL DESIGN

Sources of Variance	SS(Sum of Square)	df(Degree of freedom)	MS(Mean Square)	F-Ratio	Significance
A	28.01	1	28.04	0.41	Not Significant
B	20.41	1	20.41	0.30	Not Significant
A×B	0.03	1	0.03	0.00	Not Significant
Within	3776.4	56	67.43		

Df 1 at.05 is 4.02
Df 56 at 0.01 is 7.12

INTERPRETATIONS

The F- ratio for the main factor A ,(Gender) came out to be 0.41 and the table value for significance are 4.02 and 7.12 at .05 and .01 level of significance against df 1 and 56. Since the calculated value of F is less then table value at .05 and .01, it means there is no difference in the attitude of university students of different gender towards e-learning. Also, it had been seen that the F-ratio for factor B, Stream (Social Science and Pure Science) came out to be 0.30. The value of F for factor B is also less then table value at .05 and .01 level of significance. Hence, we can say that there is no difference in the attitude of university students of different gender and stream towards e-learning.

The F-ratio for Interaction (A×B) came out to be 0.00 which is less then the table value 4.02 and 7.12 against df 1 and 56 level of significance. The value of F for the Interaction is also not significant. It indicates that under joint influence of gender and different stream, there is no difference in the attitude of university students of different gender and stream towards e-learning.

CONCLUSION

Thus, it has been seen that the advent of Information and communication technology has its impact on all the diversified fields including education sector. The present study was an attempt to investigate the attitude of the students towards e-learning, which revealed that in the present context e-learning plays a crucial in the education sector. Also, it has been concluded that there is no difference in the attitude of university students of different gender towards e-learning. Thus, the process of e-learning has been seen as an important aspect as its demand is increasing. Hence, the endeavor was successfully done taking e-learning as an important aspect in the education sector.

SUGGESTIONS FOR FURTHER RESEARCH

Research is never ending process. The more on plunges in to it, the ocean of knowledge are open for him. Present investigation has lead to the discovery of some facts related with the attitude of university students towards e-learning. The present study was confined to the sample of 200 students of University of Jammu. Hence, it is suggested that some type of further investigation can be made with large sample. The study may be conducted by taking into account the variety of other independent variables. Also, the attitude of teachers towards the e-learning can be studied. It is suggested that other educational institutions can be taken for study also.

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ADVERTISING: DO THEY HELP CONSUMERS IN MAKING SOUND PURCHASE DECISIONS?

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ABSTRACT

A television commercial, wedge, ad or TV spot is a compact short-term visual used by advertising to convey their messages to an audience through the electronic medium known as television. This is a hugely popular advertising medium in India. A huge percentage of the Indian population religiously follows different kinds of TV programs, especially soap operas. Commercial breaks within the telecast periods of these TV shows are used for airing numerous TV advertisements which promote all kinds of products ranging from household stuffs to alcohol. Through TV, advertisers can reach out to a huge prospective consumer base that comprises of target customers belonging to a wide variety of group. In Indian advertising, the duration of a TV commercial is usually between 10 and 60 seconds (the most common formats are the 10, 20, 30 and 60 seconds slots). However, although uncommon, it is possible for a commercial to be of 5 or 6 seconds or even go up to 2 minutes. Currently there are promotional advertisements lasting longer than five minutes and whose structure resembles that of a segmented television program and cut blocks, which are called infomercials. These are complex constructions where programmatic drivers, experts, witnesses use products and even the public is present at the time of taping.

KEYWORDS
Advertising, Marketing.

THE IMPACT OF TV ADS ON CONSUMERS TODAY

The impact of basic formats for television commercials in India are mentioned here:
Testimonial- a satisfied user speaks about the effectiveness of a product. Usually this is more effective when the individual is unaware of being filmed. In these cases, the airing of the commercial must always be authorized by the individual. People always like to buy products that are promoted by any person living. These ads are more effective than any glamorous advertisements because of the involvements of real person in the advertisements. There are many such advertisements in India like the advertisements of Scrotch Bite. In this advertisement, a woman goes to meet some women in their house and ask them about the feedback of the product. The product is quite successful in the market.
Proof- This is another popular type of advertisements in India. The product is shown in the advertisement in competition with others. The audience can view the performance of any particular band or an individual in this type of advertisement. A musical ad conveys the entire message through the music and even sometimes is sung in its entirety (as in some jingles). This type of advertisement is meant to achieve much better results than the average ad. It can cause a terrible discomfort to the audience. For example, the advertisement of Kingfisher beer has become very famous and it is very catchy. It jingle 'Ooh Lala La' is a hit with the crowds and represents the brand. People loved the ad very much and this has made the product famous.
Troubleshooting snapshots of life- It reflects real life situations by actors representing ordinary people (drama). They always offer a solution to any personal problem. In order to make it effective It requires professional talent (good actors) to achieve credibility. There are some hair treatment shampoo or conditioners advertisements in India which are done by professional talents such as the ad of Head and Shoulders advertisement which is a quite popular shampoo in India. Lifestyle presents them to a user and their way of life rather than the product. The aim is to achieve identification with the character of the commercial or arousing the aspiration to that lifestyle. A lot of people suffer from hair loss and other hair related problems. This form of advertising provides a solution to the personal problems of people and hence, makes the customers identify with the respective product at a personal level. The performances of the actors are generally convincing enough to make the audiences feel that the character in the commercial is facing the same problem as him or her, and is suffering the same manner (Martinez, 2008).
Animation- These are very effective in communicating difficult messages and they may reach niche markets such as children. There are some advertisements in India which consists of cartoon characters like Boomer chewing gum. Children are very much interested in cartoon characters in India and that's why such products are very famous here. They can relate to the cartoons and can connect to the products based on entertainment. There are numerous chewing gum and bubble gum brands available in the Indian market. However, none of these products can match products like Boomer and Big Babool in terms of sales. The reason behind this is that these products appeal to the target consumer base, the children, in a unique and fun way. As they can relate to the cartoons, whenever they go to a store to buy chewing gum, they are more inclined to choose Big Babool and Boomer rather than the other brands.

CHANGES IN BUYING PATTERNS OF DIFFERENT PRODUCTS DUE TO TELEVISIONS

Direct sales are influenced as per the impact of TV ads on consumers today. This is characterized by an informative speech in which an announcer, host or actor explains, presents and describes the characteristics of the product, its advantages, the type of promotion that is offered in the season, the duration of the promotion, prices and an incentive to purchase immediately. Lux launched in the world beauty market in 1924 in United States of America. After that, it was expanded in several countries across the world. Lux became quite famous and successful in market because of their strong marketing strategies and they have another plus point which is they did not have any strong competitor who were able to compete with Lux. In almost all the countries TV stars and celebs have been seen in the advertisements of LUX products. In the year of 1943, Paramount movie star Paulette Goddard had been seen in a cardboard advertisement in LUX soap store. There are some famous bollywood stars also who brand ambassador of LUX in India are. The brand awareness of LUX moved from 23% to 93% among women because of the outdoor campaigning and TV advertisements. Purchase consideration among women has been almost doubled because of the TV advertisements. Direct consumer contact helped LUX to achieve a number of buyers. The direct sales strategies created brand awareness consolidate brand loyalty which resulted in increasing sales.
Television advertising has influenced the buying patterns of the Indian consumers in big way. The changes can be noted in different categories. Commercial Testimonials call for the intervention of a customer who witnessed the effectiveness of the product. Companies can use the same users who represent ordinary customers of the community (a homemaker, etc.) or a specialized user (an expert in the area covered by the producer like a doctor, a psychologist, a lawyer, and dentist. Also a celebrity or sports spectacle can recommend the use of a product. Celebrity endorsements have a huge impact on the minds of the consumers (Salgado, 2004). This is especially true in a country like India, where movie stars and sports personalities are even worshipped. Commercial testimonials have changed the buying patterns of the Indian consumers in a big way. For example, Dabur Chawan Prash used to be a very popular product. But, another company launched a different brand of Chawan Prash called Sona Chandi. Celebrities like Sourav Ganguly and M.S. Dhoni endorsed this product and in no time, Sona Chandi had a huge market in India.
Dramatized Commercial is highly effective. In this type of commercial fiction and action are presented through performances in dramatized situations where the product is produced in at least three types of events: using a circumstance associated with its use associated with an anecdote, its use associated with a short story in which a conflict is present and lastly, a solution to it. The use of fiction is an excellent way to hook consumers. This is mainly done due to the entertainment quotient. In this type of ads, the concept is treated as a short film, not just as a direct promotional campaign. The story is very important in this case. Pepsi has used these kinds of commercials in India ever since its launch and has met with tremendous success. The format followed by Pepsi included

different parts of a commercial being put on air after maintaining a certain time gap. The effect was that of a serialized or episode based TV fiction program. For example, one such commercial featured Shah Rukh Khan posing as Sachin in order to get Pepsi. The campaign was aired during the Cricket world cup and was initiated with a teaser and ended with the full story. Consumers are entertained by these ads and hence choose to buy the products. Earlier, Coca Cola had monopoly in India, but with the help of these commercials, Pepsi changed the buying patterns of people and generated a huge market for itself.

Humorous Commercial is used to associate the product with a moment of laughter that can be using two types of comedy: the situation comedy or physical comedy. The gag comedy and sketch may be present for the announcement and makes it attractive. Commercial to music is done with a structure where the product is accompanied by at least one of three forms of music, choreography or dance, sung dialogue and use of the jingle. Business Education type of commercial advertisement is not mentioned in Hilliard's latest edition of his book Screenwriting for Radio, Television and New Media, published in 2000, but in the sixties, in his first compilation on Television and its techniques, he defined it as the kind of trade where it is intended to give a teaching on the product in relation to its use, how and that it is made, how it works in your application. In many of the infomercials in India, the educational commercial structure is present. These are presented by drivers or experts who show us how a sofa bed can have various forms of application, etc. The effectiveness of different skin creams like Olay certain are supported by expert testimonials and guidance which vouches for authenticity. In short, these commercials are trying to educate the customer about the characteristics of identity construction and application of the advertised product (Arens, 2000).

DO TELEVISION ADS MAKE CONSUMERS TAKE SOUND PURCHASE DECISIONS?

Television ads make consumers take sound purchase decisions. Customers come to know about the effectiveness of different products through the advertisements. People can view numerous similar kinds of products through television advertisements and they can be familiar with the products. People can compare the products and make wise decisions. In some advertisements, customers come to know about the price of producats as well which can help them to decide what company they can choose from the numerous company available in market according to their budget. Television advertisements also help to know the features of some products like electronic products and the difference with some other products of different company. Most of the electronic products show the selling point in the advertisements. All these things help consumers make sound decisions to purchase products.

CONCLUSION

Television advertisements are quite helpful today to attract new customers and to keep their existing customers. The companies in India can make huge profit through the television advertisements. In India, people trust the advertisements a lot and they always wish to products depending on the advertisements. They can make comparisons of different products and they can choose the best one through the advertisement. People are attracted to the glamorous advertisements in India and that's why the companies show various celebrities in the advertisements to attract customers to buy their products.

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