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HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

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APPENDIX/ANNEXURE

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HUMAN RESOURCE MANAGEMENT PRACTICES IN HOSPITALS

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ABSTRACT

Human beings make a society. Healthy human beings make a healthy society. Every one believes that 'Health is wealth'. They are as much a part of society as the healthiest of individuals. Human resources, pertaining to health care comprise different kinds of clinical and non-clinical staff responsible for public and individual health intervention. The need for significant changes in behavior and attitude of health manpower and favorable Human resource management practices is widely recognized in both developed as well as developing countries. Since Independence India has achieved remarkable progress in social, political and economic fields. After the liberalization this progress has given further fillip, and has been recognized by the advance countries. In the area of Human resources management practice too, commendable progress has been made during this competition period. Hence, the need for better planning, organizing, staffing, coordinating, and controlling hospitals can hardly be over emphasized. Human resource management practices are essential for delivering effective healthcare services in hospitals. To maximize the usage of available Human Resources, an effective and prudent Human Resources management policy is essential. Human resource management practices refer to organizational activities directed at managing the pool of human resources and ensuring that the resources are employed towards the fulfillment of organizational goals. The purpose of this paper is to develop an Understanding of Human resource management Practices and to examine the unique Human resource management Practices implemented by different Hospitals.

KEYWORDS

Human resource management, Human resource management practices, Healthcare; Hospitals, Health care administration, Healthy society, Human resources management policy.

INTRODUCTION

Human resource management refers to the policies and practices one needs to carry out the people or human resource aspects of management position including recruiting, screening, training, rewarding and appraising.

Gary Dessler

Over the year, the important of human factor in the accomplishment of Human resources management practices in hospitals has increase considerably because of increasing competition and globalization of management in hospital side, so there is growing awareness on the part of the academicians and the professional managers to review management as a process concerned basically with the management of people because a tremendous overhaul is under way on the Human management front.

Human resources Management is concerned with the management of people at work .It refers a new philosophy, a new approach and new outlook. The human factor plays such an important role in the field of management and management as one and the same thing.

According to G.R. Agrawal:-

"Human resource management is a process concerned with the management of human energies and competencies for achieving organizational goals through acquisition, development, utilization and maintenance of a competent and committed workforce in a changing environment."

Human resource management regards people as the most important resource of an organization. It's all policies and practices are oriented towards improving human resources' performance, which directly contribute to the achievement of organizational goals. The study of Human resource management practices and activities gives the extent of success or failures of policies and practices. Research of human resource management provides an understanding of practices, policies that are successful and those which are not, what changes are necessary and in what area of personal management. Management needs information on employee job satisfaction in order to make sound decisions, both in preventing and solving employee problems.

Job satisfaction is a complex and important concept for Human Resource Managers to understand most employees do not believe their work is being properly rewarded. Nor do they believe that their companies are doing enough to attract high quality performers, train them, or manage them effectively. In fact no organization can successfully achieve its goal and mission unless and until those who constitute the organization are satisfied in their jobs. Hospitals are the key element in any health care system. Health care is a service every person needs sooner or later. The health care industry is significantly different from its manufacturing counterparts. For example, the health care industry is not assembly line oriented and as such has many more barriers to the successful implementation of customer delightment. The hospital administration's key challenge is the fact that doctors and nurses are not employee of hospitals; instead, they are customers of the administration process. Being centers of specialized medicine and technology, with large multidisciplinary teams, these institutions deliver a whole range of specialized services. Many hospitals also have a role to play in biomedical research, and in teaching and training of health professionals. Moreover, hospitals have a key role in health promotion, environmental concern, social human resources, and the creation of patient oriented service and management.

Human resource management practice directly or indirectly affects several other variables in the organization. The following some of practices have been mostly identified in the Hospitas:

Today human resources occupy, more than ever, the center stage of all economic activities. It is alarming time for all those organizations that wish to be successful in global markets to gear up and implement desired shift in their prevailing human resource management practices and leverage their human resources along with the other resources. Also to become more flexible and innovative organizations need to adopt new ways of attracting, retaining and motivating employees who are keen to learn and can contribute to the growth and development of the organization. If we Observed profile of Managers in general and Indian Managers in particular make an interesting topic for studies have been conducted on personality biosocial makeup , hopes and aspirations, attitudes and effectiveness of managers. These studies have covered a wide range of managerial personnel.

The term manager is a wide one. Most people are managers in a general sense. Anyone trying to achieve a goal through the efforts of others is a manager. In this sense, parents, teachers, preachers and politicians could be called managers. We are however concerned with those whose primary task it is to ensure the smooth and efficient functioning of organizations designed to provide services or goods. They have a variety of designations such as executives, mangers is defined as one holding a management position in the organization.

MANAGER'S JOB IN HOSPITAL SIDE

It is difficult to list the functions of a manager. From the planning of a particular activity to its execution, there are innumerable functions and the manager is involved with each of them in varying degrees. In general, the major function of manager is to make viable decisions. Decisions are heartbeats of an organization. Since the common purpose of all management decision is to bring about the integration of organization membership, organizationally defined missions should be the starting point of organization –related decisions.

MANAGERS EFFECTIVENESS

The effective manager is one who is properly developed in terms of basic intellectual abilities and the predisposition necessary for carrying out the task smoothly. Several attempts have been made to identify the characteristics of effective managers. Such attempts have usually looked at the specific biosocial variables, personality predispositions and skills of successful and unsuccessful managers, and identified areas that make him successful or otherwise. Most studies have identified the following skills and characteristics among effective managers:

EMPLOYEE CENTEREDNESS

Several researches on the attitude of managers towards employees have shown that open understanding, responsive and considerate behaviors on the part of the manager have contributed to his success. After all, the implementation of management's decision depends on its subordinates and if proper attention is not paid to their feelings, like and dislike and hopes and aspirations, it might be reflected in the output as well as in the dissatisfaction of the employees. It should be pointed out here that over consideration of their feelings might be equally bad. The major task of the organization is to fulfill its goals of production and profit. This cannot be overemphasized. However, the goals could be achieved much more meaningfully if the employees are treated as human beings and not as shift workers.

ADAPTABILITY

A manger can be totally resistant to change or he can flexible enough to learn to live with almost any kind of change thrust at him. Though to some degree, maintaining the status quo might be useful, it pays to be adaptable to the changing environment of business. In India where the success of an enterprise depends so much on the sociopolitical climate and economic factors, flexibility is of great importance. A successful manager makes extra attempts not to have rigid attitudes and point of views. He tries to retain his sense of balance when faced with a flexible changing environment.

PARITY IN TREATMENT

It is extremely necessary for a manger to be uniform in his attitude, behavior and sanctions to his subordinates and others. Parity in treatment reflects his objectivity and concern for social justice. Differential distribution of rewards and penalties with insufficient reason has been found to be a major cause in creating problems of morale, motivation, absenteeism and turnover

CONCEPTUAL SKILLS

A manager's job is also one of planning and forecasting. It requires conceptual skills, an ability to visualize, assimilate and evaluate information and take in to account the repercussion of the decisions on the larger issues. With insufficient conceptual skill he may not be able to discern problems; devise solutions, analyze data and exercise judgment. Recruitment of conceptual skill must vary according to the level of management. Competence in conceptual skills leads to excellence in decision making.

COMMUNICATION ABILITY

The ability to communicate is also very important for a successful manager. Regardless of their positioning in the organizational structure, managers must be able to define an idea or issue clearly, translate it in to usable language, and disseminate it to his subordinates and peers in a language understandable to them. Since a manager's job depends on how well his plans are implemented on the shop floor, his ability to communicate them clearly becomes very critical.

TECHNICAL SKILLS

Although the degree of technical skill required might vary according to the level, some amount of it is necessary for all managers. Although some claim that the job of a manger is to manage, and mere technical skill may not constitute the ability to manage, it is still necessary for a manager to have some technical knowledge of finance, marketing, production, personnel and other functional areas.

TYPES OF HUMAN RESOURCES MANAGEMENT PRACTICES

Over the years, researchers have suggested many Human resource management practices that have the potential to improve and sustain organizational performance. These practices include emphasis on employee selection based on fit with the company's culture, emphasis on behavior, attitude, and necessary technical skills required by the job, compensation contingent on performance, and employee empowerment to foster team work, among others. Pfeffer (1998) has proposed seven Human resource management practices that are expected to enhance organizational performance. The practices proposed by Pfeffer (1998, p. 96) are:

1. Employment security.
2. Selective hiring of new personnel.
3. Self-managed teams and decentralization of decision-making as the basic principles of organizational design.
4. Comparatively high compensation contingent on organizational performance.
5. Extensive training.
6. Reduced status distinctions and barriers, including dress, language, office arrangements, and wage differences across levels.
7. Extensive sharing of financial and performance information throughout the organization.

CONCLUSION

Proper management of human resources is critical in providing a high quality of health care. A refocus on human resources management in health care and more research are needed to develop new policies. Effective human resources management strategies are greatly needed to achieve better outcomes from and access to health care around the world. Without human resources, no organization can achieve its goals. Among all the resources in organization, human resource is the most important. It regards to the management of human resource in organizations. It consists of different processes and policies which make the human resource satisfied and motivated to their works. It is Human resource management that brings great success to the organization.

Since its primitive beginnings, human resource management has been successful to attract the managers. Interest in HRM is continuously rising, due to the various reasons. In conclusion, causes of the rising interest in HRM can be listed as:-

1. Managing human resources is one of the key elements in the co-ordination and management of work.
2. HRM is different from the traditional practice of personnel management.
3. HRM represents a wider conception of the employment relationship to incorporate on enabling and developmental role for individual employee.
4. HRM can be viewed as the part of strategic managerial function in the development of business policy.

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INVENTORY MODELS FOR DETERIORATING ITEMS WITH STOCK DEPENDENT PRODUCTION AND DEMAND RATES HAVING WEIBULL DECAY

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ABSTRACT

In this paper we develop and analyze an inventory model for deteriorating items with the assumption that both production and demand rates are dependent on stock on-hand. It is further assumed that lifetime of the commodity is random and follows a three parameter Weibull distribution. Using the differential equations the instantaneous state of inventory is derived. With suitable cost considerations the total cost function is obtained. By minimizing the total cost function the optimal ordering policies are derived. Through numerical illustrations the sensitivity analysis is carried. It is observed that the stock dependent production parameters and the deterioration distribution parameters have significant influence on optimal production scheduling and total cost. This model also includes some of the earlier models as particular cases for specific values of the parameters. This model is much useful in analyzing several production processes.

KEYWORDS

EPQ model, stock dependent production, stock dependent demand, Weibull decay, production schedule.

1. INTRODUCTION

Inventory models are mathematical models which help a business firm to make optimal decisions as when and how much to buy (or produce) so as to minimize its cost or maximize its profit. Since the first classical lot-size formula was developed by F.W. Harris in 1915, a wide variety of inventory models have been developed and analyzed with various assumptions to deal with the real life situations. The efficiency of an inventory model depends upon the suitable assumptions made on the constituent components of the mode. The constituent components of the model are (1) replenishment (2) demand pattern and (3) lifetime of the commodity.

The implicit assumption of the Economic Order Quantity (EOQ) model is that the items are obtained from the outside supplier. Given this assumption, it is reasonable to assume that the entire lot is delivered at an instant of time. This means it is assumed that the replenishment rate is infinite. However, in some other places like production processes, manufacturing units, warehouses, the replenishment (production) is not instantaneous and may have finite rate. In the study of inventory models, economical production quantity (EPQ) model plays an important role. An EPQ model is an inventory model that determines the quantity of product to be produced on a single facility so as to meet the demand over an infinite planning horizon. The two most important decision variables in any EPQ model are the production run time and the optimal quantity to be produced. Production inventory models serve to find the optimal values of these decision variables while minimizing the total cost of production.

Acting as the driving force of the whole inventory system, demand is a key factor that should be taken into consideration in studying inventory systems. The demand for an item may be deterministic or stochastic. Demand may further be assumed to be constant over time, or variable depending on time, selling price of the item, amount of stock on hand, quality of the product or any other factors.

Decay or deterioration of physical goods while in stock is a common phenomenon. Pharmaceuticals, foods, vegetables and fruits are a few examples of such items. Taking this into consideration, deteriorating inventory models have been widely studied in recent years. Ghare and Schrader (1963) developed an economic order quantity model with constant rate of decay. Covert and Philip (1973) extended this model and obtained an economic order quantity model for a variable rate of deterioration by assuming a two-parameter Weibull distribution. Comprehensive reviews of research literature on deteriorating items are provided by Raafat (1991), Goyal and Giri (2001), Li, *et al*. (2010), Pentico and Drake (2011) and Bakker, *et al.* (2012).

In classical inventory models the demand rate is assumed to be constant. In reality, it may vary with time or with price or with the instantaneous level of inventory displayed in a supermarket. Manna, *et al.* (2007), Patra (2010), Teng, *et al.* (2011) studied economic order quantity models for deteriorating items when demand is quadratic in time. Skouri, *et al.* (2009) developed an order level inventory model with general ramp type demand rate, Weibull deterioration rate and partial backlogging of unsatisfied demand where the backlogging rate is any non-increasing function of the waiting time up to the next replenishment. Panda, *et al.* (2009), Panda and Saha (2010) and Manna and Chiang (2010) studied production inventory models having time-dependent demand and finite rate of production which is proportional to the demand rate.

It has been observed that for certain types of inventories, particularly consumer goods, heaps of stock will attract customers and the demand is a function of stock on-hand. Due to this fact, this area of inventory theory research has recently been receiving considerable attention. Mandal and Phaujdar (1989),Urban (1992), Giri *et al.* (1996), Zhou and Yang (2003), Teng *et al.* (2005), Uma Maheswara Rao, *et al* (2010), Yang, *et al.* (2010a) and others have developed inventory models where demand rate is a function of on-hand inventory.

In some production units dealing with food processing demand is a function of selling price. Maiti, *et al.* (2009) and Sana (2011) developed a finite time-horizon deterministic EOQ model where the rate of demand decreases quadratically with selling price. Widyadana and Wee (2012) developed an EPQ model for deteriorating items with rework. Production, rework, deteriorating and demand rates are assumed constant. Srinivasa Rao, *et. al* (2011) developed a production inventory system with demand rate a function of production quantity.

Inventory models for deteriorating items having multivariate demand functions were also studied by several authors. Chang, *et al.* (2010), Khanra, *et al.* (2010) considered selling price and stock level dependent demand rate and Uma Maheswara Rao, *et al.* (2010b) considered time and stock level dependent demand rate. Shah and Pandey (2009) developed a model for deteriorating items where demand is a function of frequency of advertisement and displayed inventory level by assuming infinite replenishment rate and Weibull rate of deterioration. Pal *et al.* (2006) considered a single deteriorating item with the demand rate dependent on displayed stock level, selling price of an item and frequency of advertisement.

But these authors have considered that the replenishment is instantaneous or have a fixed finite rate. Bhunia and Maiti (1998) developed inventory model without shortages for non deteriorating items by assuming production rate is linearly dependent on on-hand inventory and demand rate on time. An inventory

model with fuzzy replenishment where demand rate is taken as a ramp type function of time was considered by Mahta and Goswami (2009). Sridevi *et al.* (2010) developed an inventory model for deteriorating items with random replenishment. Muluneh and Srinivasa Rao (2012) developed an inventory with the assumption that the production rate is dependent on stock on hand and demand is a power function of time. Recently, Muluneh and Srinivasa Rao (2013) developed an inventory model for deteriorating items with stock dependent production rate selling price dependent demand.

In this paper an inventory model for deteriorating items is developed with the assumption that both the replenishment and demand are functions of on-hand inventory. It is also assumed that the lifetime of the commodity is random and follows a three parameter Weibull distribution. The three parameter Weibull decay includes increasing/decreasing/ constant rates of decay. It also includes exponential decay as a particular case. The location parameter in the decay distribution characterizes the delayed decay of deteriorating items. The demand function considered here also includes the constant demand as a particular case. Assuming that shortages are allowed and fully backlogged, the instantaneous state of inventory is derived through differential equations. Production schedule and production quantity are derived by minimizing the total cost function. The sensitivity of the model with respect to the parameters and cost is also studied. This model is extended to the case of without shortages.

2. NOTATIONS AND ASSUMPTIONS

2.1. NOTATIONS

The following notations are used in developing the model.

$I(t)$	inventory level at any time t
A	set up cost
c_2	shortage cost per unit per unit time
h	inventory holding cost per unit per unit time
H	total holding cost in a cycle time
p	per unit production cost (cost price) of the item
S_h	total shortage cost in a cycle time
$D(t)$	Rate of demand at any time t
$R(t)$	rate of production at any time t
Q	production quantity
T	production cycle time
TC	total production cost per unit time
(α, β, γ)	deterioration rate parameters
(τ, ϕ)	demand rate parameters
(ϕ, θ)	production rate parameters

2.2. ASSUMPTIONS

The model is developed based on the following assumptions.

i. Lifetime of the commodity is random and follows a three parameter Weibull distribution with probability density function of the form

$$f(t) = \alpha\beta(t-\gamma)^{\beta-1}e^{-\alpha(t-\gamma)^{\beta}}, \quad \alpha, \beta > 0, \ t \geq \gamma$$

where, α is scale parameter, β is shape parameter and γ is location parameter.

The instantaneous rate of deterioration at time t is

$$h(t) = \frac{f(t)}{1-F(t)} = \alpha\beta(t-\gamma)^{\beta-1}$$

ii. The demand rate function $D(t)$ is a known function of instantaneous stock level, $I(t)$. Its functional form is given by

$$D(t) = \begin{cases} \tau + \varphi I(t), & 0 \leq t \leq t_2 \\ \tau, & t_2 \leq t \leq T \end{cases}$$

where, τ is a positive constant and φ is the stock-dependent consumption rate parameter, $0 \leq \varphi \leq 1$. If $\varphi = 0$, then the demand rate is constant.

iii. Production rate is assumed to be finite and a decreasing linear function of the instantaneous stock level inventory level, $I(t)$, i.e.,

$$R(t) = \begin{cases} \theta - \phi I(t), & 0 \leq t \leq t_2 \\ \theta, & t_2 \leq t \leq T \end{cases}$$

where, $\theta \geq 0$, φ is the stock-dependent production rate parameter, $0 \leq \phi \leq 1$ and it is assumed that $R(t) \geq D(t)$ at any time where replenishment takes place.

If ϕ=0, then it includes the finite rate of production.

iv. There is no repair or replacement of deteriorated items.

v. The planning horizon is infinite. Each cycle will have length T.

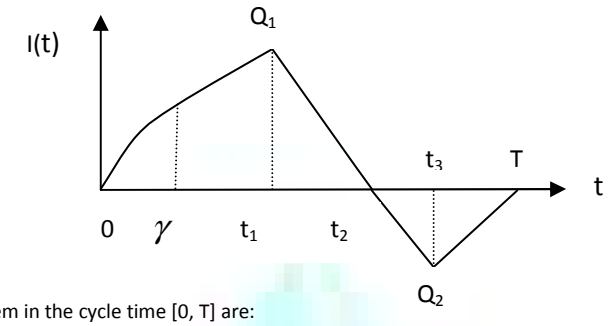
vi. The inventory holding cost per unit per unit time h, the shortage cost per unit per unit time c_2 and the unit production cost per unit time p and set up cost A per cycle are fixed and known,

3. INVENTORY MODEL WITH SHORTAGES

3.1. MODEL FORMULATION

Consider an inventory system for deteriorating items in which the lifetime of the commodity is random and follows a three parameter Weibull distribution. Here it is assumed that shortages are allowed and fully backlogged. In this model the stock level for the item is initially zero. Then production starts at time $t=0$, and continues adding items to stock until the on-hand inventory reaches its maximum level Q_1 at time $t=t_1$. During the time $(0, \gamma)$ demand is met from replenishment and the remaining will be accumulated in stock. At time $t = \gamma$ deterioration of the item starts and stock is depleted by demand and deterioration while production is continuously adding to it. At $t=t_1$ production is stopped and stock will be depleted by deterioration and demand until it reaches zero at time $t=t_2$. As demand is assumed to occur continuously, at this point shortages begin to accumulate until it reaches its maximum level of Q_2 at $t=t_3$. At this point production will resume meeting the current demand and clearing the backlog. Finally shortages will be cleared at time $t=T$. Then the cycle will be repeated indefinitely. The schematic diagram representing the inventory system is shown in Fig. 1

FIG. 1: SCHEMATIC DIAGRAM REPRESENTING THE INVENTORY LEVEL OF THE SYSTEM



The differential equations governing the system in the cycle time [0, T] are:

$$\frac{dI(t)}{dt} = \{\theta - \phi I(t)\} - \{\tau + \varphi I(t)\},\ 0 \le t \le \gamma \tag{1}$$

$$\frac{dI(t)}{dt} = \{\theta - \phi I(t)\} - \{\alpha\beta(t-\gamma)^{\beta-1} I(t)\} - \{\tau + \varphi I(t)\},\ \gamma \le t \le t_1 \tag{2}$$

$$\frac{dI(t)}{dt} = -\{\alpha\beta(t-\gamma)^{\beta-1} I(t)\} - \{\tau + \varphi I(t)\},\ t_1 \le t \le t_2 \tag{3}$$

$$\frac{dI(t)}{dt} = -\tau,\ t_2 \le t \le t_3 \tag{4}$$

$$\frac{dI(t)}{dt} = \theta - \tau,\ t_3 \le t \le T \tag{5}$$

with boundary conditions,

$$I(0) = 0,\ I(t_2) = 0,\quad I(T) = 0$$

Solving the differential equations (1) to (5) the on-hand inventories at time *t* are respectively.

$$\mathrm{I}(t) = \frac{(\theta - \tau)}{\phi + \varphi}(1 - e^{-(\phi+\varphi)t}),\quad 0 \le t \le \gamma \tag{6}$$

$$\mathrm{I}(t) = (\theta - \tau)e^{-\{(\phi+\varphi)t + \alpha(t-\gamma)^{\beta}\}}\left\{\int_{\gamma}^{t} e^{(\phi+\varphi)u + \alpha(u-\gamma)^{\beta}}\,du + \frac{\left(e^{(\phi+\varphi)\gamma} - 1\right)}{\phi + \varphi}\right\},\ \gamma \le t \le t_1 \tag{7}$$

$$I(t) = \tau e^{-\varphi t - \alpha(t-\gamma)^{\beta}} \int_{t}^{t_2} e^{\varphi u + \alpha(u-\gamma)^{\beta}}\,du,\ t_1 \le t \le t_2 \tag{8}$$

$$I(t) = -\tau(t - t_2),\ t_2 \le t \le t_3 \tag{9}$$

$$\mathrm{I}(t) = -(\theta - \tau)(T - t),\quad t_3 \le t \le T \tag{10}$$

Since *I(t)* is continuous at t_1 evaluating equations (7) and (8) at $t=t_1$ and equating we get,

$$(\theta - \tau)e^{-\{(\phi+\varphi)t_1 + \alpha(t_1-\gamma)^{\beta}\}}\left\{\int_{\gamma}^{t_1} e^{\{(\phi+\varphi)u + \alpha(u-\gamma)^{\beta}\}}du + \frac{\left(e^{(\phi+\varphi)\gamma} - 1\right)}{\phi + \varphi}\right\} = \tau e^{-\varphi t - \alpha(t_1-\gamma)^{\beta}} \int_{t_1}^{t_2} e^{\varphi u + \alpha(u-\gamma)^{\beta}}\,du \tag{11}$$

This equality is used to establish the relationship between t_1 and t_2. Either side of equation (11) can be used as the value of the maximum inventory level, Q_1. Using Taylor's series expansion of the exponential function, ignoring terms of higher order and integrating we get,

$$Q_1 = \tau e^{-\varphi t_1 - \alpha(t_1-\gamma)^{\beta}}\left\{t_2 + \frac{1}{2}\varphi t_2^{\,2} + \frac{\alpha(t_2-\gamma)^{\beta+1}}{(\beta+1)} - t_1 - \frac{1}{2}\varphi t_1^{\,2} - \frac{\alpha(t_1-\gamma)^{\beta+1}}{(\beta+1)}\right\} \tag{12}$$

Similarly, since I(t) is continuous at t_3, evaluating equations (9) and (10) at $t=t_3$ and equating we get;

$$\tau(t_3 - t_2) = (\theta - \tau)(T - t_3) \tag{13}$$

Therefore we have

$$t_3 = T - \frac{\tau(T - t_2)}{\theta} \tag{14}$$

Either side of equation (13) can be used as the value of the maximum shortage level, Q_2. Therefore,

$$Q_2 = -\frac{\tau}{\theta}(\theta - \tau)(T - t_2) \tag{15}$$

Backlogged demand is

$$B(t) = \int_{t_2}^{t_3} D(t)dt = \int_{t_2}^{t_3} (\tau - \varphi I(t))\, dt$$

$$= \tau(t_3 - t_2) - \frac{\varphi\tau}{2}(t_3 - t_2)^2 \tag{16}$$

Stock loss due to deterioration at any time t is

$$L(t) = \int_0^t R(t)dt - \int_0^t D(t)dt - I(t)$$

$$L(t) = \begin{cases} (\theta - \tau)t - (\phi + \varphi)\left\{\int_0^{\gamma} I(t)\,dt + \int_{\gamma}^{t} I(t)\,dt\right\} - I(t), & \gamma \le t \le t_1 \\ (\theta - \tau)t_1 - (\phi + \varphi)\left\{\int_0^{\gamma} I(t)\,dt + \int_{\gamma}^{t_1} I(t)\,dt\right\} - \tau(t - t_1) & \\ \quad -\varphi\int_{t_1}^{t} I(t)\,dt - I(t), \qquad t_1 \le t \le t_2 & \\ 0, \qquad else\ where & \end{cases} \tag{17}$$

where $I(t)$ is as defined in equations (6) and (7).

Production quantity in the cycle time $(0, T)$ is

$$Q = \int_0^{\gamma} R(t)dt + \int_{\gamma}^{t_1} R(t)dt + \int_{t_3}^{T} R(t)dt$$

$$= \theta(t_1 + T - t_3) - \int_0^{\gamma} \phi I(t)\,dt - \int_{\gamma}^{t_1} \phi I(t)\,dt \tag{18}$$

Substituting $I(t)$ in equation (18) by the expressions in equations (6) and (7), using Taylor's series expansion of the exponential function, ignoring terms of higher order and integrating we get

$$Q = \theta t_1 + \tau(T - t_2) - \frac{\phi(\theta - \tau)}{(\phi + \varphi)^2}\left\{(\phi + \varphi)\gamma + e^{-(\phi+\varphi)\gamma} - 1\right\}$$

$$-\phi(\theta - \tau)\left\{\mathrm{B}t_1 + \frac{1}{2}t_1^{\,2}(1 - (\phi + \varphi)B) - \frac{1}{6}(\phi + \varphi)t_1^{\,3} - \frac{1}{8}(\phi + \varphi)^2 t_1^{\,4}\right.$$

$$+\frac{2\alpha(t_1 - \gamma)^{\beta+2}}{(\beta+1)(\beta+2)} - \frac{\alpha(t_1 - \gamma)^{\beta+1}}{\beta+1}\left(B + t_1 + \frac{1}{2}(\phi + \varphi)t_1^{\,2}\right) - \frac{\alpha^2(t_1 - \gamma)^{2(\beta+1)}}{2(\beta+1)^2} - B\gamma$$

$$\left.-\frac{1}{2}\gamma^2(1 - (\phi + \varphi)B) + \frac{1}{6}(\phi + \varphi)\gamma^3 + \frac{1}{8}(\phi + \varphi)^2\gamma^4\right\} \tag{19}$$

where,

$$\mathrm{B} = \frac{1}{\phi + \varphi}\left\{e^{(\phi+\varphi)\gamma} - 1\right\} - \frac{1}{2}(\phi + \varphi)\gamma^2 - \gamma \tag{20}$$

The total cost per unit time of the system, $TC = TC(t_1, t_2)$, is the sum of setup cost per unit time, the production cost per unit time, inventory holding cost per unit time and the shortage cost per unit time, i.e.

$$TC(t_1,t_2)=\frac{A}{T}+\frac{pQ}{T}+\frac{h}{T}\left\{\int_0^{\gamma}I(t)\,dt+\int_{\gamma}^{t_1}I(t)\,dt+\int_{t_1}^{t_2}I(t)\,dt\right\}+\frac{c_2}{T}\left\{\int_{t_2}^{t_3}-I(t)\,dt+\int_{t_3}^{T}-I(t)\,dt\right\} \quad (21)$$

Substituting the expressions for I(t) from equations (6) to (10) in equation (21), using Taylor's series expansion of the exponential function, neglecting higher order terms and integrating we get,

$$TC=\frac{A}{T}+\frac{p\theta}{T}\left[t_1+\frac{\tau(T-t_2)}{\theta}\right]+\frac{h-p\phi}{T}\frac{(\theta-\tau)}{(\phi+\varphi)^2}\left\{(\phi+\varphi)\gamma+e^{-(\phi+\varphi)\gamma}-1\right\}$$

$$+\frac{(h-p\phi)}{T}(\theta-\tau)\left\{Bt_1+\frac{1}{2}t_1^{\,2}(1-(\phi+\varphi)B)-\frac{1}{6}(\phi+\varphi)t_1^{\,3}-\frac{1}{8}(\phi+\varphi)^2t_1^{\,4}\right.$$

$$+\frac{2\alpha(t_1-\gamma)^{\beta+2}}{(\beta+1)(\beta+2)}-\frac{\alpha(t_1-\gamma)^{\beta+1}}{\beta+1}\left(B+t_1+\frac{1}{2}(\phi+\varphi)t_1^{\,2}\right)-\frac{\alpha^2(t_1-\gamma)^{2(\beta+1)}}{2(\beta+1)^2}-B\gamma$$

$$\left.-\frac{1}{2}\gamma^2(1-(\phi+\varphi)B)+\frac{1}{6}(\phi+\varphi)\gamma^3+\frac{1}{8}(\phi+\varphi)^2\gamma^4\right\}$$

$$+\frac{\tau h}{T}\left\{\left[t_2+\frac{1}{2}\varphi t_2^{\,2}+\frac{\alpha}{(\beta+1)}(t_2-\gamma)^{\beta+1}\right]\left[(t_2-t_1)-\frac{\varphi}{2}(t_2^{\,2}-t_1^{\,2})-\frac{\alpha\{(t_2-\gamma)^{\beta+1}-(t_1-\gamma)^{\beta+1}\}}{(\beta+1)}\right]\right.$$

$$-\frac{(t_2^{\,2}-t_1^{\,2})}{2}+\frac{\varphi}{6}(t_2^{\,3}-t_1^{\,3})+\frac{\varphi^2}{8}(t_2^{\,4}-t_1^{\,4})+\frac{\alpha(t_2-\gamma)^{\beta+1}}{(\beta+1)}\left[t_2+\frac{1}{2}\varphi t_2^{\,2}\right]$$

$$\left.-\frac{\alpha(t_1-\gamma)^{\beta+1}}{(\beta+1)}\left[t_1+\frac{1}{2}\varphi t_1^{\,2}\right]-\frac{2\alpha\left[(t_2-\gamma)^{\beta+2}-(t_1-\gamma)^{\beta+2}\right]}{(\beta+1)(\beta+2)}+\frac{\alpha^2\left[(t_2-\gamma)^{2(\beta+1)}-(t_1-\gamma)^{2(\beta+1)}\right]}{2(\beta+1)^2}\right\}+\frac{c_2\tau}{2\theta T}(\theta-\tau)(T-t_2)^2 \quad (22)$$

3.2. OPTIMAL POLICIES OF THE MODEL

In this section, we obtain the optimal pricing and ordering policies of the inventory model developed in section (4.1). The total cost function is minimized to obtain the optimal production scheduling policies. To obtain these optimal values we differentiate *TC* in equation (22) with respect to t_1 and t_2 and equate the resulting equations to zero. And then the optimal values for the production up-time t_3, production quantity, *Q* and total cost, *TC* will be obtained using equations (14), (19) and (22) respectively.

The condition for the solutions to be optimal (minimum) is that the determinant of the Hessian matrix to be positive definite, i.e.

$$D=\begin{bmatrix}\frac{\partial^2 TC(t_1,t_2)}{\partial t_1^2} & \frac{\partial^2 TC(t_1,t_2)}{\partial t_1\partial t_2}\\ \frac{\partial^2 TC(t_1,t_2)}{\partial t_1\partial t_2} & \frac{\partial^2 TC(t_1,t_2)}{\partial t_2^2}\end{bmatrix}>0$$

Differentiating $TC(t_1,t_2)$ with respect to t_1 and equating to zero we get

$$\frac{p\theta}{T}+\frac{(h-p\phi)}{T}(\theta-\tau)\left\{B+(1-(\phi+\varphi)B)t_1-\frac{1}{2}(\phi+\varphi)t_1^{\,2}-\frac{1}{2}(\phi+\varphi)^2t_1^{\,3}\right.$$

$$\left.+\frac{\alpha(t_1-\gamma)^{\beta+1}}{\beta+1}(1-(\phi+\varphi)t_1)-\alpha(t_1-\gamma)^{\beta}\left(B+t_1+\frac{1}{2}(\phi+\varphi)t_1^{\,2}\right)-\frac{\alpha^2(t_1-\gamma)^{2\beta+1}}{(\beta+1)}\right\}$$

$$+\frac{\tau h}{T}\left\{\left[t_2+\frac{1}{2}\varphi t_2^{\,2}\frac{\alpha}{(\beta+1)}(t_2-\gamma)^{\beta+1}\right]\left[\alpha(t_1-\gamma)^{\beta}+\varphi t_1-1\right]+t_1-\frac{1}{2}\varphi t_1^{\,2}-\frac{1}{2}\varphi^2t_1^{\,3}\right.$$

$$\left.-\alpha(t_1-\gamma)^{\beta}\left(t_1+\frac{1}{2}\varphi t_1^{\,2}\right)+\frac{\alpha(t_1-\gamma)^{\beta+1}}{(\beta+1)}(1-\varphi t_1)+\frac{\alpha^2(t_1-\gamma)^{2\beta+1}}{(\beta+1)}\right\}=0 \quad (23)$$

Differentiating $TC(t_1,t_2)$ with respect to t_2 and equating to zero we get

$$-\frac{p\tau}{T}-\frac{\tau c_2}{\theta T}(\theta-\tau)(T-t_2)$$

$$+\frac{\tau h}{T}\left\{\left[1+\varphi t_2+\alpha(t_2-\gamma)^{\beta}\right]\left[(t_2-t_1)-\frac{\varphi}{2}(t_2^{\,2}-t_1^{\,2})-\frac{\alpha\{(t_2-\gamma)^{\beta+1}-(t_1-\gamma)^{\beta+1}\}}{(\beta+1)}\right]\right.$$

$$+\left[t_2+\frac{1}{2}\varphi t_2^{\,2}+\frac{\alpha\left(t_2-\gamma\right)^{\beta+1}}{(\beta+1)}\right]\left[1-\varphi t_2-\alpha\left(t_2-\gamma\right)^{\beta}\right]-t_2+\frac{1}{2}\varphi t_2^{\,2}+\frac{1}{2}\varphi^2 t_2^{\,3}$$

$$+\alpha\left(t_2-\gamma\right)^{\beta}\left(t_2+\frac{1}{2}\varphi t_2^{\,2}\right)+\frac{\alpha\left(t_2-\gamma\right)^{\beta+1}\left(\varphi t_2-1\right)}{(\beta+1)}+\frac{\alpha^2\left(t_2-\gamma\right)^{2\beta+1}}{\beta+1}\Bigg\}=0 \qquad (24)$$

The solutions t_1^* and t_2^* of t_1 and t_2 are obtained by solving the nonlinear equations (23) and (24) by using numerical methods.

3.3. NUMERICAL ILLUSTRATION

Consider the case of deriving an EPQ and other optimal policies for a food processing industry for *T=6*. Here the product is of a deteriorating type and has a random lifetime which is assumed to follow a three parameter Weibull distribution. Records and discussions held with the production and marketing personnel suggest the values of various parameters. The deterioration parameters (α, β, γ) are estimated to vary from (0.03, 1, 0.4) to (0.06, 4, 0.7), stock dependent demand parameters from (50, 0.04) to (65, 0.07) and stock dependent production parameters from (0.4, 100) to (0.7, 130). Let the values for other parameters be *p*=6, *h*=4, c_2=2 and *A*=75 all in appropriate units. Substituting these values into the equations (23) and (24) and solving by using numerical methods we obtain the optimal solutions t_1^* and t_3^*, Q^* and TC^* of t_1 and t_3, *Q* and TC respectively. The values of the parameters are varied to observe the trend in the optimal policies and the results are presented in table 1.

TABLE 1: OPTIMAL SOLUTIONS OF THE MODEL WITH SHORTAGES FOR DIFFERENT VALUES OF THE PARAMETERS

	ϕ	ϕ	Θ	α	β	γ	p	h	c_2	A	t_1*	t_3*	Q*	TC*
50	0.05	0.60	120	0.04	2	0.50	6.0	4.0	2.0	75	2.635	5.668	421.499	453.064
55											2.596	5.550	419.652	466.593
60											2.542	5.420	416.741	480.281
65											2.474	5.274	414.221	494.152
60	0.04	0.60	120	0.04	2	0.50	6.0	4.0	2.0	75	2.667	5.460	442.054	484.621
	0.05										2.542	5.420	416.741	480.281
	0.06										2.417	5.377	393.974	475.969
	0.07										2.292	5.332	373.494	471.719
60	0.05	0.40	120	0.04	2	0.50	6.0	4.0	2.0	75	2.495	5.370	359.247	494.700
		0.50									2.436	5.313	374.375	483.127
		0.60									2.542	5.420	416.741	480.281
		0.70									2.681	5.751	497.700	492.262
60	0.05	0.60	100	0.04	2	0.50	6.0	4.0	2.0	75	2.356	5.042	344.390	430.317
			110								2.468	5.260	379.706	455.179
			120								2.542	5.420	416.741	480.281
			130								2.592	5.540	454.294	505.568
60	0.05	0.60	120	0.03	2	0.50	6.0	4.0	2.0	75	2.94	5.567	514.328	490.143
				0.04							2.542	5.420	416.741	480.281
				0.05							2.224	5.274	363.450	472.381
				0.06							1.977	5.149	333.909	466.306
60	0.05	0.60	120	0.04	1	0.50	6.0	4.0	2.0	75	3.677	5.747	813.967	506.786
					2						2.542	5.420	416.741	480.281
					3						1.549	4.838	308.194	463.598
					4						1.182	4.580	297.041	461.485
60	0.05	0.60	120	0.04	2	0.40	6.0	4.0	2.0	75	2.454	5.389	400.295	477.370
						0.50					2.542	5.420	416.741	480.281
						0.60					2.628	5.448	434.232	483.108
						0.70					2.711	5.474	452.409	485.839
60	0.05	0.60	120	0.04	2	0.50	5.0	4.0	2.0	75	2.143	4.982	380.975	413.471
							6.0				2.542	5.420	416.741	480.281
							7.0				2.522	5.764	370.295	546.873
							8.0				2.343	5.908	310.488	603.362
60	0.05	0.60	120	0.04	2	0.50	6.0	3.5	2.0	75	2.531	5.723	377.529	472.449
								4.0			2.542	5.420	416.741	480.281
								4.5			2.339	5.120	404.109	485.850
								5.0			2.161	4.924	391.322	492.145
60	0.05	0.60	120	0.04	2	0.50	6.0	4.0	1.0	75	2.679	5.471	448.429	477.215
									2.0		2.542	5.420	416.741	480.281
									3.0		2.358	5.348	381.010	484.059
									4.0		2.067	5.231	337.377	489.038
60	0.05	0.60	120	0.04	2	0.50	6.0	4.0	2.0	50	2.542	5.420	416.741	476.115
										75	2.542	5.420	416.741	480.281
										100	2.542	5.420	416.741	484.448

From table 1 it is observed that the demand rate parameters τ and ϕ have similar effects on the optimal values of the decision variables t_1^*, t_3^* and Q^*. An increase in these parameters decreases the values of the decision variables. Optimal values of the total cost per unit time TC^* will increase if τ is increased and decrease if ϕ is increased. The change in τ has relatively more significant effect on TC^* than that of the change in ϕ. The increase in the values of the production rate parameters ϕ and θ increase the values of all the decision variables t_1^*, t_3^*, Q^* and TC^*. Both the parameters have moderate to high influences on the optimal values.

The deterioration distribution parameters α and β have significant effect on t_1^* and Q^* and lower effects on t_3^* and TC^*. In all cases the increase in these parameters results in a decrease in the optimal values of the variables. When the unit production cost *p* increases, t_3^* also increases. On the contrary, t_3^* decreases when the unit holding cost *h* increases. Both parameters have increasing effects on TC^*. The unit shortage cost has negative influence on t_1^*, t_3^*, and Q^* and positive influence on TC^*.

3.4. SENSITIVITY ANALYSIS

To study the effects of changes in the parameters on the optimal values of the decision variables of the model we perform a sensitivity analysis. Let τ=60, ϕ=0.05, α=0.04, β=2, γ=0.5, θ=120, ϕ=0.6, *p*=6, *h*=4 and c_2=2 in appropriate units. Sensitivity analysis is then performed by changing these parameter values by -15%, -10%, -5%, 5%, 10% and 15%, first changing the value of one parameter at a time while keeping all the rest at their original values and then simultaneously changing the values of all the parameters. The results are presented in table 2. The relationships between parameters, costs and the optimal values are shown in Figure 2.

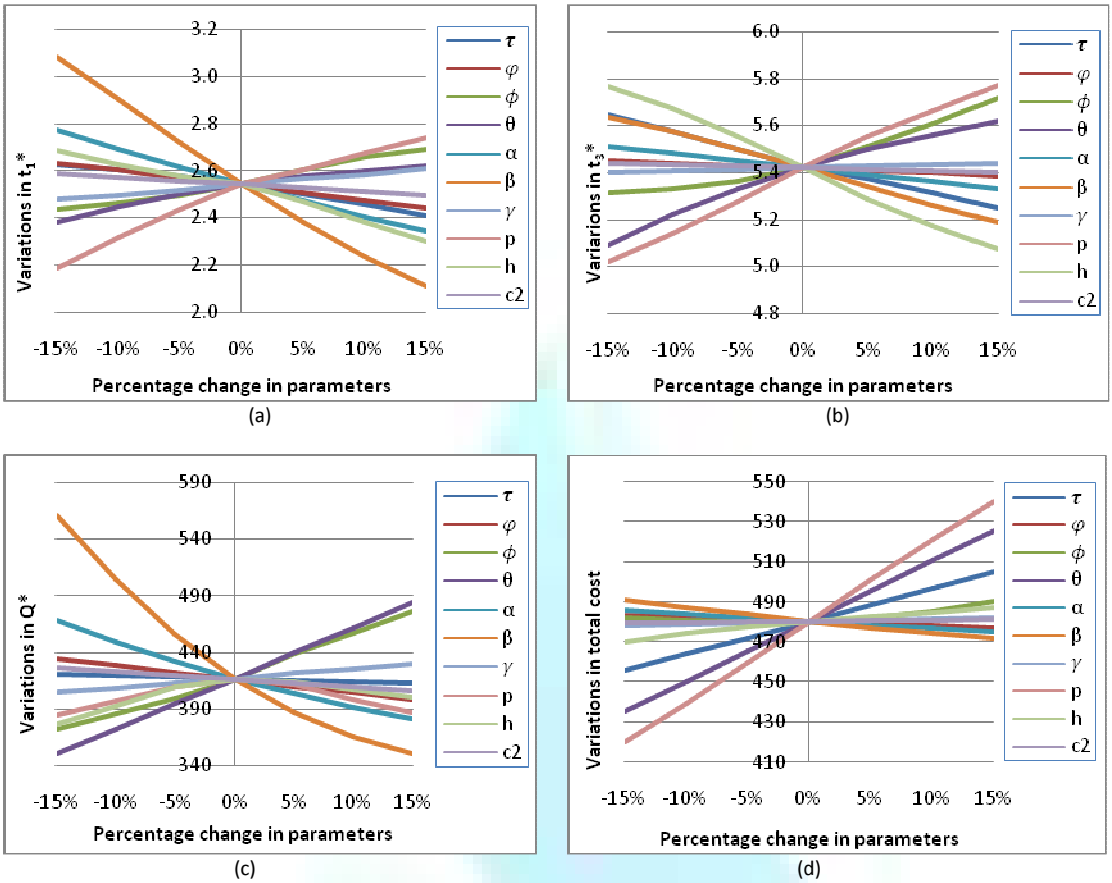
From table 2 it is observed that the production down-time t_1^* is highly sensitive to the changes in the deterioration distribution parameters α and β and the unit production cost *p*. For example a 15% decrease in β results in a 21.164% increase in t_1^* and a 15% increase in β to a 17.034% decrease in the optimal value of t_1^*. The demand and production rate parameters have moderately high influence on t_1^*. The production up-time t_3^* is moderately sensitive to the demand parameter τ, the production parameter θ and cost parameters *p* and *h*.

The production rate parameters θ and ϕ and the deterioration distribution parameters α and β have significant influences on the optimal values of the production quantity Q^*. A 15% decrease in α and β increases Q^* by 12.389% and 34.682% respectively and the same amount increase in θ results in a 16.150% increase in Q^*. The unit production cost and production parameter θ have significant influence on TC^*.

TABLE 2: SENSITIVITY ANALYSIS OF THE MODEL WITH SHORTAGES

arameter Values	Variable	Percentage Change in the parameter Values						
		-15%	**-10%**	**-5%**	**0%**	**+5%**	**+10%**	**+15%**
τ= 60	t_1^*	2.628	2.605	2.576	2.542	2.503	2.459	2.410
	t_3^*	5.646	5.574	5.499	5.420	5.334	5.344	5.147
	Q^*	421.11	420.162	418.894	416.741	415.136	413.844	413.149
	TC^*	455.759	463.875	472.047	480.281	488.582	496.949	505.382
ϕ=0.05	t_1^*	2.630	2.605	2.567	2.542	2.504	2.479	2.442
	t_3^*	5.447	5.439	5.428	5.420	5.407	5.399	5.386
	Q^*	434.361	429.252	421.624	416.741	409.513	404.908	398.311
	TC^*	483.319	482.450	481.148	480.281	478.983	478.119	476.827
ϕ=0.6	t_1^*	2.437	2.454	2.488	2.542	2.606	2.660	2.681
	t_3^*	5.315	5.329	5.362	5.420	5.503	5.609	5.717
	Q^*	376.695	386.085	398.872	416.741	438.922	461.310	476.469
	TC^*	482.408	480.766	479.992	480.281	481.928	485.226	490.242
θ=120	t_1^*	2.382	2.449	2.501	2.542	2.575	2.600	2.620
	t_3^*	5.092	5.222	5.329	5.420	5.496	5.561	5.618
	Q^*	351.135	372.420	394.372	416.741	439.470	461.786	484.043
	TC^*	435.267	450.185	465.194	480.281	495.435	510.642	525.893
α=0.04	t_1^*	2.772	2.692	2.615	2.542	2.472	2.405	2.342
	t_3^*	5.511	4.581	5.450	5.420	5.389	5.360	5.330
	Q^*	468.370	449.049	431.817	416.741	403.359	391.396	381.054
	TC^*	485.992	484.012	482.107	480.281	478.539	476.879	475.301
β=2	t_1^*	3.080	2.903	2.719	2.542	2.380	2.236	2.109
	t_3^*	5.635	5.574	5.500	5.420	5.338	5.261	5.189
	Q^*	561.274	504.868	455.751	416.741	387.446	366.006	350.260
	TC^*	491.021	487.384	483.733	480.281	477.166	474.441	472.107
γ=0.5	t_1^*	2.481	2.498	2.520	2.542	2.564	2.585	2.607
	t_3^*	5.398	5.404	5.412	5.420	5.426	5.434	5.441
	Q^*	405.244	408.362	412.481	416.741	421.420	425.296	429.860
	TC^*	478.251	478.836	479.561	480.281	480.996	481.706	482.410
p=6	t_1^*	2.186	2.318	2.445	2.542	2.584	2.575	2.538
	t_3^*	5.018	5.139	5.274	5.420	5.554	5.660	5.741
	Q^*	384.768	397.263	409.888	416.741	411.801	396.540	377.121
	TC^*	419.850	439.392	459.577	480.281	501.052	521.296	540.645
h=4	t_1^*	2.500	2.555	2.574	2.542	2.469	2.382	2.299
	t_3^*	5.767	5.672	5.554	5.420	5.287	5.171	5.074
	Q^*	364.293	389.847	408.992	416.741	414.264	407.653	401.000
	TC^*	469.943	474.572	477.849	480.281	482.444	484.676	487.060
c_2=2	t_1^*	2.587	2.572	2.557	2.542	2.526	2.510	2.493
	t_3^*	5.437	5.431	5.425	5.420	5.413	5.407	5.401
	Q^*	426.653	423.277	420.014	416.741	413.321	410.018	406.519
	TC^*	479.300	479.621	479.948	480.281	480.622	480.970	481.325
A=75	TC^*	478.417	479.031	479.656	480.281	480.906	481.531	482.156
All Parameters	t_1^*	2.882	2.809	2.706	2.542	2.338	2.154	1.987
	t_3^*	5.429	5.436	5.442	5.420	5.354	5.274	5.187
	Q^*	384.429	406.217	419.263	416.741	405.630	399.014	396.252
	TC^*	358.086	397.106	438.003	480.281	523.581	569.036	616.160

FIG. 2: SENSITIVITY ANALYSIS OF SYSTEM VARIABLES WITH RESPECT TO THE PARAMETERS AND COSTS FOR THE MODEL WITH SHORTAGES



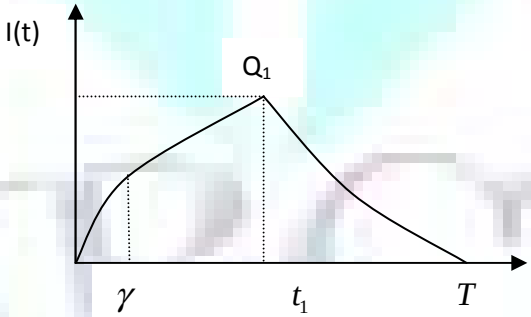
(a) (b) (c) (d)

4. INVENTORY MODEL WITHOUT SHORTAGES

4.1. MODEL FORMULATION

Consider an inventory system for deteriorating items in which the lifetime of the commodity is random and follows three parameter Weibull distribution. Here it is assumed that shortages are not allowed. Then in this system the inventory level changes during $(0,\gamma)$ due to demand and production, during (γ,t_1) due to deterioration, demand and production and during (t_1,T) due to demand and deterioration. At time *T=0* the inventory is zero and production starts again. The schematic diagram representing the inventory system is shown in Fig. 3

FIG. 3: SCHEMATIC DIAGRAM REPRESENTING THE INVENTORY LEVEL OF THE SYSTEM WITH NO SHORTAGES



Given the assumptions in section (3.2) the differential equations governing the system in the cycle time [0, T] are:

$$\frac{dI(t)}{dt}=\{\theta-\phi I(t)\}-(\tau+\varphi I(t)),\ 0\le t\le\gamma \tag{25}$$

$$\frac{dI(t)}{dt}=\{\theta-\phi I(t)\}-\{\alpha\beta(t-\gamma)^{\beta-1}I(t)\}-(\tau+\varphi I(t),\ \gamma\le t\le t_1 \tag{26}$$

$$\frac{dI(t)}{dt}=-\{\alpha\beta(t-\gamma)^{\beta-1}I(t)\}-(\tau+\varphi I(t),\ t_1\le t\le T \tag{27}$$

With boundary conditions;

$$I(0)=0 \quad \text{and} \quad I(T)=0$$

Using the integrating factor $e^{(\phi+\varphi)t}$, the solutions of the differential equations (25) to (27) are respectively

$$\mathrm{I}(t)=\frac{(\theta-\tau)}{\phi+\varphi}(1-e^{-(\phi+\varphi)t}),\ 0\le t\le \gamma \tag{28}$$

And

$$\mathrm{I}(t)=(\theta-\tau)e^{-\left\{(\phi+\varphi)t+\alpha(t-\gamma)^{\beta}\right\}}\left\{\mathrm{B}+\mathrm{t}+\frac{(\phi+\varphi)}{2}t^{2}+\frac{\alpha(t-\gamma)^{\beta+1}}{\beta+1}\right\},\ \gamma\le t\le t_1 \tag{29}$$

where, *B* is as defined in (20)

Using similar procedure as that of the model with shortages we get the following results.

The maximum inventory level, Q_1 is:

$$Q_1=\tau e^{-\varphi t_1-\alpha(t_1-\gamma)^{\beta}}\left\{T-t_1+\frac{\varphi(T^2-t_1^{\,2})}{2}+\frac{\alpha\left\{(T-\gamma)^{\beta+1}-(t_1-\gamma)^{\beta+1}\right\}}{(\beta+1)}\right\} \tag{30}$$

Stock loss due to deterioration at any time *t* is

$$L(t)=\int_0^t R(t)dt-\int_0^t D(t)dt-I(t)$$

$$L(t)=\begin{cases}(\theta-\tau)t-(\phi+\varphi)\left\{\int_0^{\gamma}I(t)\,dt+\int_{\gamma}^{t}I(t)\,dt\right\}-I(t), & \gamma\le t\le t_1\\ (\theta-\tau)t_1-(\phi+\varphi)\left\{\int_0^{\gamma}I(t)\,dt+\int_{\gamma}^{t_1}I(t)\,dt\right\}-\tau(t-t_1) & \\ \qquad -\varphi\int_{t_1}^{t}I(t)\,dt-I(t), & t_1\le t\le T\\ 0, \quad \textit{else where} & \end{cases} \tag{31}$$

Total Production in the cycle time $(0,T)$ is

$$Q=\int_0^{\gamma}R(t)dt+\int_{\gamma}^{t_1}R(t)dt$$

This implies

$$\begin{aligned}Q=\ &\theta t_1-\frac{\phi(\theta-\tau)}{(\phi+\varphi)^2}\left\{(\phi+\varphi)\gamma+e^{-(\phi+\varphi)\gamma}-1\right\}\\ &-\phi(\theta-\tau)\left\{\mathrm{B}t_1+\frac{1}{2}t_1^{\,2}(1-(\phi+\varphi)B)-\frac{1}{6}(\phi+\varphi)t_1^{\,3}-\frac{1}{8}(\phi+\varphi)^2t_1^{\,4}\right.\\ &+\frac{2\alpha(t_1-\gamma)^{\beta+2}}{(\beta+1)(\beta+2)}-\frac{\alpha(t_1-\gamma)^{\beta+1}}{\beta+1}\left(B+t_1+\frac{1}{2}(\phi+\varphi)t_1^{\,2}\right)-\frac{\alpha^2(t_1-\gamma)^{2(\beta+1)}}{2(\beta+1)^2}\\ &\left.-B\gamma-\frac{1}{2}\gamma^2(1-(\phi+\varphi)B)+\frac{1}{6}(\phi+\varphi)\gamma^3+\frac{1}{8}(\phi+\varphi)^2\gamma^4\right\}\end{aligned} \tag{32}$$

Total cost is the sum of setup cost per unit time, the production cost per unit time and inventory holding cost per unit time. In this model the cycle time is also assumed to be a decision variable. Let $TC(t_1,T)=TC$ be the total cost per unit time for this model.

Therefore

$$TC=\frac{A}{T}+\frac{pQ}{T}+\frac{h}{T}\left\{\int_0^{\gamma}I(t)\,dt+\int_{\gamma}^{t_1}I(t)\,dt+\int_{t_1}^{T}I(t)\,dt\right\}$$

This implies

$$TC = \frac{A}{T} + \frac{p\theta t_1}{T} + \frac{h-p\phi}{T}\frac{(\theta-\tau)}{(\phi+\varphi)^2}\left\{(\phi+\varphi)\gamma + e^{-(\phi+\varphi)\gamma} - 1\right\}$$
$$+\frac{(h-p\phi)}{T}(\theta-\tau)\left\{Bt_1 + \frac{1}{2}t_1^{\,2}\left(1-(\phi+\varphi)B\right) - \frac{1}{6}(\phi+\varphi)t_1^{\,3} - \frac{1}{8}(\phi+\varphi)^2 t_1^{\,4}\right.$$
$$+\frac{2\alpha(t_1-\gamma)^{\beta+2}}{(\beta+1)(\beta+2)} - \frac{\alpha(t_1-\gamma)^{\beta+1}}{\beta+1}\left(B+t_1+\frac{1}{2}(\phi+\varphi)t_1^{\,2}\right) - \frac{\alpha^2(t_1-\gamma)^{2(\beta+1)}}{2(\beta+1)^2} - B\gamma$$
$$\left.-\frac{1}{2}\gamma^2\left(1-(\phi+\varphi)B\right) + \frac{1}{6}(\phi+\varphi)\gamma^3 + \frac{1}{8}(\phi+\varphi)^2\gamma^4\right\}$$
$$+\frac{h}{T}\tau\left\{\left[T+\frac{1}{2}\varphi T^2 + \frac{\alpha(T-\gamma)^{\beta+1}}{(\beta+1)}\right]\left[(T-t_1) - \frac{\varphi}{2}\left(T^2-t_1^{\,2}\right) - \frac{\alpha\left\{(T-\gamma)^{\beta+1} - (t_1-\gamma)^{\beta+1}\right\}}{(\beta+1)}\right]\right.$$
$$-\frac{1}{2}\left(T^2-t_1^{\,2}\right) + \frac{\varphi}{6}\left(T^3-t_1^{\,3}\right) + \frac{\varphi^2}{8}\left(T^4-t_1^{\,4}\right) + \frac{\alpha(T-\gamma)^{\beta+1}}{(\beta+1)}\left[T+\frac{1}{2}\varphi T^2\right]$$
$$\left.-\frac{\alpha(t_1-\gamma)^{\beta+1}}{(\beta+1)}\left[t_1+\frac{1}{2}\varphi t_1^{\,2}\right] - \frac{2\alpha\left[(T-\gamma)^{\beta+2} - (t_1-\gamma)^{\beta+2}\right]}{(\beta+1)(\beta+2)} + \frac{\alpha^2\left[(T-\gamma)^{2(\beta+1)} - (t_1-\gamma)^{2(\beta+1)}\right]}{2(\beta+1)^2}\right.$$

(33)

4.2. Optimal policies of the model

The problem here is to find out the optimal values of the production down-time, t_1 and cycle length, T that minimize the total cost over the interval $[0,T]$. To obtain these values we differentiate $TC(t_1,T)$ in equation (33) with respect to t_1 and T and equate them to zero.

The condition for the solutions to be optimal (minimum) is that the determinant of the Hessian matrix to be positive definite, i.e.

$$D = \begin{vmatrix} \frac{\partial^2 TC(t_1,T)}{\partial t_1^2} & \frac{\partial^2 TC(t_1,T)}{\partial t_1 \partial T} \\ \frac{\partial^2 TC(t_1,T)}{\partial t_1 \partial T} & \frac{\partial^2 TC(t_1,T)}{\partial T^2} \end{vmatrix} > 0$$

Differentiating $TC(t_1,T)$ with respect to t_1 and equating to zero we get

$$\frac{p\theta}{T} + \frac{(h-p\phi)}{T}(\theta-\tau)\left\{B + \left(1-(\phi+\varphi)B\right)t_1 - \frac{1}{2}(\phi+\varphi)t_1^{\,2} - \frac{1}{2}(\phi+\varphi)^2 t_1^{\,3}\right\}$$
$$+\frac{\alpha}{\beta+1}(t_1-\gamma)^{\beta+1}\left(1-(\phi+\varphi)t_1\right) - \alpha(t_1-\gamma)^{\beta}\left(B+t_1+\frac{1}{2}(\phi+\varphi)t_1^{\,2}\right)$$
$$-\frac{\alpha^2(t_1-\gamma)^{2\beta+1}}{(\beta+1)} + \frac{\tau h}{T}\left\{\left[T+\frac{1}{2}\varphi T^2\frac{\alpha}{(\beta+1)}(T-\gamma)^{\beta+1}\right]\left[\alpha(t_1-\gamma)^{\beta}+\varphi t_1-1\right]+t_1\right.$$
$$\left.-\frac{1}{2}\varphi t_1^{\,2} - \frac{1}{2}\varphi^2 t_1^{\,3} - \alpha(t_1-\gamma)^{\beta}\left(t_1+\frac{1}{2}\varphi t_1^{\,2}\right) + \frac{\alpha(t_1-\gamma)^{\beta+1}}{(\beta+1)}(1-\varphi t_1) - \frac{\alpha^2(t_1-\gamma)^{2\beta+1}}{(\beta+1)}\right\} = 0 \quad (34)$$

Differentiating $TC(t_1,T)$ with respect to T and equating to zero we get

$$-\frac{A}{T^2} - \frac{p\theta t_1}{T^2} - \frac{h-p\phi}{T^2}\frac{(\theta-\tau)}{(\phi+\varphi)^2}\left\{e^{-\gamma(\phi+\varphi)} + \gamma(\phi+\varphi) - 1\right\}$$
$$-\frac{(h-p\phi)}{T^2}(\theta-\tau)\left\{Bt_1 + \frac{1}{2}t_1^{\,2}\left(1-(\phi+\varphi)B\right) - \frac{1}{6}(\phi+\varphi)t_1^{\,3} - \frac{1}{8}(\phi+\varphi)^2 t_1^{\,4}\right.$$
$$+\frac{2\alpha(t_1-\gamma)^{\beta+2}}{(\beta+1)(\beta+2)} - \frac{\alpha(t_1-\gamma)^{\beta+1}}{\beta+1}\left(B+t_1+\frac{1}{2}(\phi+\varphi)t_1^{\,2}\right) - \frac{\alpha^2(t_1-\gamma)^{2(\beta+1)}}{2(\beta+1)^2}$$

$$-B\gamma-\frac{1}{2}\gamma^2\left(1-(\phi+\varphi)B\right)+\frac{1}{6}(\phi+\varphi)\gamma^3+\frac{1}{8}(\phi+\varphi)^2\gamma^4\Bigg\}$$

$$+\tau h\Bigg\{\left[\frac{1}{2}\varphi+\frac{\alpha}{T}(T-\gamma)^{\beta}-\frac{\alpha(T-\gamma)^{\beta+1}}{T^2(\beta+1)}\right]\left[(T-t_1)-\frac{\varphi}{2}\left(T^2-t_1^2\right)-\frac{\alpha\left\{(T-\gamma)^{\beta+1}-(t_1-\gamma)^{\beta+1}\right\}}{(\beta+1)}\right]$$

$$+\left[1+\frac{1}{2}\varphi T+\frac{\alpha(T-\gamma)^{\beta+1}}{T(\beta+1)}\right]\left[1-\varphi T-\alpha(T-\gamma)^{\beta}\right]-\frac{1}{2}-\frac{t_1^2}{2T^2}\left(\frac{\varphi^2 t_1^2}{4}+\frac{\varphi t_1}{3}-1\right)$$

$$+\frac{\varphi}{3}T+\frac{3}{8}\varphi^2T^2+\frac{\alpha(T-\gamma)^{\beta+1}}{(\beta+1)}\left(\frac{\varphi}{2}-\frac{2}{T}\right)+\alpha(T-\gamma)^{\beta+1}\left(1+\frac{1}{2}\varphi T\right)$$

$$+\frac{\alpha(t_1-\gamma)^{\beta+1}}{T^2(\beta+1)}\left[t_1+\frac{1}{2}\varphi t_1^2\right]+\frac{2\alpha\left[(T-\gamma)^{\beta+2}-(t_1-\gamma)^{\beta+2}\right]}{T^2(\beta+1)(\beta+2)}$$

$$-\frac{\alpha^2\left[(T-\gamma)^{2(\beta+1)}-(t_1-\gamma)^{2(\beta+1)}\right]}{2T^2(\beta+1)^2}+\frac{\alpha^2(T-\gamma)^{2\beta+1}}{(\beta+1)T}\Bigg\}=0 \qquad (35)$$

4.3. NUMERICAL ILLUSTRATION

Consider the case of deriving an economic production quantity and other optimal policies for a food processing industry considered in example 1. The optimal values t_1^*, T^*, Q^* and TC^* of t_1, T, Q and TC for different values of costs and parameters are determined and presented in table 3.

TABLE 3: OPTIMAL SOLUTIONS OF THE MODEL WITH SHORTAGES FOR DIFFERENT VALUES OF THE PARAMETERS

τ	ϕ	ϕ	θ	α	β	γ	p	h	A	t_1^*	T^*	Q^*	TC^*
50	0.05	0.6	120	0.04	2	0.50	5.0	4.0	75	1.462	4.346	155.427	467.681
55										1.589	4.242	172.491	482.429
60										1.691	4.150	187.238	495.681
65										1.774	4.069	199.911	507.432
60	0.04	0.6	120	0.04	2	0.50	5.0	4.0	75	1.784	4.233	199.218	500.801
	0.05									1.691	4.150	187.238	495.681
	0.06									1.604	4.072	176.446	490.577
	0.07									1.525	3.997	166.970	485.457
60	0.05	0.4	120	0.04	2	0.50	5.0	4.0	75	1.624	4.242	175.812	514.581
		0.5								1.668	4.167	180.970	502.880
		0.6								1.691	4.150	187.238	495.681
		0.7								1.690	4.208	193.962	494.345
60	0.05	0.6	100	0.04	2	0.50	5.0	4.0	75	1.855	3.961	177.483	437.868
			110							1.775	4.058	183.479	467.507
			120							1.691	4.150	187.238	495.681
			130							1.601	4.238	188.647	522.448
60	0.05	0.6	120	0.03	2	0.50	5.0	4.0	75	2.069	4.521	244.124	507.312
				0.04						1.691	4.150	187.238	495.681
				0.05						1.434	3.878	155.138	485.189
				0.06						1.247	3.669	133.960	475.963
60	0.05	0.6	120	0.04	1	0.50	5.0	4.0	75	3.533	5.482	705.207	519.143
					2					1.691	4.150	187.238	495.681
					3					0.942	3.294	101.602	468.466
					4					0.603	2.901	66.743	453.539
60	0.05	0.6	120	0.04	2	0.40	5.0	4.0	75	1.601	4.067	175.879	491.502
						0.50				1.691	4.150	187.238	495.681
						0.60				1.781	4.232	199.080	499.600
						0.70				1.871	4.312	211.464	503.245
60	0.05	0.6	120	0.04	2	0.50	5.0	4.0	75	1.810	3.826	203.915	439.486
							6.0			1.691	4.150	187.238	495.681
							7.0			1.516	4.334	164.797	543.491
							8.0			1.347	4.460	144.944	584.531
60	0.05	0.6	120	0.04	2	0.50	5.0	3.5	75	1.536	4.308	167.254	472.003
								4.0		1.691	4.150	187.238	495.681
								4.5		1.793	3.961	201.452	514.231
								5.0		1.830	3.746	206.850	529.415
60	0.05	0.6	120	0.04	2	0.50	5.0	4.0	50	1.707	4.164	189.407	490.077
									75	1.691	4.150	187.238	495.681
									100	1.674	4.136	184.957	501.313
									125	1.656	4.122	182.567	506.974

From table 3 it is observed that the optimal production down-time t_1^*, increases when the demand parameter τ, the production rate parameter ϕ, the deterioration distribution parameter γ, and the unit holding cost h are increasing. On the other hand the optimal cycle length T^* increases when the values of θ, γ and p increase and decrease when other parameters increase. The optimal production quantity Q^* increases when the values of τ, ϕ, θ, γ and h are increasing, and decreases when the values of other parameters are increase. The increase in τ, θ, γ and all cost parameters results in an increase in TC^*.

4.4. Sensitivity Analysis

To study the effects of changes in the parameters on the optimal values of the decision variables of the model we perform a sensitivity analysis. The sensitivity analysis of the model without shortages is carried with the same set of parameters as that of the model with shortages and the results are presented in table 4. The relationships between production quantity and parameters and that of optimal total cost and parameters are shown in Figures 5 and 6 respectively.

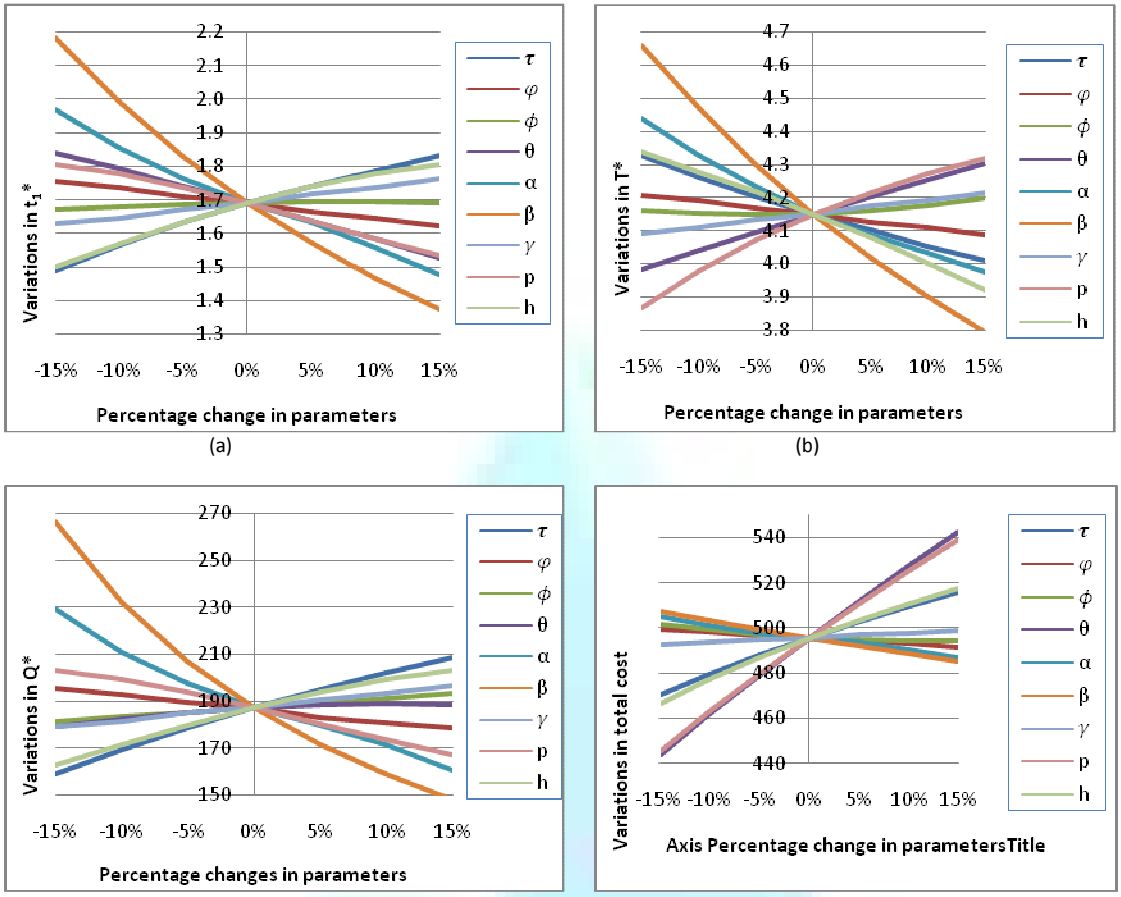
It can be observed from table 4 that the demand parameter τ has significant influence on the optimal values of t_1^* and Q^* and the production parameter θ a moderately high effect on the optimal values t_1^* and TC^*. The deterioration distribution parameters α and β immensely influence the values of t_1^* and Q^*. For example a 15% decrease in α increases t_1^* by 17.031% and Q^* by 22.450%. The same amount of decrease in β increases t_1^* by 29.154%, T^* by 12.265% and Q^* by 42.127%. The increase in these parameter values also have a significant decreasing effect on t_1^*, T^* and Q^*.The location parameter γ has a relatively lower effect on the decision variables. The cost parameters p and h also have significant influence on t_1^* and Q^*.

The optimal TC^* is highly sensitive to the changes in θ and p and slightly sensitive to others. Generally the optimal production down-time and the production quantity are more sensitive to the changes in the parameter values than the optimal cycle time and total cost.

TABLE 4: SENSITIVITY ANALYSIS OF THE MODEL WITH SHORTAGES

Parameter Values	Variable	Percentage Change in the parameter Values						
		-15%	**-10%**	**-5%**	**0%**	**+5%**	**+10%**	**+15%**
τ=60	t_1^*	1.490	1.566	1.632	1.691	1.742	1.788	1.830
	T^*	4.325	4.262	4.204	4.150	4.101	4.054	4.011
	Q^*	159.067	169.294	178.599	187.238	194.969	202.116	208.762
	TC^*	470.494	479.570	487.940	495.681	502.914	509.630	515.948
ϕ=0.05	t_1^*	1.755	1.736	1.709	1.691	1.664	1.647	1.621
	T^*	4.208	4.191	4.167	4.150	4.127	4.111	4.087
	Q^*	195.425	192.967	189.518	187.238	181.198	181.735	178.526
	TC^*	499.277	498.245	496.728	495.681	494.189	493.143	491.589
ϕ=0.6	t_1^*	1.671	1.679	1.686	1.691	1.693	1.694	1.692
	T^*	4.162	4.152	4.148	4.150	4.160	4.177	4.199
	Q^*	181.514	183.246	185.196	187.238	189.217	191.386	193.426
	TC^*	501.924	499.380	497.291	495.681	494.633	494.147	494.191
θ=120	t_1^*	1.840	1.792	1.742	1.691	1.637	1.583	1.527
	T^*	3.981	4.039	4.096	4.150	4.203	4.255	4.304
	Q^*	178.952	182.551	185.257	187.238	188.257	188.759	188.503
	TC^*	443.919	461.698	478.966	495.681	511.899	527.631	542.810
α=0.04	t_1^*	1.979	1.823	1.754	1.691	1.632	1.577	1.479
	T^*	4.437	4.285	4.215	4.150	4.089	4.032	3.926
	Q^*	229.273	205.565	195.804	187.238	179.489	172.483	160.473
	TC^*	504.945	500.261	497.940	495.681	493.474	491.334	487.165
β =2	t_1^*	2.184	1.992	1.829	1.691	1.571	1.467	1.376
	T^*	4.659	4.470	4.301	4.150	4.018	3.900	3.795
	Q^*	266.115	232.110	206.697	187.238	171.595	158.840	148.192
	TC^*	507.169	503.395	499.520	495.681	492.056	488.610	485.393
γ=0.5	t_1^*	1.628	1.646	1.673	1.691	1.718	1.736	1.763
	T^*	4.092	4.109	4.134	4.150	4.175	4.191	4.216
	Q^*	179.239	181.502	184.929	187.238	190.737	193.095	196.670
	TC^*	492.783	493.636	494.882	495.681	496.892	497.669	498.845
p=6	t_1^*	1.805	1.778	1.738	1.691	1.639	1.586	1.534
	T^*	3.867	3.979	4.073	4.150	4.216	4.271	4.319
	Q^*	203.188	199.302	193.672	187.238	180.333	173.510	167.007
	TC^*	445.436	462.925	479.714	495.681	510.898	525.316	539.046
h =4	t_1^*	1.500	1.570	1.634	1.691	1.739	1.778	1.806
	T^*	4.337	4.278	4.217	4.150	4.079	4.001	3.919
	Q^*	162.850	171.489	179.681	187.238	193.811	199.302	203.333
	TC^*	466.558	477.558	486.914	495.681	503.651	510.847	517.460
A =75	t_1^*	1.698	1.696	1.693	1.691	1.688	1.685	1.683
	T^*	4.157	4.155	4.153	4.150	4.148	4.146	4.144
	Q^*	188.184	187.913	187.508	187.238	186.834	186.430	186.161
	TC^*	493.188	494.020	494.877	495.681	496.539	497.373	498.220
All Parameters	t_1^*	2.454	2.162	1.893	1.691	1.525	1.401	1.296
	T^*	4.763	4.580	4.354	4.150	3.966	3.817	3.686
	Q^*	250.179	225.697	202.707	187.238	175.157	167.285	160.862
	TC^*	375.471	415.177	454.852	495.681	537.272	581.049	626.090

FIGURE 4: SENSITIVITY ANALYSIS OF SYSTEM VARIABLES WITH RESPECT TO THE PARAMETERS AND COSTS FOR THE MODEL WITHOUT SHORTAGES.



5. CONCLUSION

In this paper, a production inventory model for deteriorating items with stock dependent demand and Weibull decay for both with and without shortages has been developed and analyzed in the light of various parameters and cost. The optimal production schedule is derived. This model also includes the exponential decay model as a particular case for specific values of the parameters. This model is having potential applications in manufacturing and production industries like Cement and Food processing, where the deterioration of the commodity is random and follows Weibull distribution. It is also observed that in the industries the demand is a function of stock on hand. The proposed models can further be enriched by incorporating salvage of deteriorated units, inflation, quantity discount, and trade credits etc. It can also be extended to a multi-commodity model with constraints on budget, shelf space, etc., These models may also be formulated in fuzzy environments.

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CHALLENGES BEFORE BUSINESS EDUCATION IN INDIA

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ABSTRACT

Business education mainly comprises of commerce and management education. Business education broadly aims at imparting knowledge, developing skills and qualities to make a person successful manager, businessman or an industrialist. Business education today is passing through a critical phase with the advent of new economic policy in 1991, the demand for a business education is increasing. It may continue to rise as we enter in the 21st century. The number of business schools has tremendously gone up and different dimensions are being added to their structure and curriculum design. These business schools are now confronted with new challenges. The business environment will be ever changing, and it is an essential element or aspect of growth. The business educators should understand this. The business environment should be analysed carefully before developing the curriculum. In this paper, an attempt is made to assess the present position of business education, challenges before it and how to meet these challenges.

KEYWORDS

Business Education, Curriculum, Business Houses, Business Environment.

GENESIS OF BUSINESS EDUCATION IN INDIA

The commerce discipline was considered as a part of the economics discipline and there was no separate commerce faculty in most of the Indian universities in 60's. With the rapid professionalization in industry, trade, banking, insurance and government undertakings commerce education has also established its own strength and intensity both in the academic and business world. Business education in India comprised of commerce education, professional education and management education. The first commercial school was started in 1886 by the pachiappa's charities. In 1913 the Sydenham College of Commerce and Economics was established by the government in Bombay. In 1955 an institute was started for cost accounting but by 1960's there were about 35 universities offering commerce courses along with 15 secondary education boards dealing with commerce education at school level. Business education mainly comprises of commerce and management education. In the early phase of 1980's commerce education had become quite popular and this led to quantitative expansion of business education in terms of student's enrolment, number of institutions and faculty status.

IMPORTANCE OF BUSINESS EDUCATION

- Better employment prospects motivate many to aspire degrees/diplomas in business education
- It also offers a good scope for self employment ventures.
- It makes youngsters to learn the intricacies of business.
- Business houses give preference to people who have or with qualification.
- Globalization leads to business education in India. This necessitiates learness to acquire knowledge in foreign exchange, import and export procedure.
- In a growing economy, business complexities are common. Courses on business law thrive much as those qualified in law have good opportunities to wide away such complexities.

CHALLENGES BEFORE BUSINESS SCHOOLS IN INDIA

The B-Schools across the globe and Indian b-schools in particular are facing various challenges at various dimensions in the current scenario. The most intriguing aspect is on the retention of quality faculty members who are the right blend of academics, research and consulting. The teachers who can give the best of the academic inputs to the budding business professionals, imbibe professional values, can inspire the students/participants to be the business leaders of tomorrow is a rare species. The turnover rate of faculty members across the globe is an area of immense concern to the top echelons of the various b-schools. So, to conclude the b-schools across the globe are facing a big challenge of attracting and retaining the quality talent with the right blend of desired pre-requisites.

The second major area of concern is in managing the best placement avenues for the students. A majority of the second rung b-Schools are finding it difficult to manage the best of the placements for all the students studying on campus. The problems of inviting the corporate HR Managers to the campus, the HR Managers being skeptical of getting the right kind of skills, coupled with problems with communication, presentation skills and lack of academic rigour together enhances the severity of the problem.

Focus on research has been a major area of challenge in the light of major research findings becoming obsolete and redundant in the light of the advent of internet technologies and the increasing demand of techno-business professionals by the corporate world. The focus of the research has to be gradually oriented towards the tools of the digital economy. The research topics are gradually being oriented towards the techno-business issues etc. like e-business, e-ecommerce, Internet Security, Internet Marketing, Online Recruitment, Online Trading etc.

The B-Schools are finding it increasingly difficult to invite the talent from the corporate world and retain them as faculty members. So, a majority of Indian b-Schools are suffering from the syndrome that the management teachers who are teaching the budding doyens of the corporate world have never been or seen the corporate world, lifestyle, functioning and are least aware of the practical intricacies and nuances of the corporate world. It may be advisable to the regulatory bodies to make it compulsory to the management teachers to keep themselves abreast with the latest movements of the real life happenings of the corporate world so as to equip themselves with the latest and upgraded knowledge to guide/teach the budding corporate doyens. Organizing International Conferences and seminars are also a big challenge in front of the leading B-Schools. The International Conferences and seminars provide a special platform to the researchers, academicians and the corporate doyens to share a common platform to leverage the knowledge acquired in the world of academics and the practical world. The process of organizing International Conferences and Seminars require a good allocation of funds to make it successful. But Indian B-Schools are yet to catch the foreign B-Schools in terms of their focus on organizing the International Conferences and Seminars. Though

there are various funding and sponsoring bodies sponsoring such conferences and seminars, but what is pathetically lacking in various Indian b-Schools is a dedicated team of Faculty Members committed to such causes and having a strong entrepreneurial zeal duly supported by the students body to supplement such cause.

The most important challenge to the different b-Schools of India is in terms of bagging Corporate Consultancy assignments and to deliver them successfully with the highest degrees of customer ecstasy. The majority of the Indian b-Schools are involved in run-of-the mill teaching process and the faculty members devoting maximum time in teaching, teaching and teaching having left with little or no time to bag and deliver corporate consultancy assignments. The challenge is on various frontiers including gaining the confidence level of the corporate world to an extent that they can trust them and deliver a consulting assignment which can add value to both the faculty member and the corporate world. Management development programmes and Executive Development programmes are also a big challenge in front of the B-Schools. More that 90 % of the Indian B-Schools are not conducting Management Development Programmes and Executive Development Programmes. The b-Schools which conduct MDP and EDP programmes get consistent enrichment of knowledge by the experience sharing process during the MDP programme and EDP programme. The process of conducting MDP and EDP progammmes is a win-win process for both the Faculty Members as well as the participants coming from the corporate world. Managing Digital libraries and collaborative access of library resources is becoming a big challenge in the currents scenario. The various b-schools are not in a condition to afford the various costly digital resources and the various international journals, digital resources, databases and other high-end resources for the library. The libraries of the schools of the various developing economies and the under developed economies are facing an acute problem in managing the most updated digital resources to keep their students and faculty members updated. The b-schools must enter into a collaborative set-up to maximize the use of digital resources at their discretion and to minimize the cost of access and overall affordability to the students. The most important challenge in front of the various b-schools across India is in the light of the cost-benefit analysis. India has one of the highest disparities in terms of the overall fee structure. The fees charged by the government run Faculty of Management Studies is just few thousands for the MBA programme whereas some private institutions in the private sector are charging in the range of 2.5 to 25 lakhs for the Masters Programme in Management.

It's becoming increasingly difficult to meet the regulatory norms of stipulatory number of Faculty Members, their salary as per stipulated norms, library, computer etc. and to be cost effective in the light of rapid increase in the real estate prices and the huge cost of maintaining such a huge infrastructure to sustain a b-school. Brand Positioning of the B-School is a big challenge among over one thousand Indian B-schools. Only a chosen few are able to have a good image in the minds of the corporate world because they have been consistent in terms of pursuing research, publishing journals, providing IT and Management Consultancy services to the corporate world, consistently organizing International conferences and seminars, and consistently providing good placements to the students. The salary package offered by the corporate world to the passing out students one of the most important parameters for which most of the b-schools are rubbing shoulders. The international placements are also a big challenge faced by many of the leading b-schools. The PPO's (Pre Placement offers) and LPO (lateral Placement offers) are an important benchmark these days in the leading b-Schools for having a competitive positioning.

INSTITUTIONAL CHALLENGES

In recent years, India has experienced a large increase in the number of institutions offering graduate management programs. Most of these have been private institutions. Three particular consequences of this are of significance. Given the relative infancy of graduate business education in India—the Indian Institutes of Management (IIM), Indian Institutes of Technology (IIT), and a handful of other well established and highly reputable institutions apart—it is not clear whether international standards have been achieved within much of the sector. Even programs at the leading institutions, while being comparable in quality to those of leading programs globally are, for a variety of reasons, not accredited by international bodies such as AACSB International. Domestically, there is also no single accreditation agency, with more than a dozen agencies serving this role. The central government's National Assessment and Accreditation Council have, for example, accredited only 15 business schools (Damast, 2008). An additional challenge is that attaining status as a 'deemed university,' which is required to offer an MBA degree, can come only from the University Grants Commission (UGC). The UGC is a government body that establishes and maintains educational standards within the higher education sector. However, the actions of the UGC are not necessarily driven by academics but also by politics and influence (Phatak, 2005). With new and largely private institutions entering the fold, there is a real risk that the overarching goal, certainly in the near term, is either financial or to have a presence in the marketplace, with educational quality and academic integrity being of secondary importance. Absent appropriate mechanisms to ensure oversight of academic quality, this is reason for concern. Related to the issue of academic standards is that of faculty qualifications. The growth in the number of business schools, the financial lure of the private sector, and a 'stigma' associated with doctoral qualifications, have led to a shortage of qualified faculty.

Even the leading institutions are not immune to the challenges of faculty shortages. Increasing demand for business education is increasing the teaching burden. Not only does this come at the expense of other academic pursuits such as scholarship, it places greater emphasis on generating alternative revenue sources in an attempt to attract and retain faculty and otherwise compete with private academic institutions and the corporate sector. Consulting and management training are common among faculty at the leading business schools as means of supplementing institutional revenue as well as faculty salaries. Particularly at the more prestigious institutions that may have a dual role of teaching and research, increased instructional roles may have the impact of limiting scholarship and quality faculty-student interaction. These are key motivations for seasoned business practitioners to leave the private sector and join the academy, a common path among business academics. Removing these sources of motivation can serve only to further deplete the ranks of high quality faculty. While private institutions may have greater flexibility when recruiting faculty, particularly when it comes to salaries, this may have a ripple effect as elite public institutions such as the IIM's and IIT's lose top faculty to private institutions. The onus is therefore on the leadership of these institutions to carefully define their missions and plan for the future accordingly.

STUDENTS CHALLENGES

A key factor in the admissions process at the leading institutions as well as several others is the Common Admissions Test. It is typical for students, close to the completion of their undergraduate education, to sit for the test following an intense period of preparation, in anticipation of joining a graduate business program immediately on graduation. The result is a student body, which while academically talented and technically sophisticated—a large proportion of students at the leading business schools come from the premiere engineering programs—lacks work experience and an appropriate context for a graduate business education. This yields a 'youthful' class with limited scope to contribute to their business education and that of their peers, rather than a more mature, business savvy class that can better enhance not only the educational experience, but the reputation of the program and school.

Ironically, this runs counter to the experience of the leading graduate business schools in, for example, the U.S. and Europe, and the original philosophy that drove graduate business education. At these business schools, a premium exists in the admissions process for work experience, maturity, and demonstrated workplace leadership. Such programs seek out applicants with not only outstanding academic credentials, but an understanding of their career goals, how they anticipate advanced study can help achieve these goals, and that can actively contribute to the educational process through their experience. This patterns the original intent underlying MBA programs, to provide individuals with technical backgrounds and experience with the business training necessary as they assume greater managerial responsibilities. An implication of the admissions process is that it results in entering classes of students at the leading business schools, which, having spent the previous several years engaged in a demanding technical education, have seemingly stepped back from their commitment to the advancement of science and technology. Whether this is a reflection of disenchantment with potential careers in science and technology, the lure of large salaries in business, or a failure to define their career aspirations or objectives in obtaining a graduate business degree is not clear. Coupled with the fact that graduates at the leading academic institutions in science and technology are also being increasingly lured by rising private sector salaries rather than continuing to graduate school, one wonders what the consequences may be for the development of future engineering and technology capabilities.

A final observation mimics one already made in many programs in the U.S. A consequence of rapid economic expansion is that students recognize that upon graduation from MBA programs, and in particular, the leading ones, they will command significant salaries. Personal experience as well as that of faculty colleagues is that well before graduation, the commitment and motivation of students begins to wane and as a result students may not fully avail themselves of

the academic opportunities available to them. This runs in the face of the traditional quest for knowledge that is a pillar of Hinduism. This phenomenon is not unique to India. In the U.S., for example, increased interest in MBA and similar degrees over the last 20 or so years, has led to the reality that the primary motivation for earning an MBA for many, is the lure of high salaries, rather than the desire to acquire knowledge, develop leadership skills, and enhance decision making capabilities. The result is that the true value of an MBA degree has been undermined as it increasingly becomes an 'entry level' credential.

BUSINESS SCHOOLS IN INDIA

In line with the changing economic scenarios, B-schools are also diversifying their programs to attract the world market and thus contributing to this transformation process as they are run in a businesslike fashion. There are over 950 B-schools approved by the All India Council for Technical Education (A.I.C.T.E.) in various categories including the Indian Institutes of Management (I.I.M.'s), university departments and autonomous private institutes. However, the sudden spurt in these B-schools has also raised concerns about quality and the need for regulatory mechanisms among academia and industry captains. In India, ranking surveys come out with different sets of rankings for B-schools. The lists of top 50 B-schools in India are as follows:

LIST OF TOP 50 B-SCHOOLS IN INDIA

1. Indian Institute of Management-Ahmedabad(IIM-A)
2. Indian Institute of Management-Bangalore(IIM-B)
3. Indian Institute of Management-Calcutta(IIM-C)
4. Indian Institute of Management-Lucknow(IIM-L)
5. Indian Institute of Management-Indore
6. Indian Institute of Management-Kozhikode(IIM-K)
7. Management Development Institute-Gurgaon(MDI)
8. Faculty of Management Studies-Delhi(FMS)
9. Xavier Labour Relations Institute - Jamshedpur(XLRI)
10. S P Jain Institute of Management & Research
11. Indian Institute of Foreign Trade-Delhi(IIFT)
12. Narsee Monjee Institute of Management Studies-Mumbai(NMIMS)
13. Xavier Institute of Management-Bhubaneswar(XIM)
14. Institute of Management Technology-Ghaziabad(IMT)
15. ICFAI Business School
16. International Management Institute-Delhi(IMI)
17. University Business School-Chandigarh(UBS)
18. Welingkar Institute of Management Development & Research,Mumbai
19. T A Pai Management Institute(TAPMI), Manipal - 576 104, Karnataka
20. Amity Business School, Amity Campus, Sector 44, Noida- 201303.
21. Alliance Business Academy, 19th Cross, 7th Main, BTM II Stage, N.S. Palya Bangalore - 560076.
22. Institute for Financial Management & Research-Chennai(IFMR), 24, Kothari Road, Nungambakkam, Chennai – 600034
23. Nirma Institute of Management, Post: Chandlodia, Via: Gota, Ahmedabad-382481
24. Lal Bahadur Shastri Institute of Management, Shastri Sadan, Sector III, R. K. Puram, New Delhi-110 022
25. K J Somaiya Institute of Management Studies & Research(SIMSR), Vidyanagar , Vidyavihar, Mumbai – 400077
26. Bharathidasan Institute of Management(BIM) Post Box No.12, BHEL Complex, Tiruchirapalli – 620014
27. Birla Institute of Management Technology, Plot Number -5, Knowledge Park -II, Greater NOIDA -201306
28. Indian Institute of Modern Management-Pune(IIMM)
29. SIES College of Managament Studies-Navi Mumbai(SIESCOM), Sri Chandrasekarendra Saraswathy Vidyapuram, Plot 1-E, Sector V, Nerul, Navi Mumbai-06
30. Loyola Institute of Business Administration- Chennai(LIBA)
31. Christ College Institute of Management, Hosur Road, Bangalore-29
32. Indian Institute of Social Welfare and Business Management-Kolkata(IISWBM)
33. Xavier Institute of Management and Entrepreneurship-Bangalore(XIME)
34. Institute of Technology & Management-Navi Mumbai(ITM)
35. NIILM Centre for Management Studies, B-II/66, Sher Shah Suri Marg MCIE, Mathura Road, New Delhi-110044
36. PSG Institute of Management, PB No. 1668, Peelamedu, Coimbatore - 4.
37. Amrita School of Business, Amrita Vishwa Vidyapeetham, Ettimadai, Coimbatore-641105.
38. Faculty of Management Studies-Varanasi
39. Jaipuria Institute of Management, A-32A, Sector 62, NOIDA-201301
40. Institute of Management Studies-Ghaziabad(IMS)
41. St. Joseph's College of Business Administration, 18, F.M. Cariappa Road, Bangalore – 560025
42. Regional College of Management, Chandrasekarpur, Bhubaneswar-751023
43. Mount Carmel Institute of Management, PG Centre, 58, Palace Road, Bangalore - 560052.
44. N L Dalmia Institute of Management Studies and Research, Sector I, Srishti Complex, Mira Road(East), Mumbai-401104
45. School of Communication and Management Studies, Prathap Nagar, Muttom, Alwaye, Cochin – 683106
46. Punjab College of Technical Education-Ludhiana(PCTE), Ferozepur Road, Baddowal, Ludhiana-142021
47. Institute of Productivity & Management, Delhi-Meerut Road, Near Old I.T.I, Duhai, Ghaziabad, UP- 201206
48. Gitam Institute of Foreign Trade, Gandhinagar Campus, Rushikonda Visakhapatnam-530045.
49. SDM Institute for Management Development, Site No. 1, Chamundi Hill Road, Siddarthanagar Post, Mysore-570011
50. MIT School of Management- Pune

CHALLENGES BEFORE BUSINESS EDUCATION IN INDIA

MAJOR CHALLENGES

The Indian economy has witnessed remarkable changes in the post liberalization period posing new challenges to almost every sector. Educational sector is no exception to this. The major challenges before business education in the coming era of 21st century would be:

- Competition
- International Perspective
- Information Technology
- Placement
- Quality and Academic Standards
- Industry-Institution Interface
- Image-Building

- Knowledge Management
- Autonomy

Business in India is yet to achieve the size and degree of sophistication it has attained in developed countries. The Indian management is hardly professionalized. What we see is only patrimonial management in private sector. A coterie of families controls important segments of industries. Even in the case of public sector undertakings the pattern of management is bureaucratic and even may be regarded as proprietary in the sense that the civil servants are usually deputed to manage such undertakings and Government or the Parliament is in a position to influence their policies and working. Sometimes the persons having political connections are also asked to head such undertakings. Under such condition it must be said that if Indian business is to prosper and meet the challenges brought about by the changing environments, the process of professionalism of management has to be effectively geared up, because technology and size have brought about a number of complexities in business management. Modern management must be able to adjust itself to the fluctuations of the market, actions of competitors, labour unions, Government relationships and many other factors of external environment. The changing technology calls for improved managerial practices. Professional managers are needed in the context of increasing requirements of cutting down cost, improving expert performance and in general help to raise the levels of national output. Our business education, therefore, must produce not only competent managerial personnel but also develop new systems of management by continuous research in the higher institutes of learning like the universities, professional bodies, industrial units and government agencies. Business or management education must accept the challenges thrown in the wake of globalization and liberalization and produce young men and women for shouldering the task of nation building. It is in this background that the objectives of management education should be framed, organized, interpreted and evaluated.

As a professional preparation discipline, business education should reinforce the business practices of the society by advanced research, by exploring the possibilities of introducing new business and managerial tools and techniques without blindly adopting the highly sophisticated tools of management practiced by advanced countries. The professional managers have to develop the tools of analysis capable of application and adaptation in the changing business environment. Management education has entered a period of profound transition driven by globalization, technology, demographics, and pressing social imperatives. In fact increasing economic integration will have several important implications for management education. Integration and job growth in market economies will increase the demand for management education, as previous experience has shown that skilled, better educated workers have the most to gain from globalization.

It is also appropriate to think about these demand increases as driven by market imperatives and purposeful investments, rather than just as a consequence of globalization. Education and training are key drivers of economic competitiveness. Countries must invest in developing human capital, creating new knowledge, and spurring innovation- all crucial roles for higher education in general. Management education, in particular, is viewed as essential because in market economies, management and entrepreneurial talent create, finance, and grow the demand for knowledge and innovation. While there is no need for a formal MBA for micro- enterprises, certainly there is considerable need for knowledge of sound business practices. The IIMs in India could form strategic collaborations with the business schools in the rural areas, in the small cities, and those focused on women and other such groups; and offer various forms of support to these local institutions. In fact the business schools in developing countries must be more engaged in the global community to share best practices and to facilitate collaboration. Similarly, business schools must meet the challenge to deliver management education and knowledge that is relevant in both global and local settings.

Modern management must be able to adjust itself to the fluctuations of the market, actions of competitors, labour unions, Government relationships and many other factors of external environment. The changing technology calls for improved managerial practices. Professional managers are needed in the context of increasing requirements of cutting down cost, improving expert performance and in general help to raise the levels of national output. Business or management education must accept the challenges thrown in the wake of globalization and liberalization and produce young men and women for shouldering the task of nation building. It is in this background that the objectives of management education should be framed, organized, Interpreted and evaluated.

CONCLUSION AND SUGGESTIONS

Business education should reinforce the business practices of the society by advanced research, by exploring the possibilities of introducing new business and managerial tools and techniques without blindly adopting the highly sophisticated tools of management practiced by advanced countries. The professional managers have to develop the tools of analysis capable of application and adaptation in the changing business environment.

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MULTI-CORE PROGRAMMING PERFORMANCE AND ANALYZES

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ABSTRACT

The research intended to find performance issue on the architecture hardware as well as software prospective boosting up the processors speed is only not the issues but Speedup has been achieved by increasing clock speeds and, more recently, adding multiple processing cores to the same chip. The major Processor manufacturer from Intel , AMD & All leading Processor Manufacturer are boosting CPU Performance from last 20 years to till Date how the change take place not only in processor but also in software development the turning point it seem changing face of hardware too. It suddenly does matter to software, the concurrency revolution will also change the way of writing software in the future. The revolution in software development from structured programming to object oriented Programming is change in the past 30 years. The people are doing Object oriented Programming in simula, JAVA to solve larger Problems for Larger system and writing the program for economical, reliable and repeatable. Using Multi-core architecture and making Multi-core Programming (Parallel Programming) which we can make the difference in sequential as well as parallel programming.

KEYWORDS

Process, thread, Multithread, Multitasking, Multi-core, Multi-core Programming, Parallel Program.

INTRODUCTION

Many applications are written as single threaded program capable of handling only one task at a time, so as not able to take advantage of the technology found in today's multi-core hardware. This application can be requirement for ordered processing, which needs to be rewritten to enable them to handle multi-core hardware.

A thread is discrete sequence of related instruction that is executed independently of the other instruction sequences. Every program has at least one thread the main thread that initializes the program and begins executing the initial instructions. That thread can then create other threads that perform various tasks, or it can create no new threads and simply do all the work itself. In either case, every program has at least one thread.

Each thread maintains its current machine state. On a single processor, multithreading generally occurs by time-division multiplexing (as in multitasking): the processor switches between different threads. This context switching generally happens frequently enough that the user perceives the threads or tasks as running at the same time. To define a thread, only the architecture state required. A logical processor can thus be created by duplicating this architecture space. The execution resources are then shared among the different logical processor can thus created by duplicating this architecture space. The execution resources are then shared among the different logical processors. This technique is known as Simultaneous Multithreading

SMT, Intel's Implementation of SMT is known as Hyper-threading Technology or HT Technology. HT Technology makes a single processor appear, from software's prospective, as multiple logical processors. This allows operating systems and applications to schedule multiple threads to logical processor as they would on multiprocessor systems.

In other words, multiple threads can scheduled, but since the execution resources are shared, its up to the micro-architecture to determine how and when to interleave the execution of the two threads. When one thread stalls another thread is allowed to make progress. These stall events including handing misses and branch mispredictions.

Hyper-threading is about running two or more threads in parallel inside a single CPU. A limiting factor, however, is that although a hyper-threading CPU has some extra hardware including extra register, still it has just one cache Hyper-threading is sometimes cited as offering a 5% to 15% performance boosted. For carefully written multi-threaded application But it doesn't help single threaded application. To overcome all such problem, the hardware industry moved in direction where more than one chip can be embedded on a single die with the same space where previously one core used to be.

The major CPU vendors have shifted gears away from ramping up clock speeds to adding parallelism support on-chip with multi-core processors.

The processor architecture and micro-architecture are undergoing a vigorous shaking-up. The major chip manufacturers have shifted their focus to "multi-core" processors. Optimal application performance on multi-core architecture will be achieved by effectively using threads to partition software workloads. Many applications today use threads as a tool to improve user responsive on single-core platforms. But the performance is boosted only when the application is well-written in multi-threaded.

The terms "Concurrent computing", "Parallel computing", and "distributed computing" have a lot of overlap. And no clear distinction exists between them. The same system may be characterized both as "parallel" and "distributed".

The processors in typical distributed systems run concurrently in parallel. Parallel computing may be seen as a particular tightly-coupled form of distributed computing, and distributed computing may seen as a loosely-couple form of parallel computing. Possibly to roughly classify concurrent systems are "parallel" or

"distributed" using the following criteria. Parallel computing, all processors have access to shared memory. Shared memory can be used to exchange information between processors. In distributed computing, each processor has its own private memory (Distributed memory)

The key issue in programming distributed memory systems is how to distribute the data over the memories. The data can be distributed statically, or it can be moved through the nodes. Data can be moved on demand, or data can be pushed to the new nodes in advance.

Because each processor has its own local memory, it operates independently. Changes it makes to its local memory have no effect on the memory of other processors. Hence, the concept of cache coherency does not apply.

When a processor needs access to data in another processor, it is usually the task of the programmer to explicitly define how and when data is communicated. Synchronization between tasks is likewise the programmer's responsibility.

Advantage is Memory is scalable with number of processors. Increase the number of processors and the size of memory increases proportionately.

Disadvantage is that programmer is responsible for many of the details associated with data communication between processors.

Concurrency is the next major revolution in how we write software. Applications will increasingly need to be concurrent if they want to fully exploit CPU throughput gains that have now started becoming available and will continue to materialize over the next several years.

Intel is talking about someday producing 100-core chips a single-threaded application can exploit at most 1/100 of such a chip's potential throughput.

Multi-core Programming is nothing but the parallel Programming In parallel programming, single tasks are split into a number of subtasks that can be computed relatively independently and then aggregated to form a single coherent solution. Parallel programming techniques can benefit from multiple cores directly.

During our experiment work following are the tools used in our experiment.

- **OpenMP**
- **VTune**
- **Thread Checker**

OpenMP

OpenMP (Open Multi-Processing) is an application programming interface (API) that supports multi-platform shared memory multiprocessing programming in C, C++ and FORTRAN on many architectures, including Unix and Microsoft Windows platforms.

It consists of a set of compiler directives, library routines, and environment variables that influence run-time behavior. OpenMP is an implementation of multithreading, a method of parallelization whereby the master "thread" (a series of instructions executed consecutively) "forks" a specified number of slave "threads" and a task is divided among them.

The threads then run concurrently, with the runtime environment allocating threads to different processors.

VTune

Intel VTune Performance analyzer is a commercial application for software performance analysis for x86 and x64 based machines, and has both GUI and command line interfaces. It is available for both Linux and Microsoft Windows operating systems.

Features of VTune performance analyzer

- **Call graph**
- Provides a graphical view of the flow of an application, and helps to identify critical functions and timing details in the applications.
- **Time-based and Event based sampling**
- Time-based sampling finds program "hot spots" that consume a lot of CPU time.
- **Source view**
- Sampling results are displayed line by line on the source / assembly code.
- **Counter monitor**
- Provides system level performance information, such as resource consumption during the execution of an application
- **Intel Thread Profiler**
- A timeline view shows what threads are doing and how they interact. It shows the distribution of work to threads and locates load imbalances

Thread Checker

Intel® Thread Checker is an analysis tool that pinpoints hard-to-find threading errors like data races and deadlocks in 32-bit and 64-bit applications. Develop multi-threaded applications faster and with less effort and get more performance from multi-core. Intel® Threading Tools make it easier to create multithreaded applications that take advantage of the performance benefits of Hyper-Threading Technology Many applications are written as single threaded program capable of handling only one task at a time, so as not able to take advantage of the technology found in today's multi-core hardware. This application can be requirement for ordered processing, which needs to be rewritten to enable them to handle multi-core hardware.

Rewriting such application needs certain things to consider because.

- The programming model changes: sequential (with optimization) to parallel
- The memory model changes shared (SMP) to non shared (many core)
- The portability & scalability issue arises like insufficient parallel work, synchronization overhead, contention, load balance, task granularity etc.

In our work we have tried to see these issues, how they can be overcome and main work which we tried was to parallelize the program through multithreading and analyzed the result which were on two different mode.

In first mode we run the program in the general environment with sequential mode while in second mode we went through parallelizing the program.

The tools which we have use is openMP, Vtune and thread checker We found performance gains in many applications one of a main program which we considered for experiment is calculation of PI (using Monte Carlo) which showed 75% gain in time over its sequential counterpart. But many of the Programs which we did while working and for understanding the concepts we came up will performance degradation, due to parallelization on computation time.

Our main analysis after working on parallel program is that a proper understanding design, distribution and control over the environment to realize the benefits.

EXPERIMENTAL RESULT FOR SEQUENTIAL OUTPUT

Sr.No	OS	Processor	PI Value	Execution Time in Sec
1	XP	Dual Core	3.141592653590	54.437000 seconds
				9.8400000 seconds
2	Vista	Dual Core		6.8440000 seconds
3	XP	Core2Duo		6.582000 seconds
				6.734000 seconds
				6.844000 seconds
				6.843000 seconds

EXPERIMENTAL RESULT FOR PARALLEL OUTPUT

Sr.No	OS	Processor	PI Value	Execution Time in Sec
1	XP	Dual Core	3.141592653590	18.500000 seconds
2	Vista	Dual Core		3.640000 seconds 3.485000 seconds 3.500000 seconds 3.515000 seconds
3	XP	Core2Duo		3.454000 seconds 3.360000 seconds 3.750000 seconds

CONCLUSION

- Application are generally written as single threaded program running one task at a time as not able to take advantage of the technology found in today's multi-core hardware.
- To write program to achieve the capability of running & gaining the power of all the cores. Needs ordered processing and rewriting of the program.
- Rewriting major things to be considered were the scalability issues like insufficient parallel were improper load balancing, synchronization overhead contention, and task granularity.
- While carrying out the experiment we worked in two modes.
    - Sequential
    - parallel
- Major times we have found that there was performance gain one of our program was calculation of PI using Monte carlo method which showed 75% gain in time over its sequential counter part.
- But there were situation where the programs runs in parallel mode showed performance degradation over the sequential one.
- With all this experiments our main aim was to find out the major hotspots in the parallel program which when resolved leads to performance gain.
- In future work we will try to resolve the load balancing, and will try to go more to system specification while creating and synchronization & our major focus will be on implementing ANN on Multi-core system

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STUDY ON STREET LIGHTS EXECUTION USING SIMULATION MODEL WITH EXCLUSIVE FOCUS ON ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS

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ABSTRACT

Distribution Generation capacity and Network Expansion planning is a basic part of power network planning that determines where, when and how many new transmission should be added to the network. Distribution generation capacity is required for adequate performance of a distribution system. In this paper we present the reasons for studying Artificial intelligence (AI) and Neural networks (NN) for which they have used for distributed generation capacity and network expansion planning. Here will take intelligent streets of AI and NN where street lights will switch on and switch off according to the sunlight heat and rays with the help of various sensors and learning algorithms to implement this system. Sensors detect the temperature of heat and rays within each street of the premises. Back propagation algorithm is used to train the data samples in the knowledge database and check whether hidden layers or synaptic weights are giving exact output for inputs. Based on Monte Carlo simulation and Mat lab tool, a methodology has been developed to evaluate the switch on and switch off lights. Acquiring an input from sensors such as temperature, sun rays as inputs and matching with weights available in existing database or memory chip, for matching we are using pattern matching algorithm.

KEYWORDS
Artificial Intelligence, pattern matching, neural networks, sensors, Back propagation algorithm, Monte Carlo simulation.

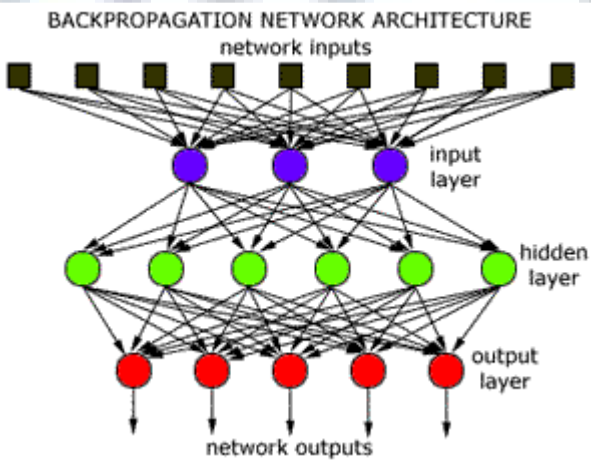
1. INTRODUCTION

Transmission network expansion planning and distributed generation is an important component of power system planning. Lights will be switch on and switch off according to the sunlight heat and rays. Heat and rays is read or observed by an input sensing device such as temperature sensors and light sensors. It sense or detect the temperature and light in the premises of the street poles. Light is measured through a photo resistive device (ORP 12) connected to a simple amplifier for level adjustment and impedance reduction through light sensors [5]. Temperature is measured through a heat system in OC through temperature sensors. For every random DG street sub stations we are using Automatic microprocessor control (AMC) carries out functions in a reactive way i.e. it responds to environmental conditions. The behavior of the AMC is controlled by a set of rules, but the way that rules are applied can be modified by high level commands. Lighting the streets without the help of manpower. So that we can switch on and off the lights according to the sun rise and sun set. By the method we can save power, time and cost. If person is not in time to switch on and switch off. This system will automatically on the light and off also.

2. BACK PROPAGATION ALGORITHM

Light switch on and off has been using sensor inputs to train a neural network via Back propagation [2]. A typical neural network has N inputs and one or more output as shown in Fig 1. The input layer is composed not of full neurons, but rather consists simply of the values in a data record, that constitutes inputs to the next layer of neurons. The next layer is called a hidden layer and there may be several hidden layers. The final layer is the output layer, where there is one node for each class. A single sweep forward through the network results in the assignment of a value to each output node and the record is assigned to which ever class node had the highest value. These actual inputs are fed into the network as the inputs. This approach works great when trying to detect or sense the input in the form of temperature or light with fixed orientation and scale. However at different scale and orientation, it doesn't give encouraging results. Therefore tokens of an input used during training, the network are trained; it identifies the input pattern and tries to output the associated output pattern. It must calculate how the error changes as each weight is increased or decreased slightly. The back propagation algorithm is the most widely used method for determining the EW. The power of neural networks is realized when a pattern of inputs, during testing, is given as an input and it identifies the matching pattern it has already trained in memory.

FIG 1



3. SENSORS

A sensor is a converter that measures a physical quantity and converts it into a signal which can be read by an observer or by an instrument. A thermocouple converts temperature to an output voltage which can be read by a voltmeter. In this paper we are using temperature sensor premises are measured by the system. Clearly they each have value in providing information for a control system but they also provide valuable contextual information for learning. Temperature is available to the system in ^{o}C. The central heating control has direct control of the central heating system. Control is made through a simple solid state device. The system is therefore able to make different sorts of control options available, other than simple temperature of time based control. Electricity sensor is senses the amount of electricity used by the streets or premises (in watts) is made available to the system every few seconds. This sensor is implemented by employing a current transformer on the main electricity feed that has a fixed low resistance stable resistor as its load. The voltage across this load is available to the system via a simple amplifier used for level adjustment. The value available is adjusted to a reading in watts through the use of constant. The system is able to detect the effect of some of its control operations using this measurement. Light sensor the light is measured in the streets or premises. The system uses constants to infer the light levels in different places. Ideally, each street has its own light level sensor. Light is measured through a photo resistive device (ORP12) connected to a simple amplifier for level adjustment and impedance reduction. This has been no attempt to recognized units of light level as an output. The sensor simple supplies a reading between o and 255 that is indicative of the ambient level. Automatic microprocessor controller (AMC) carries out functions in a reactive way. i.e. it responds to environmental conditions. The behavior of the AMC is controlled by a set of rules, but the way that rules are applied can be modified by high level commands. Lamps the system is allowed to have direct control over several lamps in the premises or streets. Other than in an emergency, the system is the only controller of these lamps. It was felt that some lamps would be unsuitable for system control because of the weather conditions may want light on or off at times. Lamps in areas control is made through simple solid state devices.

4. PROPOSED SCHEME

Block diagram of street lamps with sensors, microprocessor controller, lamps, and power lines of wires. In this fig.2 we are using sensors to detect or read an input from sun. By reading an input the sensors will get an activate according to the situation if it is sunrise the lamps will get switch off. If it is sunset lamps will switch on. In sunrise temperature, heat, light will increase at certain level sensors will detect or observe the premises or streets then the electricity will play a key role to inform to AMC with an exact input. This input will learn with back propagation to get exact output from trained samples. Then the pattern checker or matcher will give as input for Automatic Microprocessor controller (AMC) whether lamp should switch off or switch on.

PERFORMANCE EVALUATION

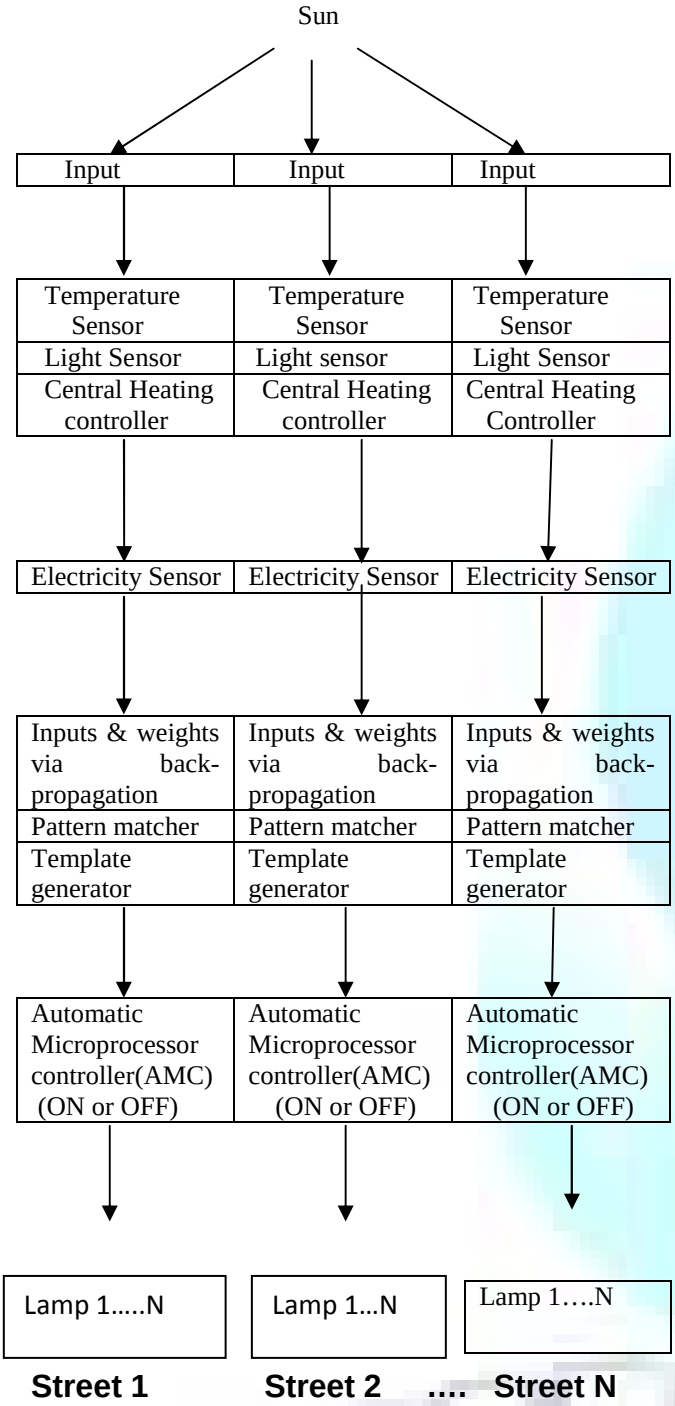
Step 1: Observe an input from sun through light sensor or central heating controller, temperature sensor for switch off or switch on the street lamps.

Step 2: Electricity sensor will take an input from above level sensors whether electricity should be flow or not to below levels.

Step 3: Once the Inputs are passed from step1, step2 to back propagation algorithm it will calculate the input with already trained weight samples to get exact output. If any error in the output these algorithm will recalculate or adjust the trained weights to optimize or minimize the error by giving new weights to system (AMC).

Initialize the weights in the network or sensors (often randomly)
Do
For each example ‘e’ in the training set
O= neural-net-output (network or sensors, e);
Forward pass
T= teacher output for e
Calculate error (T-0) at the output units
Compute delta _Wh for all weights from hidden layer
to output layer; backward pass
Compute delta_Wi for all weights from input layer to hidden layer; backward pass continued
Update the weights in the network or sensors until all examples classified correctly or stopping criterion satisfied
Return the Network or Sensors

Step 4: Pattern matcher or checker will give an input from Back propagation after matching to AMC to switch on or off the lamps in the streets.



5. TESTING AND RESULTS

Using Monte Carlo simulation model on AI and NN has been considered. The sensors signals input street each substation has been assumed as uniform, as given below:

F (S1) = 1/1.3 0.5 <S1<1.8

F (S2) = 1/1.3 0.5 <S2<1.8

Three DG street substations have been considered in this paper to switch off or on the lamps according to the temperature sensor, light sensor, central heating controller in table 1.

TABLE 1: WEIGHTS OF TRAINED BACK PROPAGATION ALGORITHM FOR REPRESENTING SWITCH ON AND OFF

S.I No (i)	1	2	3
W_i	-6.392978	0.288482	-0.288075
ΔW_i	4.000000	-2.773707	5.022678

Initially, the back propagation algorithm was trained with n=3 neurons in the hidden layer. The weights W_1-W_3 and ΔW_1- ΔW_2 of the ANN are given in table 1.

TABLE 2: VALIDATION OF TRAINED BACK PROPAGATION ALGORITHM

		TIME (%)		
S.I No	Sun input	Obtained from Light sensor (t_g)	Obtained From Light sensor (t_g)	Error (%) (t_g-t_a) **x** 100/t_g
1	0.50	1.00000	1.001279	-0.127
2	0.60	0.88330	0.872775	1.191
3	0.65	0.83350	0.822148	1.362

$S_{1,I} = 1.3\ N_1 + 0.5$
$S_{2,I} = 0.3\ N_2 + 0.2$
To represent the status of each DG; 4 random digits N_3 and N_4 were used and the status was decided based on the following:
$0<=N_3<=0.78$ DG-1 street is in ON (N) state
$0.78<=N_3<=1.0$ DG-1 street is in OFF (F) state
$0<=N_4<=0.81$ DG-2 street is in ON (N) state
$0.81<=N_4<=1.0$ DG-2 street is in OFF (F) state
For each sample, the DG is calculated streets. Status of the states will change according to input.

7. CONCLUSION

It is very challenging task for AMC to switch on or off the lamps according to the environmental conditions. Although Existed systems are running by solar systems for switch on or off for street lamps. In our proposed scheme running with flow of Electricity and sensors, controllers. It is difficult to implement this system. Still there is a possible where we can implement this kind of system. Because all over the world we are using complete electronic devices and advance technology methods. In this scheme going with Back propagation algorithm were you can easily solve errors in this system by adjusting weights or updating weights from trained samples to get exact output. Major purpose of this paper In South Asian countries the electricity is a major problem by this research idea at least minimizing the wastage of power in the street lamps depending upon human power. The person should come to switch on and switch off the lamps on time (morning and evening) he have to cover enter streets in mean time. Cost factor will play a key role in this research idea.

8. REFERENCES

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EFFICIENT VIDEO TRANSMISSION FOR WIRELESS COMMUNICATION NETWORKS USING ZIGBEE PROTOCOL

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ABSTRACT

The rapid growth of digital communication systems causes higher traffic in proliferating wireless networks that causes the need to get higher end videos for communication. The transmission of videos in wireless networks experiences intolerable delays that lead to inconsistent perception of videos. To overcome the above stated problem the efficient zigbee protocol (IEEE 802.15.4) is used efficiently. Consequently it provides a low bit rate and low cost communications for short distances respectively. First a method is proposed in which, the variable delays (i.e. jitter) can be reduced, by virtuously lowering the resolution of video frames from a complete video sequence. The video frames are then mixed with high resolution and low resolution frames of a sequential video. It therefore involves the efficient usage of existing bandwidths which is adopted by the behaviour of 4G networks. A further advancement hereinafter uses cryptographic techniques to provide security to the transmitted video effectively. It involves the encryption mechanism done using elliptic curve cryptography to accomplish a secure video transmission over the WPAN (wireless personal area network) network. The final aim is to show experimental results that prove the achievement of better PSNR (peek-to-peek signal to noise ratio) and VQM (video quality metric) values for enhanced video perception.

KEYWORDS
Internet Protocol (IP) Packet Delay Variation (IPDV) measurement, Wireless Networks, Mean Square Error (MSE), Video Streaming.

1. INTRODUCTION

In the current trends, wireless communication networks based on the International Organization for Standardization/Open Systems Interconnection (ISO/OSI) layers are widely used worldwide in many applications such as colleges, factories, industries, research fields and university campuses. They help in providing a wired access to the network or Internet connections for the home personal computers (PCs), Laptops, and other electronic connectivity devices. The proper working of these applications involve social, medical, manufacturing, scientific and financial [1].

In Some applications the traditional conception of communication networks involves features that are similar to the computing environment. In this scenario, the conjecture is to find the difference between the communicating networks environment and the computer networks environment because of the typical use of communication network such as video broadcasting, television broadcasting (TV), conferencing of video calls, telesurgery and many more. Communication in networks is either wired or wireless for any transmission of data. The data which is transmitted can be any of the following forms: signals, text, image, voice and video. The association of IEEE mainly defines the physical (PHY) and medium access control (MAC) layers for the communication in wireless channels such as 10-100 meters [2].

On the other hand the usage of these services for transmitting the data over proliferating wireless networks causes a higher cost for communication. To meet the requirements of the above stated problem, a low cost and low bit rate zigbee protocol is used. This protocol is stated internationally as IEEE 802.15.4 which is mainly used for the short distance communications. The Efficient zigbee protocol has been very much useful in reducing the cost of communication and helps providing a low bit rate for the transmission of videos is vital. Since humans are the excellent way for the interaction of images/videos the renowned psychometric tests were conducted on humans, which lead to the invention of the JPEG (Joint Photographic Experts Group) algorithm for image compression. JPEG is an ISO/IEC group of experts that develops and maintains standards for a suite of compression algorithms for computer image files.

In this framework, Delay, Latency, Jitter, packet loss and compromised data throughput along with round-trip times are often realized on the Internet protocol (IP) networks will lead to voice and video quality degradation. Consequently an appropriate solution is to be provided to overcome the inconsistent perception of videos by users. In the same way the measurement of delay and jitter plays a fundamental issue which is to be recognized. Specifically, this measurement activity involves the evaluation of the following metrics: throughput, available bandwidth, delay measurements, one-way delay, round-trip delay, variable delay (jitter), and packet loss. These metrics that are related directly to the perception of video-streaming services have been studied. Consequently, these metrics are evaluated at the application layer of the ISO/OSI protocol stack, which requires the comparison of the originally transmitted video and the received one.

2. PRELIMINARY NOTES

Considering the literature studies that are able to study the video quality perceived by the users takes into account the classification of two main categories: subjective tests, in which case the humans are allowed to view, perceive and assess the data (i.e. video) and objective tests, which are completely involved in analyzing and measuring the computational models of the original video and the distorted video sequences [3]. Some of the objective quality metrics which are mentioned in the literature survey reveals that the undistorted or undamaged video signal is fully available. This is called as full-reference (FR) video quality assessment. In practical the reference images or video sequences are quite often not easily perceptible. Hence the measurement approaches for image or video quality are somewhat blind. This blind or no-reference assessment of images or video quality sequences are highly difficult for the humans, as they play an important role in the assessment of the distorted image or videos without using any reference. Another type of the video quality assessment is the reduced-reference video quality assessment in which certain features are extracted from the original signal and then transmitted to the video quality assessment procedure as partial information for the analysis of the distorted video signals [3].

Recently, the most widely used FR objective video distortion/quality metrics are *peek-to-peek signal-to-noise ratio* (PSNR) and *video quality metric* (VQM); consequently these are the factors that are considered here.

The metric used in the computation of the image and video processing is reliable and efficient to compute. This metric is the most popularly used for image and video quality assessment. It measures the image fidelity using the following relation:

$$PSNR = 10.\ Log_{10} \frac{MaxErr^2}{MSE} \quad (1)$$

where MaxErr is the maximum possible absolute value of the color component difference. Simultaneously, MSE is the *mean square error* and can be calculated using the relation:

$$MSE = \frac{1}{w\ .\ h} \sum_{i=1}^{w} \sum_{j=1}^{h} (x_{i,j} - y_{i,j})^2 \quad (2)$$

where w and h are video width and height, respectively, and the corresponding $x_{i,j}$ and $y_{i,j}$ are the pixels in positions i and j of the original received video. However the measurement of MSE does not correlate with the human perception of quality as discussed in [3].

In literature work, the algorithm for the VQM has been mentioned. It provides the analysis of video quality with the help of two input video streams: the original video, which is taken as reference, and the one that is displayed efficiently, which is to be analyzed. The algorithm is based on the *discrete cosine transform* (DCT) [4]. It applies an 8x8 DCT transform to the reference video frame and the corresponding received video frame, respectively. Its objective is to separate the incoming frames into unique spatial frequency components. It later measures the local contrast and converts them in *just-noticeable differences* which apply temporal *contrast sensitivity function* (CSF) filtering. Consequently, the CSF computes the variation of the sensitivity of the *human visual system* (HVS) to distinct spatial and temporal frequencies that are available in the visual stimulus [5].

As mentioned above, the efficient VQMs are mostly evaluated at the application layer of the ISO/OSI protocol stack and imply the requirement of the original transmitted video to be available. On the other hand, in [6], it has been stated that *Quality of Service* (QoS) indexes, especially IPDV, affects the performance of video-streaming services. Additionally, these QoS indexes mentioned above can also be computed at the network layer of the ISO/OSI protocol stack. Thus the relationship between a quality related to the IPDV and the evaluated VQMs are found to be correct. Furthermore, the analysis of the metrics at the network layer and the inconsistent information of the originally transmitted video could be vanquished [7]. This estimator plays a major role for the technicians, to use the video streaming resources efficiently in a WAN network. Next session deals with the proposed work and conclusion.

3. PROPOSED WORK

With regards to the above discussed QoS measurements in compliance with the IPDV estimators, the efficient video-streaming services have been considered in this paper. It includes the consideration of the work is split up into Text Transfer method, Image Transfer method, Video Transfer method, Reduced Resolution Video Transmission, Encryption using Elliptic Curve Cryptography and finally Measurement Analysis. These are explained in the forthcoming sessions respectively.

A. TEXT TRANSMISSION

The transmission of text messages in the real time scenario plays a major role in wireless communications. Eventually, it states that the text which is transmitted travels either in wired or wireless networks. But this paper concentrates mainly on the wireless mode of transmission. The transmission and reception of the text data via internet avails the facility of a certain type of protocol in the network. For this purpose, the efficient zigbee protocol (IEEE 802.15.4) is used here. The relationship between IEEE 802.15.4 and Zigbee is in accordance between IEEE 802.11 and the Wi-Fi Alliance technology. Zigbee is a specification for a suite of high level communication protocols using small, low cost, low bit rate, low-power digital radios for wireless personal area networks (WPAN). The technology implied by the zigbee protocol mechanism is simpler and less expensive compared to other WPANs, such as Bluetooth mechanisms.

B. IMAGE TRANSMISSION

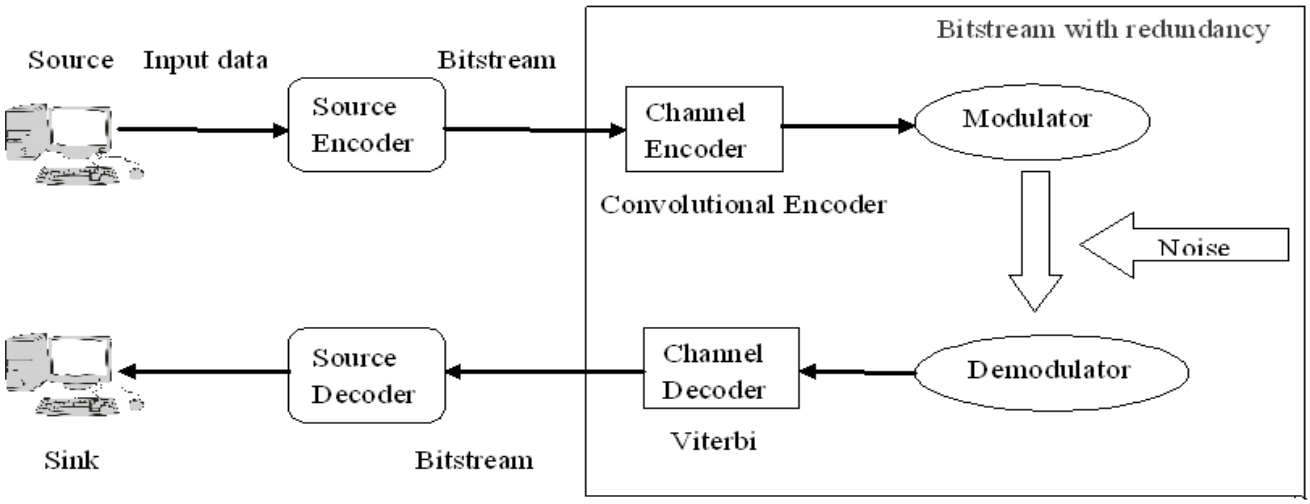
Subsequently, images are also considered as input for the transmission of messages over the wireless media. Since the size of the image is somewhat larger than the text data, the resizing of the image is required to be implemented. This technique specifies the reshaping of the input message (i.e., image) to fit into the corresponding input data format. The difference between the text and the image data is the size of the file which differs in only a few kilobytes (KB) of memory storage. According to the scientists, humans perceive more information from images rather than the text data in real world applications. The format of the images can be jpeg, jpg, gif, tif, png, dicom, and bmp can be provided as input data for wireless communication.

C. VIDEO TRANSMISSION

Consequently, the real time videos along with its features are also transmitted in the wireless network for communication. The technology used for online video transmission is video-streaming services. These services typically include the basic features of the video and its associated properties. Various tests are conducted by emulating a real time video-streaming service from source to the end user.

In this paper, a short term video is transmitted from the source to destination via a wireless channel.

FIGURE-1: SIMPLIFIED MODEL OF PROPOSED WORK



Source: The source output data is based on the input information such as the output of a digital communication machine.

The architecture of the proposed work has the source encoder block which accepts the input data information in the form of text, image, and video respectively.

Source Encoder: The mechanism of converting the output of either an analog or digital source message into a sequence of binary digits is called source encoding or data compression.

Channel Encoder: The sequence of binary digits information from the source encoder block, which is often referred to as the information sequence, is transmitted to the channel encoder block in the simplified model. The main goal of the channel encoder is to present, the binary information sequence with

some amount of information in an controlled manner that can be used at the receiver to overcome the effects of noise and interference encountered in the transmission of the signal via wireless channels. Hence, the introduced redundancy values serves with greater reliability of the received data and improves the fidelity of the received output signal information. Accordingly, the redundant information sequence message aids the receiver in decoding the desired information sequence.

Modulator: The binary sequence at the output of the channel encoder is given to the digital modulation block, which acts as the interface to the wireless communication channels. Since nearly all of the communication channels encountered in practice are capable of transmitting electrical signals (waveforms), the primary purpose of the digital modulator is to map the binary information sequence into signal waveforms.

Channel: The communication channel is the physical medium that is used to send the signal from source to the destination. In wireless communication environment, the channel used can be the atmosphere (free space or air). Furthermore, telephone communication medium, personal computers (PCs) and laptops usually employ a variety of physical media, including wired links, optical fibers, and wireless (microwave radio, Bluetooth, etc.,). Whatever the physical medium used for transmission of the data for communication, the necessary property is that the transferred signal is corrupted in a random manner by a variety of possible mechanisms, such as the additive thermal noise generated by digital electronic devices, human noise, e.g., vehicle engine noise, Environmental noise, e.g., noise during thunderstorms.

Demodulator: At the receiving end of a digital communication system, the digital demodulator processes the channel-corrupted transmitted waveform and reduces the waveforms to a sequence of numbers that represent estimates of the transferred data blocks. The corresponding sequence of data is given to the channel decoder respectively.

Channel Decoder: The channel decoder attempts to reconstruct the original information sequence from knowledge of the code used by the channel encoder and the redundancy contained in the received data. This is where the error correcting Convolutional codes are applied like the hard decision or the soft decision Viterbi decoding algorithm, Maximum A Posteriori decoding algorithm (MAP) and so on.

A measure of how well the demodulator and decoder performs is the frequency with which errors occur in the decoded sequence. More precisely, the average possibility of a bit-error at the output of the decoder is a measure of the performance of the demodulator-decoder combination. In general, the probability of error occurrence is a function of the code characteristics and properties, the different type of waveforms (signals) used for the transmission of information over the wireless channel, the amount of power transmission, the unique characteristics of the medium, i.e., the total value of noise, the nature of the interference mechanism, etc., and the system of demodulation and decoding.

Source Decoder: As a final step when an analog output sequence is considered, the source decoding block accepts the output sequence data from the channel decoding block and, from the knowledge of the source encoding sequence methodology and attempts to reconstruct the original signal from the source. Due to the channel decoding errors and possible distortion introduced by the source encoder block and hence, the source decoding block, the signal occurring at the output of the source decoder is an approximation to the original source output sequence. The difference function between the original signal and the reconstructed signal is a measure of the distortion introduced by the digital communication system.

Sink: The sink is the final received information sequence, the transmitted input which may be text, image, audio or a video. Thus the final information sequence is obtained.

D. REDUCED RESOLUTION VIDEO TRANSMISSION

In general, a video is a collection of frame sequences. When a video is transmitted across the internet its features along with the frames are also transmitted. While transmitting a high resolution video via wireless channel certain type of delay occurs in the communication link. This turns out to be a problem for video-streaming services. The occurrence of delay are due to the factors such as rain, storm, power cut, less memory space available at the receiving end and traffic in the network. To overcome this problem, a technique called reduced resolution video transmission is used here. It involves the mixing of the video frames with low resolution and high resolution frames in a complete video sequence. Afterwards, the obtained video is transmitted across the internet to the corresponding receiver. The system is unicast and describes the transmission from single sender to a single receiver. Thus, this technique reduces the transmission delay and aids perceptible videos for users.

E. ENCRYPTION USING ELLIPTIC CURVE CRYPTOGRAPHY

Security constraints are significant at present scenario in the real world applications. To ensure a secure video transmission the services of cryptographic techniques are used here. It involves the usage of the Elliptic Curve Cryptography (ECC) method which revolves around public-key cryptographic techniques. The performance criteria are based on the algebraic structure of the elliptic curves over finite fields. The input data is first encrypted for security purposes and then transmitted to the receiving end user where decryption takes place. Hence, the overall system is secured.

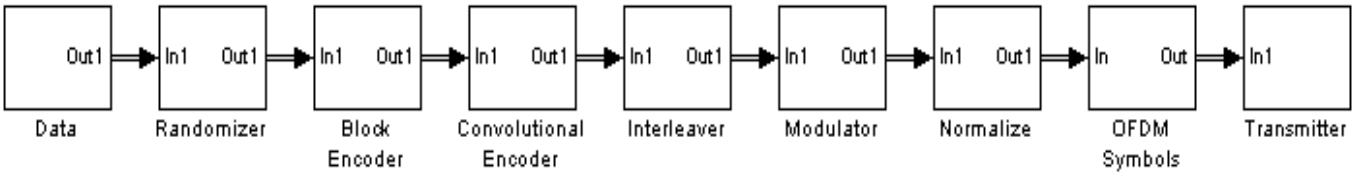
F. MEASUREMENT ANALYSIS

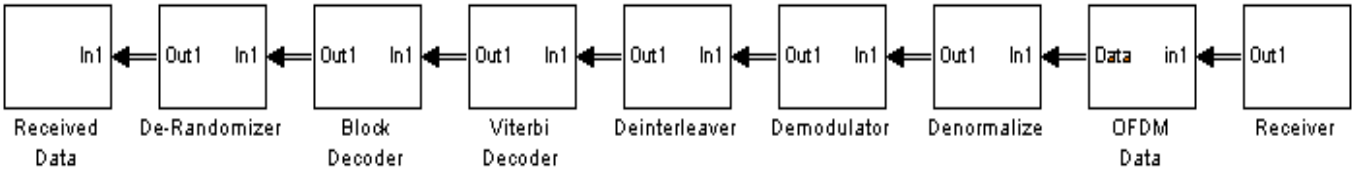
The overall performance of the system with its existing system is analyzed using various metrics. These measurements include the calculation of parameters such as MSE, IPDV estimators at the network layer, PSNR and VQM at the application layer.

4. RESULTS

Initially, the input to the system is given as the text message and transmitted across the wireless medium. This input data is passed as the seven bit ASCII code (American Standard Code for Information Interchange) and then received at the sink node. It is depicted with the help of the simulation results shown in MATLAB (MATrix LABoratory).

For the input text message “Hello” the corresponding ASCII code is 48 65 6C 6C 6F which is given as input and the output is received at the destination. The results of the simulation are given below as follows:





5. CONCLUSION

A reliable and efficient analysis of the WAN supporting video-streaming services has been performed from the service source to the end user respectively. Specifically, the problem of delay is vanquished by the technique of reduced resolution video transmission over the wireless network to enable the users for better perception of videos without any inconsistencies. This mode of communication is achieved in unicast systems successfully. The future work of this paper can be done in multicast systems for efficient video-streaming services.

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WIRELESS COMMUNICATION

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ABSTRACT

When a mobile originates a call, a call initiation request is sent on the reverse control channel. With this request the mobile units transmits its telephone number (MIN), Electronic Serial Number (ESN), and the telephone number of the called party. The mobile also transmits a station class mark (SCM) which indicates what the maximum transmitter power level is for the particular user. The cell base station receives the data and sends it to the MSC. The MSC validates the request, makes connection to the called party through the PSTN, and instructs the base station and mobile user to move to an unused forward and reverse voice channel pair to allow the conversation to begin. All cellular system provides a service called roaming. This allows subscribers to operate in service areas other than the one from which service is subscribed. When a mobile enters a city or geographic area that is different from its home service area, it is registered as a roamer in the new service area. This is accomplished over the FCC, since each roamer is camped on to an FCC at all times. Every several minutes, the MSC issues a global command over each FCC in the system, asking for all mobiles which are previously unregistered to report their MIN and ESN over the RCC .New unregistered mobiles in the system periodically report back their subscriber information upon receiving the registration request, and the MSC then uses the MIN/ESN data to request billing status from the home location register (HLR) for each roaming mobile. If a particular roamer has roaming authorization for billing purposes, the MSC registers the subscriber as a valid roamer. Once registered, roaming mobiles are allowed to receive and place calls from that area, and billing is routed automatically to subscriber's home service provider. My suggestion in this regard is after handshaking the roamer with home station if the roamer is a true person of that particular home station then the call is forwarded where the roamer is currently situated (New base station of a roamer which is at remote area).The current location base station take care of the call of the particular roamer this will reduce the per call cost of a roamer the billing preparation, network function are under the control of current location of a roamer. This will provide the roamer good communication with less cost. In this manner the future signaling system will be planned and designed.

KEYWORDS
wireless communication, MIN, ESN.

INTRODUCTION

Nowadays without mobile phones we cannot do nothing, in our day to day life the mobile phones are take importance to convey messages in the form of Video, Audio, and Data to our neighbours and friends who are all located remote areas. When the mobile user go away from his home location (Permanent location) where he is located to remote location, he/she is called a roamer, during roaming to enjoy mobile communication the user may pay considerable cost for per call designed by the network provider(Service provider), the reason behind this is the user may be a roamer he is handshake with home location register from the new location base station and his call is forwarded through the home location register for billing purpose this call forwarding procedure of SS7 add considerable amount to the user per call cost to avoid this the SS7(Signaling System 7) signaling system may adopt the new architecture such as after identify the home location register of the user the call may be forwarded through the new location base station call continuity, billing etc.,and cost of per call is to be reduced. This is my suggestion to call handoff strategy between mobile user and base station, Mobile Switching Center in future wireless networks.

REVIEW OF LITERATURE

When a mobile originates a call, a call initiation request is sent on the reverse control channel. With this request the mobile units transmits its telephone number (MIN), Electronic Serial Number (ESN), and the telephone number of the called party. The mobile also transmits a station class mark (SCM) which indicates what the maximum transmitter power level is for the particular user.

The cell base station receives the data and sends it to the MSC. The MSC validates the request, makes connection to the called party through the PSTN, and instructs the base station and mobile user to move to an un used forward and reverse voice channel pair to allow the conversation to begin. During call initiation the following steps to be followed,

HOW A CALL TO A MOBILE USER INITIATED BY A LANDLINE SUBSCRIBER IS ESTABLISHED

MSC (MOBILE SWITCHING CENTER)

i) Rece*ives* call from PSTN and sends the MIN to all base stations
ii) Verifies that the mob*ile has a* vali*d MIN, ESN* pair
iii) Requests BS to move mobile to unused voice channel pair
iv) Connects the mobile with the calling party on the PSTN

BS (BASE STATION)

FCC (FORWARD CONTROL CHANNELS)

i) Transmits page (MIN) for Specified user
ii) Transmits data message for mobile to move to specific voice channel

RCC (REVERSE CONTROL CHANNELS):– Receives MIN, ESN, station class mark and passes to MSC
FVC (FORWARD VOICE CHANNELS): – Begin voice transmission
RVC (REVERSE VOICE CHANNELS) - Begin voice reception

MS (MOBILE STATION)

FCC (FORWARD CONTROL CHANNELS):

i) Receives page and matches the MIN with its own MIN
ii) Receives data messages to move to specified voice channel

RCC (REVERSE CONTROL CHANNELS):
Acknowledges receipt of MIN and sends ESN and station class mark
FVC (FORWARD VOICE CHANNELS):- Begin voice reception
RVC (REVERSE VOICE CHANNELS):- Begin voice transmission

HOW A CALL INITIATED BY A MOBILE IS ESTABLISHED

MSC (MOBILE SWITCHING CENTER)

i) Receives call initiation request from base station and verifies that the mobile has a valid MIN, ESN pair
ii) Instructs FCC of originating base station to move mobile to a pair of voice channels
iii) Connects the mobile with the called party on the PSTN

BS (BASE STATION)

FCC (FORWARD CONTROL CHANNELS):

Page for called mobile, instructing the mobile to move to voice channel.

RCC (REVERSE CONTROL CHANNELS):- Receives call initiation request and MIN, ESN, Station class mark

FVC (**FORWARD VOICE CHANNELS**): – Begin voice transmission

RVC (REVERSE VOICE CHANNELS):- Begin voice reception

MS (MOBILE STATION)

FCC (FORWARD CONTROL CHANNELS):

Receives page and matches the MIN with its own MIN. Receives instruction to move to voice channel.

RCC (REVERSE CONTROL CHANNELS):-Sends a call initiation request along with subscribe, MIN and number of called party

FVC (**FORWARD VOICE CHANNELS**):- Begin voice reception

RVC (REVERSE VOICE CHANNELS): - Begin voice transmission

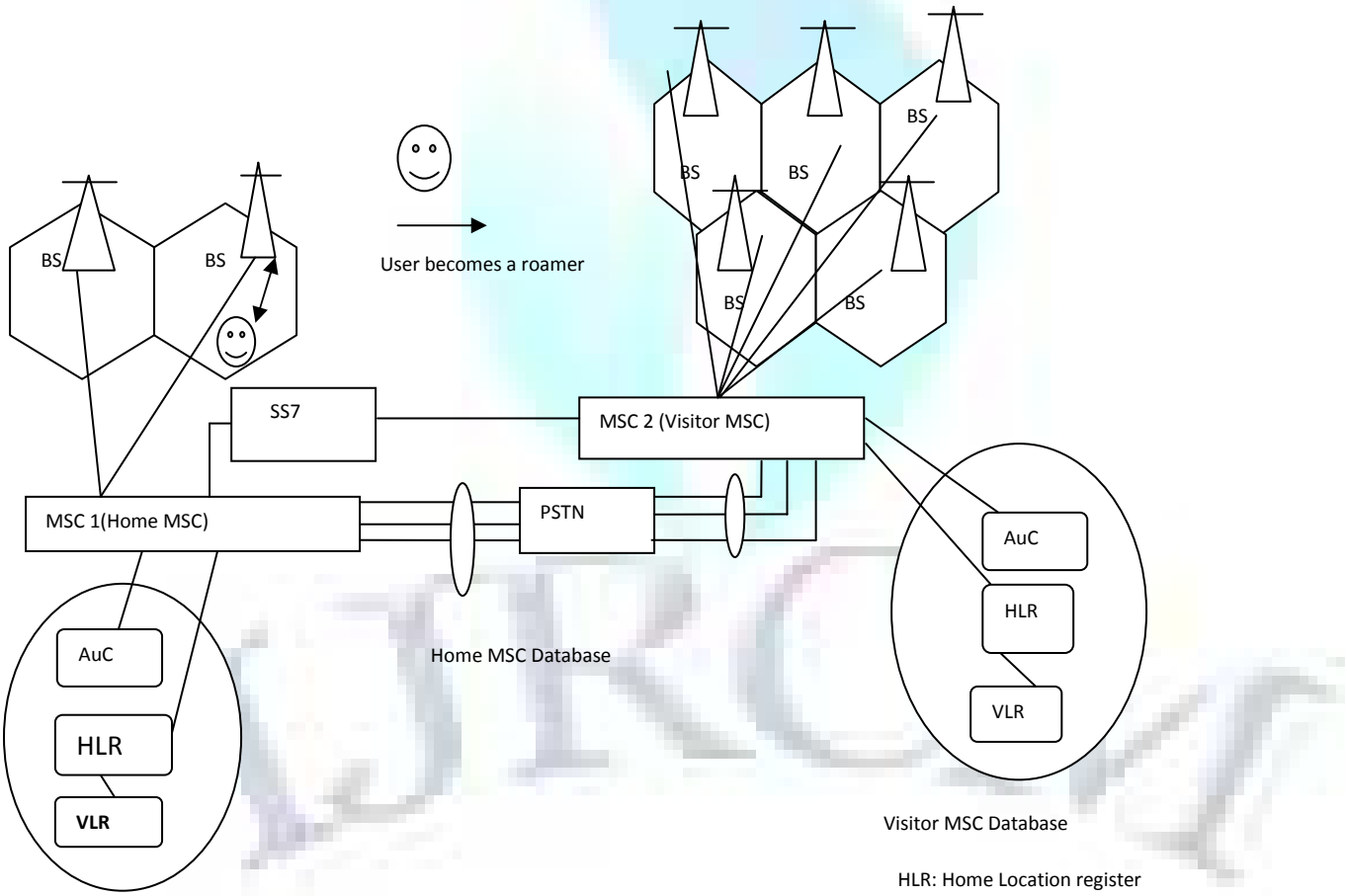
All cellular system provides a service called roaming. This allows subscribers to operate in service areas other than the one from which service is subscribed. When a mobile enters a city or geographic area that is different from its home service area, it is registered as a roamer in the new service area. This is accomplished over the FCC, since each roamer is camped on to an FCC at all times.

Every several minutes, the MSC issues a global command over each FCC in the system, asking for all mobiles which are previously unregistered to report their MIN and ESN over the RCC .New unregistered mobiles in the system periodically report back their subscriber information upon receiving the registration request, and the MSC then uses the MIN/ESN data to request billing status from the home location register (HLR) for each roaming mobile.

If a particular roamer has roaming authorization for billing purposes, the MSC registers the subscriber as a valid roamer. Once registered, roaming mobiles are allowed to receive and place calls from that area, and billing is routed automatically to subscriber's home service provider.

My suggestion in this regard is after handshaking the roamer with home station if the roamer is a true person of that particular home station then the call is forwarded where the roamer is currently situated.

The current location base station take care of the call of the particular roamer this will reduce the per call cost of a roamer the billing preparation, network function are under the control of current location of a roamer. This will provide the roamer good communication with less cost. In this manner the future signaling system will be planned and designed.



BLOCK DIAGRAM OF A CELLULAR RADIO NETWORK

NEED OR IMPOTANCE OF THE STUDY

To reduce the per call cost of the mobile user when the user be a roamer, this will support the user to enjoy communication in remote area at low cost.

STATEMENT OF THE PROBLEM

The current location base station take care of the call of the particular roamer this will reduce the per call cost of a roamer the billing preparation, network function are under the control of current location of a roamer. This will provide the roamer good communication with less cost. In this manner the future signaling system will be planned and designed.

OBJECTIVES

A) How a call to a mobile user initiated by a landline subscriber is established:

i) Role of Mobile Switching Center, Base station, Mobile station

ii) Importance of FCC,RCC,FVC,RVC

B) How a call initiated by a mobile is established:

i) Role of Mobile Switching Center, Base station, Mobile station

ii) Importance of FCC,RCC,FVC,RVC

C) Difference between own cell user of a cell site and roamer, per call cost of the same user

HYPOTHESES

All cellular system provides a service called roaming. This allows subscribers to operate in service areas other than the one from which service is subscribed. When a mobile enters a city or geographic area that is different from its home service area, it is registered as a roamer in the new service area. This is accomplished over the FCC, since each roamer is camped on to an FCC at all times.

Every several minutes, the MSC issues a global command over each FCC in the system, asking for all mobiles which are previously unregistered to report their MIN and ESN over the RCC .New unregistered mobiles in the system periodically report back their subscriber information upon receiving the registration request, and the MSC then uses the MIN/ESN data to request billing status from the home location register (HLR) for each roaming mobile.

If a particular roamer has roaming authorization for billing purposes, the MSC registers the subscriber as a valid roamer. Once registered, roaming mobiles are allowed to receive and place calls from that area, and billing is routed automatically to subscriber's home service provider.

My suggestion in this regard is after handshaking the roamer with home station if the roamer is a true person of that particular home station then the call is forwarded where the roamer is currently situated. This will provide the roamer good communication with less cost. In this manner the future signaling system (SS7) will be planned and designed.

RESEARCH METHODOLOGY

RESULT AND DISCUSSION

My suggestion in this regard is after handshaking the roamer with home station if the roamer is a true person of that particular home station then the call is forwarded where the roamer is currently situated. This will provide the roamer good communication with less cost.

FINDINGS

People are suffering high call cost during roaming to avoid this after handshaking with the HLR the current location BS & MSC identified the user and disconnect the user from home station the call is once again forwarded by the current location till the end of the user termination.

RECOMMENDATIONS / SUGGESTIONS

The SS7 signaling system and CCS (common channel signaling) will designed in future after identified the roamer disconnect the call of the user from HLR and forwarded the call through the current location or new location (VLR, BS & MSC)

CONCLUSIONS

If a particular roamer has roaming authorization for billing purposes, the MSC registers the subscriber as a valid roamer. Once registered, roaming mobiles are allowed to receive and place calls from that area, and billing is routed automatically to subscriber's home service provider.

My suggestion in this regard is after handshaking the roamer with home station if the roamer is a true person of that particular home station then the call is forwarded where the roamer is currently situated. This will provide the roamer good communication with less cost. In this manner the future signaling system (SS7) will be planned and designed.

LIMITATIONS

The limitations of the mobile user will breakup and he/she is a roamer will be enjoy communication with considerable low cost

SCOPE OF FURTHER RESEARCH

The SS7 signaling system and CCS (common channel signaling) protocols will be designed in future that after the identification of the roamer with HLR the connection will disconnected and forwarded through the new or current location VLR, BSS, MSC instead of HLR-MSC & BSS.

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SPIRAL SECURITY MODEL TO COUNTER THE THREATS DUE TO HUMAN FACTORS IN WEB APPLICATIONS

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ABSTRACT

Last few years, the security of web has taken a different turn. More and more attacks are done on applications. Also the severe lack of employee awareness is making security breaches particularly due to their weak operational practices. To make the task of the attackers easier, many a times the back-end systems are tied into the front-end ones. Due to the emergence of e-commerce systems, the integration of extranet has made the task of the security managers more complicated. The client side can be classified into external clients and internal employees. The social engineering practices employed by organizations may not be adequate for both categories of clients. We propose a spiral security model that includes the conventional planning phases to monitoring phases that takes the help of various technical components of web applications to counter the threats due to human factors. Though application firewall is a easier threat protection measure, but we propose a model that takes into account some corrective as well as preventive measures from the human perspective based on some technical components.

KEYWORDS

e- Commerce, Spiral Security, Human Factors, Corrective & Preventive.

1. INTRODUCTION

With the growth of e-commerce more and more web based applications are integrated to have intranet & extranet systems in place. India, an emerging economy, has witnessed unprecedented levels of economic expansion, along with countries like China, Russia, Mexico and Brazil. India, being a cost effective and labor intensive economy, has benefited immensely from outsourcing of work from developed countries, and a strong manufacturing and export oriented industrial framework. In 2009 out of $161.3 billion most of the FDI went to the IT and ITeS sector. Experts expect the Indian economy to be the world's biggest economy by 2040.

Strengthening the trust framework, including information security and network security, authentication, privacy and consumer protection, is a prerequisite for the development of the Information Society and for building confidence among users .

In a nutshell, the perception of cyber-threats therefore has two main aspects: On one side A new kind of vulnerability due to modern society's dependency on inherently insecure information systems, and the expansion of the threat spectrum, especially in terms of malicious actors and their capabilities, on the other side[12].

Attackers have changed trends to attack more on the application than the traditional attacks. Most of these attacks take a social approach [1,2] than the technical approach. Security processes need to be kept in all places keeping the attackers mentality in view. Particularly as the clients are used by the attackers through social practices, new social engineering methodologies should be kept in place involving the clients. We have proposed a spiral security model involving both corrective & preventive actions to counter the threats from the human factors. This paper consists of the following sections. Section 2 describes the existing security measures against application threats in the e-commerce systems. The vulnerabilities on web based systems due to the social factors and the protective measures are discussed in Section 3.

We have proposed a new security model called as spiral security model for the web based applications to counter the threats due to human factors in section 4. Section 5 gives the conclusion and final remarks.

2. EXISTING SECURITY MEASURES FOR E-COMMERCE APPLICATIONS THREATS

The major security issues are confidentiality, integrity and availability. Of late privacy and non-repudiation are added to the security of e-commerce systems. However, authentication, authorization and auditing are the three major factors for the security of applications. There are many recorded application vulnerabilities and their counter measures in the web application threat model [3]. In this section, we will categories of web application vulnerabilities and their countermeasures.

2.1. KEY APPLICATIONS THREATS

The key points for web applications are already identified as following.

- Input and data validation
- Authentication
- Authorization
- Configuration management
- Sensitive data
- Session management
- Cryptography
- Parameter manipulation
- Exception management
- Auditing and logging

The threats that can arise due to these key points are shown in the table below.

TABLE 1: KEY APPLICATION AREAS

Key Points	Description
Input and data validation	Input validation refers to validation of input by the application filters before additional processing.
Authentication	Authentication is the process where an entity proves the identity of another entity, typically through credentials, such as a user name and password.
Authorization	Authorization is to check how the application provides access controls for resources and operations.
Configuration management	Configuration management refers to the handling operational issues of the application. It includes questions like as to how the application is administered, which databases it connects to and how these settings are secured.
Sensitive data	Sensitive data refers to how your application handles any data that must be protected either in memory, over the wire or in persistent stores.
Session management	A session refers to a series of related interactions between a user and the web application. Session management refers to how the application handles and protects these interactions.
Cryptography	Cryptography refers to how the web application enforces confidentiality and integrity. It includes questions like how secured and tamperproof the data or libraries are? How strong are the seeds for random values that must be cryptographically strong?
Parameter manipulation	Parameter manipulation refers to safeguards of parameters and how the application processes input parameters.
Exception Management	It is the management of failure of application. It includes questions like does the application fails gracefully or does it return friendly error information to end users?
Auditing and logging	Auditing and logging checks as to how the application records security related events i.e. who did what and when?

The threats related to the key points can be shown in the following table.

TABLE 2: KEY APPLICATION THREATS

Key Points	Threats
Input and data validation	Buffer overflow, cross-site scripting, SQL injection
Authentication	Network eavesdropping, brute force attacks, dictionary attacks, cookie replay, credential theft
Authorization	Elevation of privilege, disclosure of confidential data, data tampering, luring attacks
Configuration management	Unauthorized access to administration interfaces, unauthorized access to configuration stores, retrieval of clear text configuration data, lack of individual accountability, over privileged process and service accounts
Sensitive data	Access sensitive data in storage, network eavesdropping, data tampering
Session management	Session hijacking, session replay, man in the middle
Cryptography	Poor key generation or key management, weak or custom encryption
Parameter manipulation	Query string manipulation, form field manipulation, cookie manipulation, HTTP header manipulation
Exception management	Information disclosure, denial of service
Auditing and logging	User denies performing an operation, attacker exploits an application without trace, attacker covers his or her tracks

2.2. SECURITY MEASURES AGAINST THE APPLICATIONS THREATS

The countermeasures for the traditional security threats are already given by many authors from time to time. For instance, in the SQL injection under the input validation, the countermeasure can be as follows:

- A thorough input validation should be performed. The application should validate its input prior to sending a request to the database.
- Parameterized stored procedures for database access should be used to ensure that input strings are not treated as executable statements. If stored procedures can't be used, SQL parameters can be used to build SQL commands.
- Least privileged accounts should be used to connect to the database.

Similarly, countermeasures to prevent cookies replay under authentication can include the following:

- An encrypted communication channel provided by SSL should be used whenever an authentication cookie is transmitted.
- A cookie timeout to a value should be used that forces authentication after a relatively short time interval. Although this doesn't prevent replay attacks, it reduces the time interval in which the attacker can replay a request without being forced to re-authenticate as the session has timed out.

Also, countermeasures for unauthorized access to administration interfaces under the configuration management can include the following:

- The number of administration interfaces should be minimized.
- Strong authentication e.g. using digital certificates should be done.
- Strong authorization with multiple gatekeepers should be done.
- Local administration should only be done. If remote administration is absolutely essential, encrypted channels such as VPN technology or SSL should only be used. In order to further reduce the risk, IPSec policies should be used to limit remote administration to computers on the internal network.

3. THREATS ON E-COMMERCE APPLICATIONS COMPONENTS DUE TO SOCIAL FACTORS

The major components of e-commerce applications are front-end web server, middle-tier application server and the back-end database server. Some of the counter measures of the key security issues as discussed earlier e.g. secured configuration, validating inputs, exception handling and authorizing users can be applied to the web server in order to protect it. The application server needs to apply the counter measures for authentications and authorization. The auditing and logging activities on transactions need to be employed in the application server as well. The database server needs to be protected by the usage of hashing techniques as sensitive data are available there. The various social factors that can cause threats to these components are discussed below.

3.1. KEY SOCIAL FACTORS ENABLING APPLICATION THREATS

The key social factor for gaining access to e-commerce applications is to get acquaintance of the system. Social engineering is the practice of obtaining confidential information by manipulation of legitimate users. Some of the key issues that can create threats to the e-commerce application is given below:

- Gathering information about employees through mailers e.g. survey etc.
- Gathering information about employees by developing relationships
- Forensic analysis of the hard drives, memory sticks etc.
- Pretending to be a senior manager or helpless user
- Pretending to be a technical support engineer
- Disgruntled employees

The threats that can arise due to these key points are mainly accessibility to the various resources of the e-commerce system. The CISCO 2008 annual report tells that human nature, in the forms of insider threats, susceptibility to social engineering and carelessness that leads to inadvertent data loss, continues to be a major factor in numerous security incidents [4].

3.2. COUNTER MEASURES FOR THE SOCIAL FACTORS

There are well defined counter measures for the security threats due to the social factors.
Some of them are given below.

- A well documented Security Policy accessible to employees & training provided to the employees
- Awareness of threats and impact of social engineering on the company
- Implementation of proper security audit
- Proper Identity Management policy for authentication
- Clear cut operating policies & procedures to limit vulnerabilities.
- Use of advanced physical solutions such as intelligent revolving doors, biometric systems, etc. to eliminate or reduce unauthorized physical access

Some of the hacker tactics and the combat strategy [5] from the social engineering aspect are listed. However, a more generic well-documented Security Policy and associated standards and guidelines can form the foundation of a good security strategy. The policy should clearly document in ordinary terms so that the ordinary user i.e. the employee will understand. Also along with each policy, the standards and guidelines to be followed should be clearly explained. Some of the broad outlines of this policy should include the following:

- Computer system usage: Monitoring the usage of the use of non-company standard mails or activity.
- Proper Information classification and handling: Confidential information should be properly classified and should not be available to everybody.
- Personnel security: Proper screening new employees and other visitors to ensure that they do not pose a security threat.
- Physical security: Proper authentication process for allowing employees to secure portions inside the company e.g. sign in procedures through electronic and biometric security devices etc.
- Information access: Password usage and guidelines for generating secure passwords, access authorization.
- Protection from viruses: Working policies for protection of the systems from viruses and other threats.
- Security awareness training: This ensures that employees are kept informedof threats and counter measures.
- Compliance monitoring: This ensures that the security policy is being complied with.
- Documentation destruction: All information should be disposed of by shredding not by discarding in the trash or recycle bins.

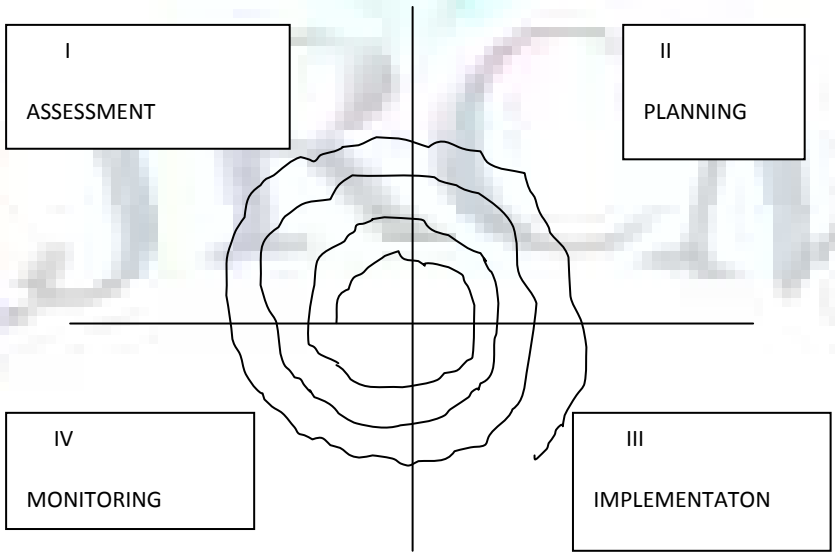
4. SECURITY MODEL FOR E-COMMERCE APPLICATIONS

As far as design of e-commerce applications are concerned, the counter measures of the key security issues on its major components are discussed earlier e.g. secured configuration, validating inputs, exception handling and authorizing users for web servers, authentications, authorization, auditing and logging activities for the application server, etc. In order to counter the vulnerabilities in the e-commerce application design, there are secured design considerations. For example, under input validation, constraining input is one of the preferred approach. This is about allowing good data. The idea here is to define a filter of acceptable input by using type, length, format and range. Use cases should be written and the acceptable input for the application fields should be written.
Similar to the input validation techniques, strong authentication techniques mainly in terms of passwords policies should be prepared. Strong passwords, password expiry period and account lockout policies can safeguard the servers. However, the concern is not in the design issues rather in the human issues. In this section, we propose some corrective & preventive measures from the human perspective.

4.1. DATA LEVEL VALIDATION

Though the design consideration makes input validation in a proper manner, what about the disgruntled employees who makes some changes in the data layer that can create chaos in the e-commerce system. For example, in a shopping cart example, if an accounting operator is given privilege of changing the rate of certain items as there is a change in the rates and he changes the rates of some other items whose rates are not changed, this is an issue of data integrity. Here there are two counter measures that can be offered as given below.
1. Allowing item wise privileges to the employee to change data.
2. Counter authorizing the changes by the account manager.
However, there is still human factor for both these cases. In the first case, many a times even though item wise privileges are given to the particular employee, he can mention certain problem in the system and get the general privilege from the system administrator.
With regard to the second case he might have obtained the password of his manager by some means. Therefore, even if a threat tree [6] will be drawn and both these threats due to human factors can be made “AND”, still there is always a chance of malicious intent.
This type of threat can only be detected if the a data layer audit is made and its cycle should be short depending on the number of e-commerce transactions in the system.
Therefore, a continuous monitoring is required as may be seen in the proposed spiral model in figure 1 below:

FIGURE 1: SPIRAL MODEL FOR E-COMMERCE SECURITY



4.2. SYSTEM LEVEL AUTHORIZATION

When the design of application is made, minimum access to the system level recourses should given. In fact, restrictions should be placed on the application in terms of which system-level resources it can access. This risk mitigation strategy can limit damage to the Assessment Planning Monitoring Implementation application.

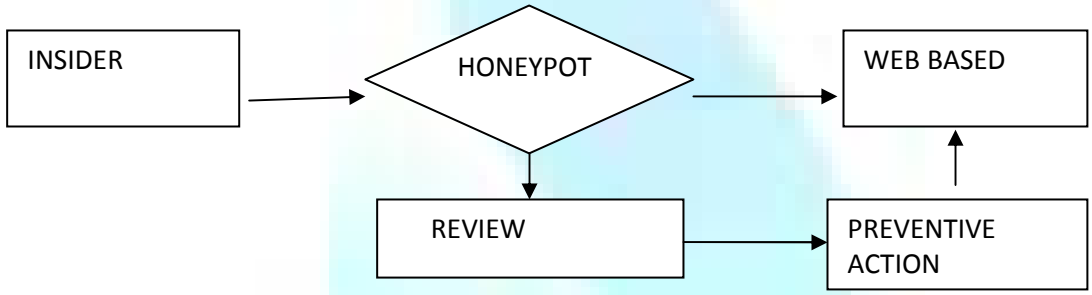
This code access security is a resource constraint model that can prevent code and Web applications from accessing specific types of system-level resources. When code access security is used, it inevitably influences the application design. Also, the application design should identify all of the identities that the application uses, including the process identity and any impersonated identities, including anonymous Internet user accounts and service identities. The design should also indicate to which resources these identities require access. At deployment time, the appropriate access control list can be configured on system-level resources to ensure that the identities of the application only have access to the resources they require. However, the insider threat research indicates that 57% of the insiders were granted access to system administrator's password upon hire and another 33% of the insiders were hired as privileged uses [7].

One of the major preventive method for insider threat is proper screening of employees. However, as prevention of insider threat is the costliest and can make much damage, some preventive actions can be made as given below:

- Conducting careful background checks.
- Clearly documenting insider threat controls.
- Enforcing separation of duties and least privilege.
- Implementing strict password and account management policies and practices.
- Monitoring and auditing every employee's online actions.
- Monitoring and responding to suspicious or disruptive behavior.
- Making usage of additional controls for system administrators and privileged users.
- Layered defense against remote attacks should be made.
- Following termination of employee immediately deactivate access.
- Collection of employee data for investigations, if required.
- Implement secure backup and recovery processes.

Also a better option can used to spot the disgruntled employees is implementation of a honeypot [8,9]. These honey pots can provide valuable information on the patterns used by insiders. We have suggested to use a honeypot as shown in figure 2 to identify the employees usage pattern and accordingly take preventive action.

FIGURE 2: A PREVENTIVE HONEYPOT MODEL FOR INSIDERS



In fact, both the data layer audit for a corrective action and the insiders usage patterns for a preventive action can be monitored regularly using the spiral model and fresh assessment about the security of the e-commerce application can be made. This Insiders System Review Honeypot assessment needs proper planning for final implementation. As this process is an ongoing one, we have proposed this spiral model for the security of web applications.

5. CONCLUSION

Though the design considerations from the security perspective for web applications are clearly stated in many of the research papers, the security issues from the human perspective is hardly considered from the technical perspective. Only some counter measures for social factors as discussed in section 3.2 are suggested by researchers from time to time. Even Intrusion Detection Systems (IDS) are not able to track insider attacks [8] and the complexity of using a combination of IDS systems [10] may not be adequate.

Therefore, we have proposed a spiral model that takes into account a data layer audit for corrective action and finding the insiders usage pattern from a honeypot application for preventive action, those work in conjunction with each other to make an effective web based security model from the human perspective.

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AN EFFICIENT METHOD FOR IMAGE RESTORATION FROM MOTION BLUR AND ADDITIVE WHITE GAUSSIAN DENOISING USING FUZZY DE-NOISING AND RICHARDSON LUCY DECONVOLUTION

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ABSTRACT

The proposed system deal with the problem of restoration of images blurred by relative motion between the camera and the object of interest. For correct restoration of the degraded image, it is useful to know the point-spread function (PSF) of the blurring system. It is a straightforward method to restore motion-blurred images given only the blurred image itself. The method first identifies the PSF of the blur and then uses it to restore the blurred image. The blur identification here is based on the concept that image characteristics along the direction of motion are affected mostly by the blur and are different from the characteristics in other directions. By filtering the blurred image, we emphasize the PSF correlation properties at the expense of those of the original image.

KEYWORDS
Motion Blur, Image Restoration, Image Degradation.

1. INTRODUCTION

A long-distance imaging system can be strongly affected by atmospheric turbulence, which randomly changes the refractive index along the optical transmission path, generating geometric distortion (motion), space and time varying blur, and sometimes even motion blur if the exposure time is not sufficiently short. Aside from hardware-based adaptive optics approaches, several signal processing approaches have been proposed to solve this problem. These approaches attempt to restore a single high-quality image from an observed frame sequence distorted by air turbulence. As with these other works based on videos or image sequences, we work under the assumption that the scene and the image sensor are both static, and that observed motions are due to the air turbulence alone. The imaging process can be modeled as some multi-frame reconstruction approaches first employ a non-rigid image registration technique to register each observed frame with respect to a fixed reference grid, and use the registration parameters to estimate the corresponding motion field for each frame. Unfortunately, the assumption of constant motion during the entire imaging process does not hold for many cases of motion blur. For example, analysis of images taken with small digital cameras shows that consecutive images covering the same scene have different motion blur. In particular, the direction of motion blur is different from one image to another due to trembling of the hand. In the image restoration algorithm included an estimation of the PSF (Point Spread Function) from two images. However, it assumes a pure translation between the images, and uses the location of singularities in the frequency domain which are not stable.

One solution that reduces the degree of blur is to capture images using shorter exposure intervals. This, however, increases the amount of noise in the image, especially in dark scenes. An alternative approach is to try to remove the blur off-line. The problem of restoration of blurred image with complex background and noise reduction has proved unsolved. The blurred part is complex to extract from the complex background in the previous system, and then it is pasted onto a bottom with monochromatic background with multiple noises like additive and specular noises.

Image deconvolution algorithm varies the result and only focus on exposure of rectilinear blur, for which a statistical analysis based methods, produces unsatisfactory results. More specifically, each restoration-error model describes how the expected restoration error of a particular image- deblurring algorithm varies as the blur due to camera motion develops over time along with the PSF trajectory, which we effectively handle by means of statistical descriptors.

The peculiarity of the proposed methodology is that it simultaneously takes into account the motion blur and additive noises, its interplay with the sensor noise, and the motion randomness. To put our contribution in perspective, let us briefly summarize some of the most important related works, where ad-hoc devices and controlled or customized acquisition strategies are devised to ease the restoration task.

Differently from image stabilization techniques, which counteract/prevent the blur, most computational-photography techniques leverage particular acquisition strategies (or settings) that make the algorithmic inversion of the blurring operator easier. These algorithms can be divided into two classes: the first class consists of algorithms that couple the blurred image with some additional information, while the second class consists of algorithms that tweak the camera acquisition to obtain PSFs that are easier to invert. The first class of algorithms includes, which exploit hybrid imaging systems (provided with two cameras having different resolutions) that are able to measure their own motion during the acquisition.

2. RELATED WORK

In previous works of Giacomo Boracchi and Alessandro Foi (1) the PSF trajectories as random processes and, following a Monte Carlo approach, expresses the restoration performance as the expectation of the restoration error conditioned on some motion-randomness descriptors and on the exposure time. This allows us to coherently encompass various imaging scenarios, including camera shake and uniform (rectilinear) motion, and, for each of these, identify the specific exposure time that maximizes the image quality after deblurring.

The work of Marius Tico, Markku Vehvilainen (2) the exposure times of the two images determines differences in their degradations which are exploited in order to recover the original image of the scene. We formulate the problem as a maximum a posteriori (MAP) estimation based on the degradation models of the two observed images, as well as by imposing an edge-preserving image prior.

3. OUR CONTRIBUTION

3.1 SINGLE IMAGE BLIND DECONVOLUTION

In image deconvolution, the goal is to estimate an original image $f = \{f(x, y), x = 1,\ldots,N, y = 1, \ldots,N\}$ from an observed version $g = \{g(x,y), x = 1,\ldots,N, y = 1, \ldots,N\}$, assumed to have been produced according to $g(x, y) = f(x,y) * h(x,y) + w(x,y)$,

where $h(x, y)$ is the blur point spread function (PSF), $\{n(x, y), x = 1, \ldots,N, y =1,\ldots,N\}$ is a set of independent samples.

Finally, a single image deblurring algorithm is required as a post-process to deconvolve the near-diffraction limited image Z.

The degradation model

$$Z = F \otimes h + \varepsilon$$

where ε represents error caused by the process generating the estimate of Z. where *ε* represents error caused by the process generating the estimate of *Z*. Such blind deconvolution algorithm can be described generally using the following

$$< \hat{F}, \hat{h} >= \arg\min_{F,h} \|Z - h \otimes F\|^2 + \lambda_1 R_f(F) + \lambda_2 R_h(h),$$

where *Rf* and *Rh* are the regularization terms based on prior knowledge about the latent sharp image *F* and the PSF *h*.

3.2 FUZZY IMAGE DENOISING

The general idea in this method is to take into account the fine details of the image such as edges and color component distances, which will be preserved by the filter. The goal of the first filter is to distinguish between local variations due to image structures such as edges. The goal is accomplished by using Euclidean distances between color components instead of differences between the components as done in most of the existing filters.

The proposed method uses 2-D distances instead of 3-D distances (distance between three color components red, green and blue), that is, the distance between red-green (RG) and red-blue (RB) of the neighborhood centered at (i, j) is used to filter the red component. Similarly, the distance between RG and green-blue (GB) is used to filter the green component and the distance between RB and GB is used to filter the blue component, respectively.

Similarly, fuzzy rules for the green component (using RG and GB couple) and the blue component (using RB and GB couple) can be computed. In the above fuzzy rules DISTANCE represents the Euclidean distance. DISTANCE (RG, NEIGH(RG)) = [(Ci+k,j+l,1 - Ci,j,1)2 + (Ci+k,j+l,2 - Ci,j,2)2]1/2 In the proposed approach, the membership function SMALL has been modified which incorporates a two-sided composite of two different Gaussian curves. The Gaussian function depends on two parameters σ and c as given by

$$f(x;\sigma,c) = e^{\frac{-(x-c)^2}{2\sigma^2}}$$

The membership function *gauss2mf* (supported by MATLAB) is a combination of two of these two parameters. The first function, specified by _1 and c1, determines the shape of the leftmost curve. The second function specified by _2 and c2 determines the shape of the right-most curve.

4. IMPLEMENTATION

Various methods for removing or preventing the motion blur degradation have been proposed. The existent solutions can be divided in two categories based on whether they are aiming to correct or to prevent the motion blur degradation. In the first category are those solutions that are aiming for restoring a single image shot captured during the exposure time. This is actually the classical case of image capturing, where the acquired image is typically corrupted by motion blur, caused by the motion that have taken place during the exposure time. If the point spread function (PSF) of the motion blur is known then the original image could be restored, up to some level of accuracy (determined by the lost spatial frequencies), by applying an image restoration approach. However, the main difficulty is that in most practical situations the motion blur PSF is not known.

To demonstrate the process of deconvolving in the entire image with the same kernel damages the unblurred parts. One obvious solution is to divide the image into regions and match a separate blur kernel to each region.While likelihood measure based on a big window is more reliable, such a window might cover regions from different blurring layers. Another alternative is to brake the image into segments using an unsupervised segmentation algorithm, and match a kernel to each segment. The fact that blur changes the derivatives distributions also suggests that it might be captured as a kind of texture cue. Therefore, it's particularly interesting to try segmenting the image using texture affinities. However, as this is an unsupervised segmentation process which does not take into account the grouping goal, it's hard to expect it to yield exactly the blurred layers. The output over-segments blur layers, while merging parts of blurred and unblurred objects.

Moreover, since the PSF depends of the camera motion during the exposure time, it is rather difficult to establish a universal model for the blur process. The lack of knowledge about the blur PSF suggests the use of blind deconvolution approaches in order to restore the motion blurred images. Unfortunately, most of these methods rely on rather simple motion models, e.g. linear constant speed motion, and hence their potential use in consumer products is rather limited. Measurements of the camera motion during the exposure time could help in estimating the motion blur PSF and eventually to restore the original image of the scene.

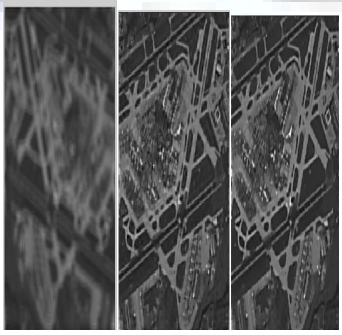
5. RESULTS

The proposed methodology for deriving a statistical model of the performance of a given deblurring algorithm, when used to restore motion blurred images. Differently from our earlier work on rectilinear blur , it do not enforce any analytical formulation for the trajectories generating the motion-blur PSFs and we deal with random motion, which is effectively handled by means of statistical descriptors of the PSF.

The extensive experiments on camera raw images investigated the blur/noise tradeoff that rules the restoration performance in presence of motion blur, and show that the computed restoration-error models provide estimates that are coherent with the results on real data.

In practice these models, combined with functions expressing how the PSF descriptors vary w.r.t. the exposure times, provide concrete guidelines for predicting the exposure time that maximizes the quality of the image restored by the corresponding algorithm. The outcomes of the restoration error models obtained from three different deconvolution algorithms (namely the anisotropic LPA-ICI deconvolution, the deconvolution using sparse natural image priors, and the Richardson– Lucy deconvolution), agree with the results, with the acquisition strategies followed in the practice to cope with camera shake, and with an extensive experimental evaluation performed on camera raw images.

FIGURE 1: A) BLURRED AND NOISY IMAGE B) DEBLURRED NOISY IMAGE AND C) FUZZY DENOISED IMAGE

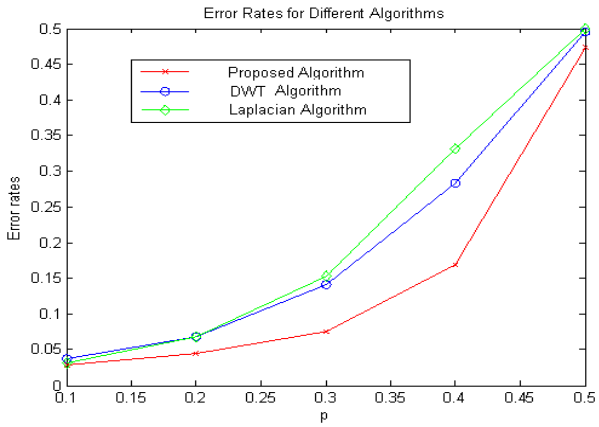


A B C

TABLE 1: SHOWS THAT THE ERROR RATES OF THREE DIFFERENT ALGORITHMS

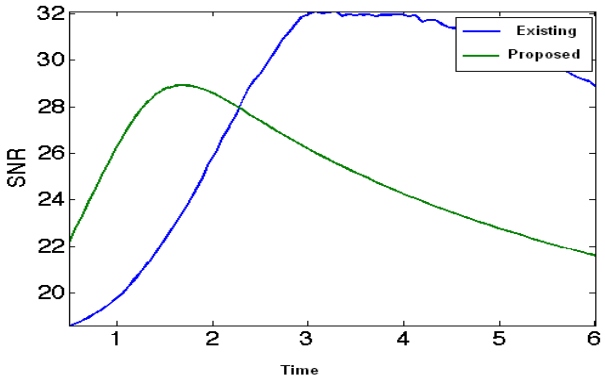
Image Error Measurements	Noisy Image Values	Proposed Denoise and Deblur Algorithm	DWT Algorithm	Laplacian Algorithm
ISNR	3.864589	4.564685	3.98434	4.03845
SNR	20.81562	21.99787	20.94387	20.54982
PSNR	29.97736	31.55962	29.99432	30.08732
MSE	65.3648	56.16338	63.50982	64.07126
RMSE	8.08485	7.49064	7.982340	7.838655
MAE	5.497884	5.001370	5.387458	5.256787
MAX	123.8326	104.7897	120.7397	119.4903

FIG. 2: COMPARISON OF ERRORS MEASUREMENTS



To demonstrate the significant improvement arising from our modified algorithm, comparely it reduce the processing time. First, it restore the image applying the algorithm in a straightforward manner, estimating the noise using the standard parameters that were optimized for the Gaussian case. Second, tune the parameters, in order to compensate to the wrong noise model. In existing Denoising Completed in 32.19 seconds and De Blurring completed in 8.22 seconds on same hand in proposed it achieves the result of Denoising image in 22.16 seconds and De Blurring image in 6.68 seconds.

FIG. 3



6. CONCLUSION

Our image restoration process takes into account of motion blur by allowing some pixels to be reconstructed from a single image, but a full treatment of deconvolution remains an open challenge. Our solution uses two exposures in order to cover the full velocity range while minimizing the time overhead and additive noise penalty. According to experiments on both synthetically generated observation and on camera raw data, the estimated optimal exposure times correspond to observations that are corrupted by noise levels that are far from being negligible. The comprehensive study of solutions relying on an arbitrary number of exposures is, however, an important open question which requires careful modeling of the motion blur and noise.

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STUDY OF LITERATURE FOR EFFECTIVE BUSINESS COMMUNICATION

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ABSTRACT

With the global expansion of industrialisation and market economy across borders and cultures, ably assisted by communication technologies, communication skill for business purposes has acquired a greater importance in educational curriculum today. The post-modern ethos of 'decentring' has also created a new wave of thinking which has given a lot of credibility to the notions of relativist fragmentation to almost all the institutions of 'meaning'. Instead of an integrated approach to the learning of languages, we have reduced the patterns and processes of learning into segmentations and compartmentalisation, with all kinds of new ideas floated around in the name of specialisation. For example, today English language teaching has been segmented into different schools such as communication skills, business skill, functional English, study of literature, so on and so forth. The aim of the paper is to examine the merits of using the experiential approach to literature to teach Business English. The use of literature to teach Business English, in my humble view, will definitely help the students not only in increasing their retention capabilities, but also facilitate process-oriented learning which helps the students in developing interpersonal and inter-cultural skills quite essential in the business context.

KEYWORD
business communication.

INTRODUCTION

The last twenty two years of neo-liberal economics in India have witnessed a huge growth and expansion of the concept of Business English. Today the idea has acquired the status of a major branch in English teaching departments. However there is not much thought going into the area as to what constitutes Business English, its methodology, needs analysis, course planning, assessment and evaluation, and classroom management. Recently there has been a glut of second rate textbooks on the subject of business English trying to reveal the purpose, relevance and need of this kind of learning. The textbooks also focus on the issues of methodology and strategies to be adopted so as to acquire the skills in business communication. According to Hewings and Nickerson two calls have been heard continuously from those involved in training in Business English: the need to "report good practice and share experience", and the need for "more applied linguistic research into the use of English in business in order to inform teaching (v)". This paper tries to examine the first call to share experience.

However there is an urgent need to explore the role and relevance of literature in teaching Business. Linguists like Duangsamosorn emphatically extend the argument for the inclusion of literature in curriculum "to improve the students' ability in effective business communication (19)". There are scholars who suggest using literature in the Business English classroom to help students understand other cultures better. There are also experiential studies conducted to claim that teaching of literature helps the students to improve their English proficiency and communicative effectiveness in business writing. But there is no clarity of purpose so far which demonstratively shows how literature can actually be included and used to teach specific business skills such as writing letters, reports, resumes, and giving presentations.

OBJECTIVE

This paper aims to discuss the issue of use of various forms of literature to teach the writing of business correspondence and other business communications. This paper also attempts to examine the benefits of using the experiential approach to literature to teach Business English. The hypothesis of the study is that the teaching of literature helps the students to retain what they learn for the long-term and equip them better to understand and deal with the contexts of the interpersonal and inter-cultural communications.

DISCUSSION

Though term 'literature' has often been defined as the 'most beautiful' and the most 'refined' creative endeavour of human imagination, its role in English language teaching is still under the shadow of doubt. McRae defines literature as "any text, whose imaginative content will stimulate reaction and response in the receiver (vii)". But for the students of business communication, it is not the literary and cultural aspects of literature that is important. It is fundamentally a study of 'language in operation'— how language can be used for different purposes, such as giving information, expressing feelings, and persuading someone; and the different methods by which language operates, such as statement, comparison, understatement, metaphor and irony. The aesthetics becomes important in the sense that the students must get attracted to good literature to seek aesthetic pleasure, and then to experience the creative use of language used in different social and cultural contexts. This approach is based on theories of language acquisition through visualisation process in order to acquire the ability to use. There is no need to teach grammar or the rules of the language separately. The entire process is inductive where learners discover rules for themselves through the visualisation process. Many scholars are of the opinion that it is more useful for the students to discover the rules of the language for themselves, rather than being told what the rules are.

Since the primary purpose is the acquisition of communication skill in Business operations, the material to be included as part of the curriculum is selected to achieve that simple goal alone. As Business English implies the "definition of a specific language corpus and emphasis on particular kinds of communication in a specific context" (Ellis and Johnson (3), the materials that is being used today is intended for a core module in business communication, called Practical Business and Information Communication, where the students receive instruction on skills such as letter writing, resume writing and interviewing for jobs, minutes writing and conducting meetings. What is expected by the students is that at the end of this business communication course, they will be equipped with skills to communicate effectively in English at their workplace. Since the pattern of evaluation in our education system happens to be the written examination, the entire focus of the teaching is restricted to letter writing. But this is no communication skill. Communication has to be an expression of one's personality – thoughts, feelings and ideas - in all situations. For a student of business it is also meant to convince others to his/her point of view by effective communication. And for an effective communication the experiential knowledge of divergent inter-personal and inter-cultural contexts is hugely important. This is where the teaching of literature adds immense value to enhance and harness the effective communication skills to be used in business situations.

Reading vast variety of literature definitely helps in not only achieving short term simple linguistic skills and knowledge, but the ability to retain this experiential knowledge and use it in the long-term also. It is through the study of literature that the students can learn about situations and contexts from which words in print derive their meanings. In the process they learn how to use the language to express themselves in a variety of different contexts. Through the study of literature, the students are able to listen to different voices and respond to these voices. These are the voices that a business manager has to encounter. His response has to adequately respond to his assessment of the background, location and psychology of the customer.

There is universal acknowledgement of the hypothesis that language can be learnt only by use. Hence four ways suggested for the learning of any language are reading, writing, speaking and listening. If a student does not use the information or knowledge acquired, it tends to vanish from his memory very quickly. In fact this has been the bane of Indian education system. We give too much importance to the marks scored in the examinations. At the time of examination the

students tend to cram information for a test, and then right after the test, the utility of that information is felt no more. In the absence of any refreshing taking place through experiential mode, the information simply leaks out of their heads. The continuous engagement with literature would mean not only a continuous refreshing of the memory but an extension of that memory through encounters with the new words and structures, meanings and metaphors. To me the inclusion of literature in the teaching of business communication is quite useful and relevant in more than one way. It helps the students in improving their business communication skills through developing sensitivity and empathy. It gives aesthetic pleasure and helps in the refinement of their personality. The study of literature also improves the "capacity" of the students to exploit the knowledge in the long run as the experiential encounters with the fictitious world of literature will continue to fine tune their knowledge of the language at every step.

Today we live in a different kind of reality. The tremendous advances in the field of science and technology have reduced the physical distance between places and persons. The world has become a global village. The world of business thrives on the notions of competition and innovation. Everyone is in a race where the fittest survives. In such an unhealthy environment it becomes essential to develop the interpersonal skills of love, sensitivity and empathy. To me this is the most important function of literature. A student of literature knows how to relate with the wider world. He understands human emotions and feelings better than the others. Nieragden is absolutely right in saying that the language studies need to move on from "teaching linguistic competence" to teaching "interpersonal and inter-cultural competence (3)". The success of every business enterprise today depends on people who are able to properly understand and handle corporate culture, client orientation and customer service. The managers, executives and even the salesmen must have right kind of aptitude and mental skills, in addition to the linguistic skills, to read between the lines in business dealings and communications and to know what people mean by what they say. In so many communications people try to conceal more than what they reveal. It requires a deep understanding of human nature and behaviour in interpersonal relationships to get to the bottom of truth. In business such competence to handle human relationships demand politeness and courteous behaviour. One way to teach interpersonal competence is to use literature. In literature we come across various characters confronting their peculiar situations. The students learn how to read these characters and behaviours, and, from such encounters with these characters of different temperaments and inclinations, they easily differentiate between the real and the unreal, truth and untruth, obvious and immanent, explicit and implicit. It is only literature in which readers often have to go beyond the 'stated' to dig out the truth lying hidden somewhere within the words and structures. Reading literature can help learners to acquire the ability to respond to utterances in which the meaning is not overtly stated but is concealed within the layers of the language. All Shakespearean tragedies reflect some tragic flaws in their protagonists, which ultimately leads to their tragic downfall from position and grace. It is through the readers' association with this wide range of human emotions and experiences that students can have a better insight into human nature and its complexities. It is these complexities and propensities which affect human communication. Through literature, readers are drawn into different worlds of the characters, and learn to put themselves in someone else's shoes and see the world through their eyes. This human touch or understanding can help students to become more effective business people.

Man has a perennial quest to lift the veils of this mysterious nature. He has also got a dim vision of the sane and sacred within himself. But the reality is such that he has to live with his adequacies and weaknesses without ever getting closer to these unfulfilled fantancies. In literature he finds a kind of catharsis through the display of these distinct romantic and metaphysical notions of 'the beautiful', 'the noble', 'the sane' and 'the sacred'. This acts as a great motivator. One of the reasons for using literature in the language classroom is that literary texts deal with issues and emotions important enough to the reader to make him or her read or write about them. Duff & Maley make a similar observation that "this genuine feel of literary texts is a powerful motivator, especially when allied to the fact that literary texts so often touch on themes to which learners can bring a personal response from their own experience (6)". We can learn something only if we find it interesting or relevant. Literature that is relevant in the social and cultural context can certainly stimulate the students and capture their attention. This kind of contextual literature, though imaginary in nature, enhances the motivation of the student to learn the language. But as far as possible the literature included in the curriculum should be such that the students should be able to relate with it culturally. In addition it should have "plenty of lively, challenging, stimulating activities capable of motivating learners who lack confidence in their ability to use English and who may tend to view ESP as only a requirement rather than in more positive terms (Waters, 11)". In the Indian context where most of the students have a very low-proficiency in language skills, especially in English, and don't have the requisite confidence to write or speak English, literature can be a good way of stimulating their interest through reading and listening modes.

There is another very important reason for the inclusion of literature in the curriculum for the purpose of imparting communication skills to the learners. Here we must make a distinction between what we call competence and capacity. It is not enough to acquire competency, which is nothing but the knowledge of language rules, systems and structures. It is quite essential to have the capability to make use of that competency in a productive fashion. Inclusion and study of literature can definitely help the learners in acquiring the "capacity" to apply their knowledge over time. In setting out learning purposes it is very important to acquire "the ability to create meanings by exploiting the potential inherent in the language for continual modification and change (Widdowson, 8)". As the study of literature develops the skills of thinking and processing, the use of literature can help students go beyond 'acquiring basic knowledge of the language' to 'learning about the language and it working systems. Sadly most of the Business English courses today are just confined to the issue of teaching competence or knowledge. That is probably one of the reasons why our techno-graduates don't find any employment in the market today. They may be competent enough to use certain phrases or sentences in specific situations. But they don't have the adequate ability to exploit that knowledge to tackle situations and problems which vary from day-to-day in the business context. Through literature, students do not just learn a set of rules and moves to write a certain genre of letters, but they learn to discern different meanings and deal with every situation with effective communication ability.

However it is sad to see that Shakespeares and Wordsworths, Munshi Prem Chand and Mulak Raj Anands have become totally irrelevant for the students of languages who just want to acquire a functional knowledge of the language to succeed in the world of trade and business. The students of languages just have a short-term view of things. The standard textbook materials in business communications appear to have better hold on their mind sets than the experiential mode of language learning through the study of literature. May be one short term target for all Indian students to be achieved is a good score or good grade in the examination. But if they tune in to the rich world of literature, they will achieve 'capacity' to exploit knowledge over the long-term. However, all the methods and methodologies tried so far for the acquisition of communication skills for functional purposes have only been exploratory so far. In my view an integrated approach in teaching business communications is more useful and relevant and worth exploring in the future. It is heartening to see many of our premier institutions such as IITs and IIMs opening up to the interdisciplinary approach of pedagogy and introducing the teaching of literature as a subject for B. tech. students.

CONCLUSION

All the linguists agree that language can only be learnt only by use - reading, writing, speaking and listening. If a student does not use the information or knowledge acquired, it tends to vanish from his memory very quickly. In Indian education system we give too much importance to the marks scored in the examinations. At the time of examination the students tend to cram information for a test, and then right after the test in the absence of any refreshing taking place through experiential mode, the information simply leaks out of their heads. The continuous engagement with literature would mean not only a continuous refreshing of the memory but an extension of that memory through encounters with the new words and structures, meanings and metaphors. To me the inclusion of literature in the teaching of business communication is quite useful and hugely relevant. In a competitive environment it will help the students in improving their business communication skills through developing sensitivity & empathy and interpersonal & intercultural skills. As literature provides aesthetic pleasure to the senses and helps in the refinement of their personality, it will act as a great motivator for the students to tune in and improve their communication skill, even if by default. The study of literature also improves the "capacity" of the students to exploit the knowledge in the long run as the experiential encounters with the fictitious world of literature will continue to fine tune and refresh their knowledge of the language at every step.

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A PROCEDURAL APPROACH TO BRANDING HR

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ABSTRACT

A question that seems to be popping up more and more in the minds of recruiters and general HR leadership is, "Why should branding be important to me? I work in HR, not marketing." In proposing my response to this question, I must admit that just a few short years ago my answer would have been significantly more limited than it is today, in that branding in HR has traditionally been limited to the employment function. But while employment branding has always been a topic of great interest to many leading recruiting professionals, the importance of mastering the concepts and skills behind branding have much greater implications for HR professionals in the "new economy." A "good company tag" is critical to a company's ability to attract, motivate and retain the best and the brightest, thus gaining competitive advantage in the marketplace. Internationally, those companies that are voted as Best Companies to Work For also yield higher returns for shareholders. In fact, employee attitudes are directly linked with company performance, according to Watson Wyatt's Human Capital Index. Additionally companies that are considered good employers have a strong identity and image in the marketplace. . Employer branding is the process of creating an identity and managing the company's image in its role as an employer. As organizations are complex, open systems, single interventions are not enough. The employer brand has to be aligned and congruent with what the company delivers to the employee, customer, public and shareholder.

KEYWORDS
Branding HR, Feedback, Performance Management, Skills, Workforce.

1. INTRODUCTION

We start our day with a morning jog in Nike athletic shoes, we go to work dressed in a Raymond's suit in a new Accent car, and stop along the way for having a cup of coffee at Cafe Coffee Day.

These aren't mere shoes, clothes, cars and coffee we are talking about. These are brands, and chances are you have to choose them not only because they meet your basic requirements of clothing, transportation and sustenance, but also because the brands promise a certain quality and style that you've come to rely upon. Great brands provide a source of identification and assurance of quality. These brands simplify decision-making and communicate the value they create for their customers. And great brands make and keep their promises. These characteristics differentiate great brands and cement their leadership credentials.

Branding in HR has traditionally been limited to the employment function. The HR branding has become a topic of great interest. The importance of mastering the concepts and skills behind branding has greater implications for HR professionals in the "new economy".

The success of an organization relies upon excellence in execution. Historically, corporate leaders have looked to other functions, such as product development, marketing and sales, to drive corporate success, today more and more eyes are looking towards HR as the call for need.

Success of the brand depends upon of awareness and relevance. If target audiences are not aware of the brand, if their internal and external customers don't notice your effort in the cacophony of messages they receive each day, then we will never have a chance to be relevant. And if they become aware of you, if you capture their attention and fail to deliver relevance, then they will learn to ignore you.

In this paper, we give an overview of the importance of branding, steps involved in building a brand for the HR department. In this paper, we have also described the importance of creating a brand for the HR department to attract, motivate and retain the best and brightest in order to survive in the competitive world.

Then we have analyzed the various sub systems of HR brand system which serves as the Unique Selling Proposition (USP) of the company to grow in a big way in the long run.

The success of any business relies on its execution. Organisations, in the past, looked up to functions like sales, marketing, R&D, etc, to foster the growth of the company, but today, they are also looking at HR for the same. Most professionals now admit that one of the few channels left to communicate the corporate brand to its customers is the employee. It plays a strategic role in bringing in the right kind of people into the organisation. Various researches have revealed that strong brands contribute to strong competitive presence in the market. Therefore, the importance of branding HR follows quite as a consequence. And the Times Ascent HR Forum, held in Delhi, on 17th July' 07 at Intercontinental, The Grand, invited industry experts to throw light on the process of evolution of HR from a mere backend job to a 'brand'.

2. THE CONCEPT OF EMPLOYER BRANDING

A "good company tag" is critical to a company's ability to attract, motivate and retain the best and the brightest, thus gaining competitive advantage in the marketplace. Internationally, those companies that are voted as Best Companies to Work For also yield higher returns for shareholders. In fact, employee attitudes are directly linked with company performance, according to Watson Wyatt's Human Capital Index. Additionally companies that are considered good employers have a strong identity and image in the marketplace. . Employer branding is the process of creating an identity and managing the company's image in its role as an employer. As organizations are complex, open systems, single interventions are not enough. The employer brand has to be aligned and congruent with what the company delivers to the employee, customer, public and shareholder. The factors that impact the employer brand are:

1.Reputation/integrity
2.Culture
3.Recruitment/orientation
4.Pay and benefits
5. Work /Life balance
6. Leadership and management

7. Performance management, growth and development of these seven factors in the employer branding model, four have proven to be crucial for a large majority of high performing employees. These are:

- Culture
- Pay and benefits
- Leadership and management
- Performance management, growth and development.

Only two of these four factors form a crucial part of the employer brands of majority companies:

- A highly developed culture and outstanding leadership
- Management qualities.

3. BRAND MISALIGNMENTS

Most employer brands fail to recognize the importance of "performance management, growth and development" and "pay and benefits," respectively. Delving more deeply into these factors shows where highest misalignments occur. High performers expect:

- Multiple career paths to be open to them
- Supervisors to ask them for feedback
- Regular feedback on their own performance
- A transparent system for determining variable pay.

Most of the employers do not regard these as crucial elements of their employer brand. However, high performers show considerable expectation for their compensation. High performers consider base pay to be the most important part of their compensation package. Interestingly, employees who have high expectations of growth and development opportunities consider variable components of compensation almost as important as base pay, whereas other employees have far greater interest in base pay. High performers believe that their efforts and contributions to the company should be remunerated far above average compensation levels.

4. IS THERE A PATTERN IN EMPLOYEE EXPECTATIONS?

As "quality of leadership and management," "culture," "pay and benefits" and "growth and development opportunities" are considered to be the most important factors within the employment deal for a vast majority of high-performing employees, is there any pattern in these? Research shows that "Culture" and "leadership and management" are factors that prove to be significantly correlated to each other. Employees who have great interest in culture tend to have high expectations in the quality of leadership and management. A culture that is neither well developed nor aligned with the company's leadership and management practices is unlikely to appeal to a high performer.

5. PRIORITIES OF EMPLOYERS OF CHOICE

Employers of choice have built much of their standing on their reputation as "exciting places to work." They regard their reputation as an essential part of their employer brand and tout this image among graduating classes and in the job market. But there is more to their success than mere smart publicity campaign. The brands of the employers of choice have much higher congruence with the employment deal expectations of their high performers. This holds especially true for the high quality of their "culture" and the good quality of their "leadership and management." Most companies only partially meet the expectations of their most valuable employees. Answers to the following questions can avoid such a mismatch. They build a basis on which an employer brand can be built successfully:

- What types of employees are fundamental to the success of the business?
- What do the high-performing employees expect from the company?

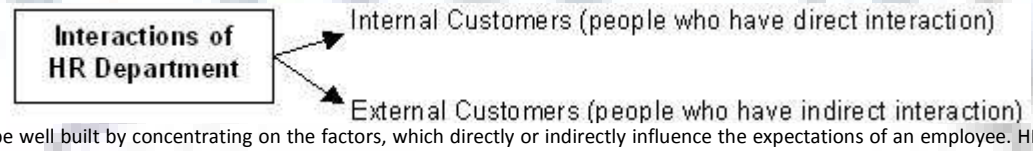
Answering the above questions enables the employer to build a brand that reflects its business and culture and is attractive to targeted employees. Besides the company needs to share and live the brand. The employer brand may not remain a secret for HR professionals, but should be widely disseminated and shared within and outside the company. The employers of choice have proven that well-developed employer brands help attract and retain talent. A strong employer brand shows what a powerful means of differentiation an employer branding can be. It can be thus be concluded that a remarkable reputation, perception and image in the job market builds on both the attractiveness in factors that are of fundamental importance to high performers as well as elaborate efforts, which make this attractiveness visible in the job market.

As the functions of HR started spreading across the organization, the services rendered by the HR department to the employees can be treated as the same thing as selling services to the external customer. Hence, the HR department should care about its brand identity.

For a company to be successful, it has to attract, motivate and retain the best and brightest, making it competitive in the race. As organizations are complex, open systems, single interventions are not enough. The best organizations have compelling people strategies that are perfectly aligned with the organization's business strategy. Once the people strategy is aligned with the business strategy, you can begin creating a great place to work. The HR brand has to be aligned congruently with what the company delivers to the employee, customer, public and shareholder.

In today's knowledge driven economy, HR plays a strategic role in bringing in the right kind of people into the organisation. In a sense, HR is the first face of an organisation for a new prospective employee. Market research has revealed that strong brands contribute to strong competitive presence. In this way, the HR in its new avatar, the importance of branding HR follows quite as a corollary.

The challenge faced while structuring the brand is to establish new deliverables to sustain strong partnerships with both internal and external customers. The ability to see the big picture and to deploy the resources to address to this big picture will be more important than ever, based on the interactions of HR department with both internal and external customers.



The brand 'HR' can be well built by concentrating on the factors, which directly or indirectly influence the expectations of an employee. HR department should take decisions that would not discourage employees from being aligned to the brand behavior.

Initially, we have to build a brand internally that is possible by making high participation of internal customers in benefit plans, training programs and company functions. Greater the acceptance of performance plans, compensation programs, and policies and procedures, employee assistance programs, meditation services lead to higher satisfaction ratings on employee attitude surveys.

If an organisation wants its brand to be perceived as more strategic, more valuable, more reliable, one needs to think about what internal and external customers expect from them, how well they can deliver it, and how to progress. This isn't achieved by fancy packages, catchy slogans and name changes, either. This is achieved by thinking like a business with a product to be developed, marketed and reliably delivered to customers who want your services.

5.1. HR- THE GOOD MANAGER

"HR is business and business is HR. Hence, people are business," said Manoj Kohli, President and CEO, Bharti Airtel, in his keynote speech during the inaugural session of the forum. He expressed that one does not need capital, brand or technology to succeed - one needs people to succeed. He said, "HR should be more of a line management function rather than staff function. It should act as a designer. HR has grown well in the last two decades and it is its main duty to convert

vision and values into reality. The most important role of HR today is to be a custodian of culture; it builds the DNA for every company." He also added that the leadership pipeline is a key matter of concern for HR these days. "Only 10-20 per cent of leadership should be brought in from outside. The rest should be promoted from within the organisation," he said.

5.2. HR- THE GOOD COMMUNICATOR

The key to a successful enterprise is good communication and it is necessary that every employer takes the effort to communicate about the brand with his/her employees. Richard Rekhy, Chief Operating Officer, KPMG, moderated the CEOs Roundtable by talking about how imperative it is to communicate one's brand. He said, "HR needs to take a proactive role now. These days, the employee decides whom he/she works with. We need to look into why the rate of attrition is so high. I feel that this happens when an employee does not 'trust' the organisation. Pradipta Sen, Managing Director, Emerson India, carried the discussion forward by expressing, "We have to show our employees the value of our offering. Do we deliver what we have promised? We can influence values, we cannot influence culture."

"Brand is an outcome or residue of action. The employee is no longer called an employee - we have to redefine the nomenclature also," communicated P Rajendran, Director and COO, NIIT. "Word of mouth is most important in creating a brand. Emotional ownership of the company/brand is most essential in employer branding," Rajendran added.

For Ashish Taneja, Chief Executive Officer, Vertex India, it is vital for an organisation to position itself within and outside. "Organisations cannot be 'me too' type of brands. Each has to have its unique branding," he said. Adding more to the discussion, Ashish Gupta, COO, Evalueserve articulated, "The biggest challenge for HR is to create leaders for tomorrow and fight attrition. Our values represent our brand and communication is the most important aspect of employer branding."

5.3. HR- THE GOOD MULTI-TASKER

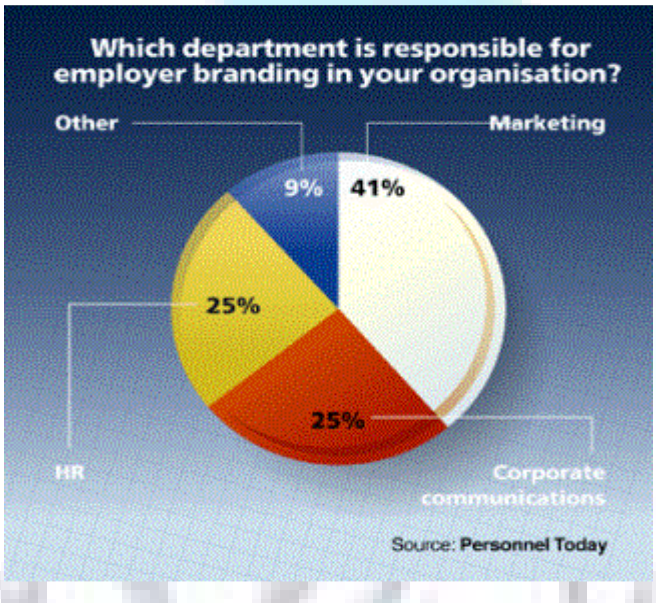
For ages, companies have been merged and demerged. While the idea is an exciting one, the impact of this is usually seen after the change. Rajan Wadhawan, Executive Director, PricewaterhouseCoopers, brought life into the discussion by initiating the dialogue on the impact of merging or de-merging a company. Wadhawan expressed, "Most companies look forward to mergers with big international or national companies but there are too many factors which contribute in order to make the merger successful."

Aadesh Goyal, Centre Head Gurgaon and VP-HR, having witnessed 13 mergers and de-mergers in his organisation in just 5 years, informed, "HR plays an indispensable part during and after the process of mergers and de-mergers. Bringing together two companies from two different countries or backgrounds is a very crucial task for the HR people."

Dr Yashovardhan Verma, Director - HR, LG Electronics, added, "It is difficult to change your style of working and perception and mould into a brand new setup for many organisations. That is why we come across many mergers which have proved to be failures."

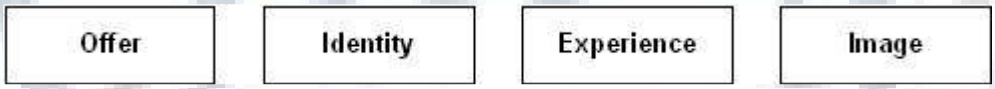
Ashok Jambur, Chief Human Resource Manager, Indian Oil Corporation, expressed, "Employees of the organisation stepping into a merger are very apprehensive as to how the other company would treat them or what kind of changes would have to be done. Hence, HR has to very meticulously plan a merger or a de-merger."

5.4. RISE IN IMPORTANCE OF HR BRANDING



6. BRAND AS A SYSTEM

We can consider brand as a system. The brand system has four components which are inextricably tied and interdependent.



6.1. OFFER: It is the service or a group of services that the brand renders to its customers, and if the offer is complex or it is difficult to explain, then it would be very difficult to communicate the offer to the target segment. Hence, the offer should be clearly described for a brand to be successful.

Example: Compensation packages, Training programs, Employee assistance programs, a good working environment, etc.

6.2. IDENTITY: Identity is defined as every thing that assists in attracting attention, setting expectations and making an impression. Names, logos, slogans, advertising, packaging, vision and mission statement of the HR department, make up the brand identity. This provides information to employees to determine an impression on the HR department.

6.3. EXPERIENCE: Brand experience is the aggregate of all the perceptions that result from the interactions with a brand. But all the experiences are not equal. Employees assign different levels of importance to different facets of their experience.

6.4. IMAGE: Brand Image is what people think of the brand. This is primarily based on the interactions with the HR department.

7. STEPS INVOLVED IN BRANDING

7.1. SCHEMING A STRATEGY TOWARDS DEVELOPMENT OF MISSION STATEMENT

Once the needs and current perceptions of your existing customers are determined, then the way the HR department is perceived can be changed.

All HR departments wish they could be strategic. But this may not be the most appropriate goal for every HR department in every company. In some companies, internal customers may want the HR department to provide great service in all the traditional HR areas. In many companies, customers may expect HR to take responsibility for productivity growth. You have to decide what brand identity works best for your particular culture and then work to create a mission statement and an organization that supports that identity.

HR professionals should take time to decide what works best for their particular customers. Developing a brand is all about making tough decisions as to what you will and will not stand for. In your company, for example, it may make sense to outsource routine tasks such as payroll processing so that existing HR people can concentrate on more strategic issues. To develop a solid brand identity you shouldn't be all things to all people.

Once you determine what your brand identity will be, take some time to craft a mission statement that will guide you through all the improvements that need to be made. The statement should define the mission of the HR function, the values and core principles the department will uphold, and the benefits.

The mission statement is important because it helps to define the future you wish to gravitate toward. We call this 'aspirational branding'.

7.2. MONITOR THE CHANGE PERFORMING GAP ANALYSIS

Based on customer input, your HR department needs to do a better job by providing good services. Whether it s hiring employees or conducting team-building sessions, customers want you to be more responsive and pleasant to deal with. Because branding is about delivering a promise, we must ensure that people, practices and systems in the HR department all work to support the goal of customer service. There has to be an alignment between the brand promise and what you actually deliver.

Just as the company does not hire retired men in leisure suits to sell its hip, young clothing, we should not staff people who are unwilling to go the extra mile for line managers. For a brand identity to work, the systems must provide itself with back-ups.

7.3. ACT THE TALK

In the world of consumer goods, a product without a distinctive logo, slogan and type of packaging would become standstill. For example, a can of Coors beer looks very different from a can of Coca-Cola. These companies understand that the look and feel of their products communicate strong, albeit subtle messages to consumers

Does it make sense for the HR department to create its own logo and slogan? Is the look of the HR department itself important in communicating brand identity? Packaging is an extremely valuable way to communicate and reinforce what a brand is about, but it would not work unless there is substance behind it.

If your HR department has made substantial improvements, then the new look can be a way of communicating those improvements to others.

For example, as told by Shiv Balan, Head of HR at GMR Group, more than 80 percent of stored memory comes from the visual sense. "What you see, you remember, more so than any of the other senses." Consumer companies understand this, and that's why they spend enormous sums developing logos with memorable type, images and color.

If you think developing a separate logo for your HR department will make it stand out and get noticed, there s no harm in it. A verbal tag-line can also be an effective tool in getting your message across. But probably the most important packaging item is the HR department itself.

"Branding is not just about a label, logo, name, environment or color." More to the point a service brand HR is about people. It is all about how those people act, talk and treat others. You could spend millions of dollars redesigning your department, developing a logo and tag-line, and communicating the new brand identity, but if the people in HR are impossible to deal with, forget it. Your accomplishment is nothing.

7.4. FLATTER A LOT

The most important step that needs to be followed once we determined what the brand identity is, to create a system in which you can consistently deliver the brand's promise, and you have packaged the department in such a way as to subtly communicate the improvements that have been made. Now is the time to begin tooting your horn.

However, unlike Pizza Hut or Nike, HR doesn't have the opportunity to use paid advertising to get its message across. A better way to communicate the new brand identity is by taking advantage of tried-and-true public-relations techniques.

For example, if you want human resources to be perceived as strategic, take time to quantify the strategic impact of a recent HR decision, or find an anecdote that shows how HR contributed to the strategic direction of the company by communicating those messages in board meetings, through the company newsletter or by developing special "HR Performance Reports". The key thing is to back up the overall.

Be sure to use language that employees will understand. "Don’t get so caught up in HR jargon or terminology that you end up losing the audience," he warns, "Craft messages that speak to the recipient, not to you."

7.5. ENHANCE YOUR VISIBILITY

Another PR technique that will help you to spread the good word about HR is to be as visible as you can - not only within your own company, but also in the larger world of human resources. Reach out to magazines and speak at HR conferences. This gives external validation for the brand changes you have made internally - and sometimes that's what it takes to get managers to pay attention.

7.6. NO LOOKING BACK

As HR struggles to gain a foothold in the rapidly changing world of business, the profession must regularly subject itself to self-scrutiny and be willing to make tough choices about what it will and will not stand for. The HR brand is in transition, but with careful attention the brand can harness an identity, learn to compete with external vendors and provide what customers expect.

The trick is to remember that branding is not a paint job. You can't dress up the HR department in new colors and expect people to believe everything has changed. Branding is only convincing, credible and effective, if it reflects changes in substance.

So pull out your Palm Pilot, PowerBook or Parker ball point and make a note to yourself - "The brand strategy works and HR can take advantage of it."

8. A SHARED RESPONSIBILITY IS ARISING

It is no secret that success in business relies upon excellence in execution. While corporate leaders have historically looked to other functions, such as product development, marketing, and sales, to drive corporate success, today more and more eyes are looking to HR for help.

The reason for this newfound reliance on HR stems from a decrease in the effectiveness of the traditional levers marketing organizations used to differentiate a firm and their products. Marketers have traditionally used "the 4 P's" (product, price, position, and promotion) to set the products of their firm apart from those of the competitor in the market place. However, in the new economy, product features, pricing, and positioning become almost irrelevant as competitors can now mimic and upstage your efforts in very short periods of time, thanks in part to innovations in technology and reductions in global barriers.

While this development forces marketing to become more and more branding oriented, it also forces corporate attention on other avenues that can be used to establish and maintain a corporate brand in the marketplace.

Most corporate leaders and professional marketers now admit that one of the few (if not the only) channels left to communicate the corporate brand to customers is the employee, and the customer experience they are capable of providing. Customer service is a factor that is largely influenced by the quality of the workforce, which in turn is largely influenced by the quality of recruiting and workforce management systems developed and maintained by HR.

9. YOUR WORKFORCE LIVES YOUR BRAND

Companies opting to distinguish themselves in the market through customer service require a workforce capable of providing a notable positive difference in customer experience versus that which a competitor can provide. Providing such an experience as a means to communicate and support your corporate brand requires several key factors be in place, including:

A workforce that understands the customer service distinction you are attempting to provide, and that believes in providing it.

An environment that actually lets the workforce live the brand which you are trying to build (most firms really screw this one up).

Each year, companies spend billions of dollars crafting corporate branding or "identity" strategies. They update their mission and values statements, then work with marketers and advertisers to fine-tune and communicate the new perspective to customers. In many companies, the value statements are posted publicly at every facility to remind employees and communicate to customers what attributes matter most to the company.

Where most companies routinely fail is in managing the impact employees have on making a brand more than words on paper.

In every industry, employees serve as the primary "channel" used to characterize the brand during direct contact with the customer. But in most companies, employees don't understand the corporate brand elements or what is needed from them in order to help customers experience the difference.

To make matters worse, many organizations have developed standard operating procedures, policies, and reward systems that drive behaviors directly in opposition to the brand values. I think it is pretty safe to say that, at some point in time, every person reading this has experienced customer service that seemed to contradict the perspective created by corporate advertising.

10. WHY HR HAS TO GET INVOLVED AND HIT A HOME RUN

Those readers who know me understand that I rarely get impassioned about any issue that cannot be directly correlated to the bottom line, and this one is no exception. Consumers have numerous choices, and no HR focus will impact the corporate bottom line more than making sure we help our firm keep our customers and gain new ones.

Gallup research of 300,000 businesses indicates that consumers who felt fast food restaurant employees did a great job were five to six times more likely to come back to that brand. At banks where employees stood out, the customer was 6 to 20 times more likely to continue the relationship. That's strategic impact!

11. WHAT NEEDS TO BE DONE

There are a lot of things that need to be accomplished in HR before HR programs and practices can begin supporting the corporate brand. The list is immense, but some recommended starting points follow:

Stop executing HR in a vacuum. Managing the most valuable corporate asset in a world-class way requires cooperation with marketing and finance.

Identify where your standard operating procedures, policies, and reward systems contradict the customer experience your corporate brand depends upon, and fix them. (Every company should find at least one major contradiction. If you are having problems, look at how you provide bonus compensation.)

Measure the success of your recruiting and training initiatives based on the customer perception of the quality of your workforce; after all, it is their opinion that matters most!

Identify how your employees perceive your organization, and compare that to how you want customers to perceive your organization. If there is a disconnect, it must be resolved. (Note that resolution does not mean telling the employee they are wrong! Branding relies upon their perception, not yours.)

12. BENEFITS OF BUILDING A BRAND FOR HR DEPARTMENT

12.1. It improves credibility and strengthens the bonds of trust between HR department and the employees.
12.2. It acts as a catalyst for pushing change.
12.3. It is communications shorthand for getting the message out.

13. LIMITATIONS

13.1. Employees perception at all times is not same.
13.2. There is no appropriate method for prioritizing things.
13.3. People may not have proper knowledge towards branding.
13.4. Marketing and branding always overlap and create confusion.

14. CONCLUSION

Why do we go for brands? The answer is simple - reliability. Its the popular brands which provide this reliability. Attracting knowledge workers has become a Herculean task for the HR department. Only the best practices and the best environment can assure their interest in working for your organization. The practices and policies of the HR department and its outlook create a certain brand for the HR. The better the brand, better are the chances that you attract the best talent. The focus in our paper outlines all that are required to make HR the best brand.

You and I both know that corporate branding initiatives are created in a vacuum, and not always based upon reality, or the ability of our firm to live up to the image created.

Unfortunately, failing to follow through on a promise put forth by our brand, either stated or implied, is one of the easiest and most effective ways to drive customers away and revenues down.

Branding initiatives should always have the customer as their primary focus, and focus on their needs and wants. In some cases, the customer is internal, in other cases external. Branding can be used to accomplish a variety of challenges, but success depends upon follow through, and that depends upon the quality of your workforce and their ability to deliver.

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BUYING BEHAVIOUR OF CONSUMERS WITH REGARD TO SOFT DRINKS WITH REFERENCE TO COIMBATORE CITY

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ABSTRACT

The Soft drinks market has been continuously changing since last decade, with a shifting pattern in consumer preferences for soft drinks and also to pace out the cut throat competition prevailing in today's environment. While manufacturers has to be on the toe always to analyze the changing needs and preference of the consumers which is based on the habits and surroundings inherited by them. The present study focuses on the factors influencing the changes in the soft drink industry. The soft drinks industry is highly competitive, with not only competing with each other but also with the other industry. With regards to this, the study basically tries to investigate the factors influencing the consumption of soft drinks, to analyse the relationship between age categories and brand preference and to find out the important attributes for buying a single brand soft drink.

KEYWORDS
Buying behaviour, consumer preferences.

INTRODUCTION

Buying behaviour is complex and influenced by many factors, some of which may conflict with so-called rational decision making. The interactions of groups and personal behaviour, the interrelationships between attitudes and behaviour, the challenge of authority and status, and the profound, and sometimes subtle, effects of culture on consumption make up, in part, the intricate web of influences which surrounds patterns of consumption.

Peter M.Chisnall (1995)

In the earlier years, consumers shopped to satisfy their needs and wants but today their taste and preferences have changed. This makes it clear that studying buying behaviour of consumers is utmost important to capture the market share and to build brand loyalty. The overall purpose of this paper is to gain a deeper understanding of consumer preferences for soft drinks and also to analyze factors influencing on their buying decisions. The study takes into account the familiar brands of entire soft drink industry.

Soft drinks have become part and parcel of our day to day lifestyle. Each and everyone in the country enjoy drinking a soft drink may it be a children, or a college student or a housewife or the old aged. With the coming up of more eat outs the popularity for soft drinks has also grown as food like pizzas, burgers and French fries go hand in hand with soft drinks.

Gone are the days when one used to have a soft drink just to combat a sunny day. But today with the lifestyle changes, soft drinks are enjoyed with almost every meal that one has outside his/her home. Despite various issues that prop up regarding the ingredients used in manufacturing of soft drinks the market for it remained stable. The soft drink industry in India is categorized on the basis of production of carbonated and non carbonated drinks. The carbonated drinks include flavors like cola, lemon and orange and the non carbonated drinks segment includes mostly mango, pineapple, litchi flavors. The Top Soft Drink Brands in India are Coca-Cola, Pepsi and Thumps Up. In order to cater to all the segments of the society these top soft drink brands are available in numerous sizes.

Soft drinks not only rule the urban markets, they have successfully managed to penetrate the rural areas as well. Rural areas account for almost 75% sales of Pet bottles whereas the sales of 300ml and 200 ml bottles are higher in the rural areas.

According to the sources of Ministry of Food Processing industry, "Soft drinks is the absolute stand-out industry in the world, with global soft drinks market set to expand by a further 6% compounded annual growth rate between 2012 and 2016. The US was the top country by retail sales as well as by number of new product launches, followed by Japan which ranked second in both categories whereas India ranked 25th in terms of retail sales and 13th in terms of the number of new product production in the soft drinks market in 2009.From 1976 – 1989, the industry only comprised of Indian manufacturers namely, Parle, Campa-Cola and Dukes. Decades of 90's have brought changes in Government policies of liberalization, which has helped user two huge American Multinational Coca-Cola and Pepsi-Cola international to enter the market.

The 50-billion-rupee soft drink industry is growing now at 6 to 7% annually. In India, Coke and Pepsi have a combined market share of around 95% directly or through franchisees. Campa Cola (a brand in 1970s by Pure Drinks India Limited, shutted its operation in 2000 has come out with their operations by manufacturing drinks without a fizz) has a 1% share, and the rest is divided among local players. Industry watchers say, fake products also account for a good share of the balance.

The industry estimates that the beverage market should grow at twice the rate of GDP growth. The Indian market should have, therefore, grown by at least 12%. However, it has been growing at a rate of about 6%. In contrast, the Chinese market grew by 16% a year, while the Russian market expanded rapidly four times the rate of growth of the Indian market. With 35% annual CAGR in India, Coca-Cola remains the market leader in the carbonates category with a market share of more than 58.3% in the Indian Market, followed by Pepsi with around 35%. The packaged juices market in India continues to be dominated by Maaza and Frooti, followed by brands such as Slice, Tropicana and Real which have registered good growths in their market shares in the past few years. Red bull with its strong dominance of the energy drinks category, which is the largest segment in the functional drinks category, is the market leader in the functional drinks market".

MARKET SIZE AND GROWTH

- Cola products account for nearly 60% of the total soft drinks market.
- Two global majors' Pepsi and coke dominate the soft drink market.
- The market is worth around Rs.50 billion with growth rate of around10-15 %.
- Growth market this year is expected to be 10-15% in value terms and 20-22% in volume terms.

LITERATURE REVIEW

Aaker (2000) regarded brand awareness as a remarkably durable and sustainable asset. It provided a sense of familiarity (especially in low- involvement products such as soaps), a sense of presence or commitment and substance and it was very important to recall at the time of purchasing process. Apart from the conventional mass media, there were other effective means to create awareness viz., event promotions, publicity, sampling and other attention-getting approaches.

Banumathy and Hemameena (2006), while studying consumer brand preference with respect to soft drinks, found that after globalization most of the consumers like the international brands such as Pepsi and coco-cola. Consumers preferred a certain brand or a particular drink mainly because of its taste and refreshing ability.

Brown et al. (2000) reported that the need for effective nutritional education for young consumers has become increasingly apparent, given their general food habits and behaviour, particularly during adolescence and analyzed that the interaction between young consumers' food preferences and their nutritional awareness behaviour, within three environments (home, school and social). The results indicated that the perceived dominance of home, school and social interaction appears to be somewhat overshadowed by the young consumers, while developing an 'independence' trait, particularly during the adolescent years. The authors suggested that food preferences are often of a 'fast food' type and consequently the food habits of many young consumers may fuel the consumption of poorly nutritionally balanced meals. While young consumers were aware of healthy eating, their food preference behaviour did not always appear to reflect such knowledge, particularly within the school and social environments.

Nandagopal and Chinnaiyan (2003) concluded that the level of awareness among the rural consumers about the brand of soft drinks was high which was indicated by the mode of purchase of the soft drinks by "Brand Name". The major source of brand awareness was word of mouth followed by advertisements, family members, relatives and friends.

Nandagopal and Chinnaiyan (2003) conducted a study on brand preference of soft drinks in rural Tamil Nadu, using Garrets ranking technique, to rank factors influencing the soft drinks preferred by rural consumer. They found that, the product quality was ranked as first, followed by retail price. Good quality and availability were the main factors, which influenced the rural consumers of a particular brand of a product.

Shanmugasundaram (1990) studied about soft drink preference in Vellore town of north Arcot district in Tamil Nadu. The study revealed that, the most preferred soft drink among respondents as Gold Spot (26%), followed by Limca (24.80%). It was found that taste was the main factor for preference of particular brand and among the media; television played a vital role in influencing consumer to go for particular brand. Because of convenience in carrying, tetra pack was most preferred one.

Tudor Edu & et. (2013) concluded that the consumer is in the centre of any marketing endeavour. Finding out what the consumers (individual or organization) need, desire and demand is the starting point of a marketing approach. Our research is focused on determining consumer behaviour coordinates pertaining to cool drinks amongst South Africans under the age of 35. The findings of this study provide significant information concerning the buying motives considered when purchasing cool drinks which can be extended to other categories of merchandise. The findings show that the consumer behaviour of cool drinks amongst the young South Africans is a complex one. The respondents displayed a tendency towards objective buying decisions but between a collection of brands for which a certain degree of loyalty was shown.

OBJECTIVES OF THE STUDY

- To investigate the factors influencing the consumption of soft drinks.
- To analyse the relationship between age categories and brand preference.
- To find out the important attributes for buying a single brand soft drink.

RESEARCH METHODOLOGY

The survey was conducted in Coimbatore based upon the structured questionnaire. Questions were closed - ended and ranking based. Based on simple random survey 50 respondents were selected in Coimbatore city. Questionnaire has been prepared to capture the opinions/attitudes and beliefs of the respondents. For the secondary data various literatures, books, journals, magazines, web links were used.

DATA ANALYSIS

The responses of the respondents were codified, checked for the consistency of the codification and wherever needed were edited. The data were calculated using percentage analysis method, One Way ANOVA, Weighted Average Score Method and Henry Garrett Ranking Method.

FINDINGS

- Most of the respondents prefer Coca cola (56%) than Pepsi (40%) and other soft drinks. Some of the consumers preferred Bovonto (1%) for its taste. The product covers mainly the youngsters **(Table: No. 2).**
- Majority of the consumers rarely (58%) go in for consuming a soft drink. Others prefer it once in a week (16%) or once in a month (4%) or even go in for consuming it daily (22%) **(Table: No. 1).**
- Majority of the consumer preferred to buy 200 ml (44%) because it is a small quantity and is easy to consume. Consumers like to consume 200 ml mainly in their work place and also in School/college Canteens. Some of the consumers also buy 1.5/2 litres (5%) bottle. They buy big bottles when they are with their family, special occasions and celebrations.
- Most of the consumers are purchasing the products due to the influence of advertisements, few others because of friends and some of them are buying soft drinks influenced by the stars endorsing the drink.
- The following null hypothesis has been formed in order to find out the relationship between Age Categories and brand preference of a consumer.
  - **H_0: There is no significant relationship between Age categories and Brand Preference.**
  - **H_1: There is significant relationship between Age categories and Brand Preference.**
  - To understand whether the reasons for consumers buying a particular brand of soft drinks were dependent upon age, ANOVA test was run. The results show (Table 3& 4) there is significant relationship between the age groups (F=0.74; 49 and P=0.567). Therefore, Alternate Hypothesis (H_1) gets accepted as there exists a moderate significant relationship between Age categories and Brand Preference. The Post-hoc test was administered on the brand preference to decipher the affect of age variable on the consumer behaviour **(Table No. 3 & 4**).
- Henry Garrett Ranking Table was used to rank the most preferred attribute for a consumer to stick to a particular brand soft drink. It was found from the Ranking Table that Sweetness (Banumathy and Hemameena, 2006**)** was ranked 1 with a mean score of 62.2, Flavour and Colour was ranked 2 with a mean score of 56.46. The symbol of pride was ranked 8 with a mean score of 35.88 and was considered to be the least important attribute for a consumer to stick to a particular brand soft drink. **(Table 5 & 6).**
- Weighted Average Score table was used to weight the most influencing factor for consumption of soft drink. It was found from the Weighted mean score that consumers are influenced to drink soft drinks mainly when they have an entertainment or in a social occasion (39.6), they also take it as a refreshment (38.2) and the least considered factor was to relax oneself (28.4). **(Table No. 7 & 8)**
- Majority of consumers if given a chance to consume fresh juice or fruit juice instead of aerated soft drinks, respondents would prefer to buy either of these than to a soft drink; this relates people are more health conscious.
- Most of the consumers are consuming soft drinks when they are at home (40%) or in restaurants (25%). Some of the consumers are consuming soft drinks at their working premises (10%) or at school or at college canteens (7%).

- Majority of the respondents are aware of the health issues in drinking a soft drink like Obesity (14%), Diabetes (42%), Dental Cavities (44%) and others.

SUGGESTIONS

- The company must be aware of and keep at least the latest knowledge of its primary competitors in market and try to make perfect efforts to meet the same. The company should also use time to time some new attractive system of advertisement to keep alive the general awareness in the whole market as a whole.
- The company should be always in a position to receive continuous feedback and suggestions from its consumers
- Frequent consumption of soft drink will cause health problems which people should also be made aware as done for other products like Cigarettes which specifies "Smoking is injurious to health".
- Advertisement acts as a very important role here. So if heavy advertisements are carried out it will definitely increase purchase and in turn increase the revenue. This could be done by way of "GIVEAWAYS" as it can act as an attention grabber if they are done well, it can give top-of-mind awareness and gets your name in front of people.
- Prices can be reduced to increase the sales, since the consumers are aware that they are charged higher than the price of the drink. Due to the high cost of soft drinks, many times consumers prefer other beverages like tea, coffee or other drinks like sherbet and squashes.

CONCLUSION

- It could be concluded that Coca-cola is most popular amongst its users mainly because of its brand name, innovativeness and the kind of star Endorsements used by them. Thus it should focus on good taste as respondents preferred Pepsi for taste.
- The visibility of any product plays an important role in making the customer aware about of the product and is vital for the growth and development of any product.
- The companies can also try and bring in some drinks which are more of ethnic oriented as KFC which brought in Curry crunchy chicken to bring in the taste of Indian Cuisine.
- The majority of the people are aware of the health hazards of consuming soft drinks, therefore the companies can bring in more flavoured and non-carbonated soft drinks in the market to increase the consumption pattern.

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APPENDIX

TABLE NO. 1

Favourite Soft drink	No. of. Respondents	Percentage
Bovonto	1	2
Coke	28	56
Pepsi	1	2
Others	20	40
Total	50	100

FIGURE NO. 1

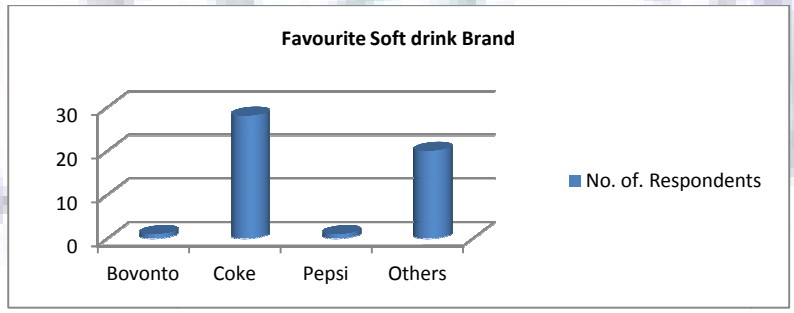

TABLE NO. 2

Consumption	No. of. Respondents	Percentage
Once in a week	8	16
Once in a month	2	4
Daily	11	22
Rarely	29	58
Total	50	100

ANOVA

TABLE NO. 3: BRAND LOYALTY FACTORS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.04	4	1.01	0.74	0.567
Within Groups	61.08	45	1.357		
Total	65.12	49			

The mean difference is significant at 0.05 level

TABLE NO. 4

Dependent Variable	(I) Age of Respondents	(J) Age of Respondents	Mean Difference (I-J)	Standard Error	Sig.	95% Confidence Level	
						Lower Bound	Upper Bound
Brand Loyalty	Less than 20	21-30	-0.102	0.624	0.871	-1.4	1.16
		31-40	-0.173	0.666	0.796	-1.5	1.17
		41-50	0.75	0.89	0.404	-1	2.54
		Above 50	0.75	0.89	0.404	-1	2.54
	21-30	Less than 20	0.102	0.624	0.871	-1.2	1.36
		31-40	-0.071	0.393	0.857	-0.9	0.72
		41-50	0.852	0.709	0.236	-0.6	2.28
		Above 50	0.852	0.709	0.236	-0.6	2.28
	31-40	Less than 20	0.173	0.666	0.796	-1.2	1.51
		21-30	0.071	0.393	0.857	-0.7	0.86
		41-50	0.923	0.746	0.223	-0.6	2.43
		Above 50	0.923	0.746	0.223	-0.6	2.43
	41-50	Less than 20	-0.75	0.89	0.404	-2.5	1.04
		21-30	-0.852	0.709	0.236	-2.3	0.58
		31-40	-0.923	0.746	0.223	-2.4	0.58
		Above 50	0	0.951	1	-1.9	1.92
	Above 50	Less than 20	-0.75	0.89	0.404	-2.5	1.04
		21-30	-0.852	0.709	0.236	-2.3	0.58
		31-40	-0.923	0.746	0.223	-2.4	0.58
		41-50	0	0.951	1	-1.9	1.92

TABLE NO. 5: MOST PREFERRED ATTRIBUTE FOR A CONSUMER TO STICK TO A PARTICULAR BRAND SOFT DRINK – HENRY GARRETT RANKING

ATTRIBUTE	I	II	III	IV	V	VI	VII	VIII	IX	TOTAL
FLAVOUR & COLOUR	4	9	8	11	6	6	4	1	1	50
NUTRITIONAL VALUE	6	5	2	7	10	7	4	7	2	50
SWEETNESS	20	1	10	3	3	6	4	1	2	50
STAR ENDORSEMENTS	0	3	2	2	5	8	5	13	12	50
FIZZ	0	6	4	5	6	7	6	6	10	50
PRICE	4	13	6	5	2	6	4	4	6	50
VARIETY	1	3	7	7	8	5	10	9	0	50
SYMBOL OF PRIDE	0	2	4	1	6	3	10	7	17	50
GARRETT PERCENTAGE	5.56	16.67	27.78	38.89	50	61.11	72.22	83.33	94.44	
GARRETT SCORE	81	69	62	56	50	44	38	31	19	

TABLE NO. 6: HENRY GARRETT RANKING TABLE (Most Preferred Attribute For A Consumer To Stick To A Particular Brand Soft Drink)

FACTORS	I	II	III	IV	V	VI	VII	VIII	IX	TOTAL SCORE	MEAN SCORE	RANK
FLAVOUR & COLOUR	324	621	496	616	300	264	152	31	19	2823	56.46	2
NUTRITIONAL VALUE	486	345	124	392	500	308	152	217	38	2562	51.24	4
SWEETNESS	1620	69	620	168	150	264	152	31	38	3112	62.24	**1**
STAR ENDORSEMENTS	0	207	124	112	250	352	190	403	228	1866	37.32	7
FIZZ	0	414	248	280	300	308	228	186	190	2154	43.08	6
PRICE	324	897	372	280	100	264	152	124	114	2627	52.54	3
VARIETY	81	207	434	392	400	220	380	279	0	2393	47.86	5
SYMBOL OF PRIDE	0	138	248	56	300	132	380	217	323	1794	35.88	**8**

TABLE NO. 7

Influencing Factors	**SA**	**A**	**N**	**DA**	**SDA**
Social Occasion/Entertainment	16	22	8	2	2
Refreshment	10	23	15	2	0
Enjoyment	6	23	17	3	1
Taste	8	25	9	8	0
Satisfying thirst	9	17	13	8	3
Energy	3	11	20	8	8
Relaxes mentally	4	11	15	13	7
Reflex my attitude	2	18	12	8	10

TABLE NO. 8: SHOWING WEIGHTED AVERAGE SCORE

Influencing Factors	SA	A	N	DA	SDA	TOTAL SCORE	MEAN SCORE
Social Occasion/Entertainment	80	88	24	4	2	198	**39.6**
Refreshment	50	92	45	4	0	191	38.2
Enjoyment	30	92	51	6	1	180	36
Taste	40	100	27	16	0	183	36.66
Satisfying thirst	45	68	39	16	3	171	34.2
Energy	15	44	60	16	8	143	28.6
Relaxes mentally	20	44	45	26	7	142	**28.4**
Reflects my attitude	10	72	36	16	10	144	28.8

IMPACT OF GLOBAL FINANCIAL CRISIS ON THE FINANCIAL PERFORMANCE OF SELECTED PUBLIC SECTOR BANKS IN INDIA

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ABSTRACT

Banks act as important players in the financial markets. They play a vital role in the economy of a country. The Recession that began in December 2007 impacted the revenues and profitability of businesses worldwide. We are in a globalised world and no more immune to the things happening outside our country. Built on strong financial fundamentals, strict vigil on risk appetite and firm monetary guidelines, Indian banks have proved among the most resilient and sound banking institutions in the world. But there has been considerable divergence in the performance of the various banking institutions in the country as also among the public, private and foreign banks operating in India. The Indian banking system is relatively insulated from the factors leading to the turmoil in the global banking industry. Going by the performance for the calendar year 2008, Indian public sector banks have not only been able to weather the storm of global recession but have been able to moderate its impact on the Indian economy as well, compared to its peers among the foreign and private banks. The banking sector faces profitability pressures due to higher funding costs, mark-to-market requirements on investment portfolios, and asset quality pressures due to a slowing economy. But Indian banks' global exposure is relatively small, with international assets at about 6 per cent of the total assets. The strong economic growth in the past, low defaulter ratio, absence of complex financial products, regular intervention by central bank, proactive adjustment of monetary policy and so called close banking culture has favored the banking industry in India in recent global financial turmoil.

KEYWORDS
global financial crisis, public sector banks, financial performance.

INTRODUCTION

Banks act as important players in the financial markets. They play a vital role in the economy of a country. The Recession that began in December 2007 impacted the revenues and profitability of businesses worldwide. We are in a globalised world and no more immune to the things happening outside our country. Built on strong financial fundamentals, strict vigil on risk appetite and firm monetary guidelines, Indian banks have proved among the most resilient and sound banking institutions in the world. But there has been considerable divergence in the performance of the various banking institutions in the country as also among the public, private and foreign banks operating in India. The Indian banking system is relatively insulated from the factors leading to the turmoil in the global banking industry. Going by the performance for the calendar year 2008, Indian public sector banks have not only been able to weather the storm of global recession but have been able to moderate its impact on the Indian economy as well, compared to its peers among the foreign and private banks. The banking sector faces profitability pressures due to higher funding costs, mark-to-market requirements on investment portfolios, and asset quality pressures due to a slowing economy. But Indian banks' global exposure is relatively small, with international assets at about 6 per cent of the total assets. The strong economic growth in the past, low defaulter ratio, absence of complex financial products, regular intervention by central bank, proactive adjustment of monetary policy and so called close banking culture has favored the banking industry in india in recent global financial turmoil.

STATEMENT OF THE PROBLEM

The mismatches between production and consumption and savings and investments are the root causes of any nation's economic crisis. Inadequate growth of consuming power – in line with rapid growth of productive forces – is the basis for the periodic recurrence of demand crisis resulting in economic disorders. In the age of globalization, no nation can keep itself aloof from the world economic volatility and India is no exception. The impact of the Great Recession on India can be divided into: financial and economic impact, and potential long-term geopolitical implications. The instantaneous financial and economic impact can be witnessed in reversal of portfolio equity flows and the associated influence on banking performance especially growth and profitability position. In this background an attempt has been made in this paper to asses the impact of financial crisis on the financial performance of selected public sector banks in India during pre and post recession period.

The purpose of this study, therefore, is to test the empirical relationship between Global Financial Crisis and financial performance of selected public sector banks in India. The study has been, thus, carried out using Indian data. Specifically, the following questions are sought to be answered:

1. Does the earning capacity decline with global financial crisis?

OBJECTIVES OF THE STUDY

The major objective of the study is to analyze the financial performance of selected public sector banks in India during pre and post recession period. The following are the specific objectives of the study.

- To analysis the financial performance in terms of profitability during pre and post recession period
- To access the impact of global recession on the financial performance.
- To examine the determinants of profitability

LITERATURE REVIEW

Vidyakala and Madhuvanthi (2009) explains that the prudential norms adopted by the Indian banking system and the better regulatory framework in the country have helped the banking system remain stronger even during the global meltdown. The banking industry is indirectly affected due to the decrease in exports and drying up of overseas financing. The Indian banking do not have big exposures to subprime market, thus the impact of recession on the Indian banking sector is very small.

Santhosh Ranganath. N and Tulasi Rao.G (2010) in their study "Global and Economic Recession: Impact on Banking Sector in India" found that few Indian banks had invested in the collateralized debt obligations and bonds which had a few underlying entities with sub-prime exposures, but no direct impact on account of direct exposure to the sub-prime market.

Rakhe (2010) analyzed the financial performance of foreign banks in comparison with other bank groups in India during 2002-03 to 2008-09. They found that access to low cost funds, diversification of income and other income to fully finance the operating expenses are the important factors to the higher profitability of foreign banks vis-à-vis other bank groups in India.

Puneet Verma and Sonali Adki (2011) have studied the comparative performance of different bank groups from the era of global recession; they conclude that before the global recession foreign bank group was performing much better than other banking sectors. Private, nationalized and SBI bank group were keeping on performing almost same but certainly better than RRBs for all the period of study.

Goel Shobhit and Bajpai Avinash (2013) in their study ' An impact analysis of global recession on the Indian Banking Sector" hypothesized that the performance of Indian banking industry has not been adversely affected due to world recession. They found that there is no significant impact on the profitability of different group of banks and there is no significant difference between the groups of ban ks with regard to the expansion of loans to the customers.

SCOPE OF THE STUDY

The study confines itself to issues relating to the financial performance of selected public sector banks in India. Any research study can explore only a limited field of knowledge. There are many aspects which need to be researched further. In the present case also, there is considerable scope for further research. The coverage of this study is limited to only five banks of public sector banks in India. This can be further being extended. This study has used financial facts of the selected banks from 2002 to 2013. The financial performance of sample banks during pre and post recession period is evaluated in terms of profitability.

RESEARCH METHODOLOGY

The methodology adopted in the present study regarding period of study, sources of data, sampling design and data analysis have been presented below:

PERIOD OF THE STUDY

This study covers a period of twelve years, six years prior to global recession (from 2001-02 to 2006-07) and six years post recession period (from 2007-08 to 2012-13)

DATA SOURCES

The study is mainly based on secondary data. The data relating to the study was obtained from capitaline database. In addition, the annual reports of the sample banks were also scanned to collect relevant data. Various journals, magazines, newspapers, also have been used to collect the relevant information.

SAMPLE DESIGN

There have been 27 public sector banks are working in India. Out of these the researcher select only in which bank were having continuous data. In this process, those banks which didn't have continuous data are excluded. Finally, the sample size was restricted to five public sector banks in India. The banks selected for the present study are:

1. Bank of Baroda Limited
2. Bank of India Limited
3. Corporation Bank Limited
4. Union Bank of India Limited
5. Vijaya Bank Limited

DATA ANALYSIS

For analyzing data, in addition to important financial ratios, statistical tools like mean, standard deviation, co-efficient of variation, growth, t- test and regression have also been used in the present study.

TABLE 1: TRENDS IN PROFITABILITY RATIO OF BANK OF BARODA DURING PRE AND POST RECESSION PERIOD

Ratios	Period	Mean (%)	SD	CV (%)	Growth (%)	MD	t- Value
II/TF	Pre	7.62	0.81	10.62	-3.82	-0.51	**1.6*** **
	Post	7.11	0.32	4.54	-0.55		
IE/TF	Pre	4.62	0.93	20.15	-5.84	0.01	**0.03**^{ns}
	Post	4.63	0.35	7.58	-0.34		
NII/TF	Pre	1.62	0.44	27.01	-5.77	-0.58	**3.96***
	Post	1.04	0.26	24.89	-9.05		
OE/TF	Pre	2.25	0.14	6.26	-2.35	-0.74	**6.75***
	Post	1.52	0.27	17.80	-7.29		
DPO	Pre	22.07	1.09	4.94	-3.27	-4.47	**1.94*** **
	Post	17.60	2.98	16.95	0.55		
RONW	Pre	15.27	3.53	23.09	0.25	3.77	**2.95****
	Post	19.04	3.63	19.08	-0.04		
ROA	Pre	0.85	0.18	21.79	-1.34	0.15	**1.57*** **
	Post	0.99	0.16	16.25	0.41		

*Note: *1% level of significance, ** 5% level of significance, *** 10% level of significance*

It can be observed from the above table that the operating performance of Bank of Baroda in terms of Interest Income, Non interest income, operating expenses and dividend payout ratio has declined significantly during post recession period, However, it is observed that the overall profitability of the bank have not affected by the global recession.

TABLE 2: TRENDS IN PROFITABILITY RATIO OF BANK OF INDIA DURING PRE AND POST RECESSION PERIOD

Ratios	Period	Mean (%)	SD	CV (%)	Growth (%)	MD	t- Value
II/TF	Pre	7.43	0.79	10.70	-3.41	0.15	**0.57**^{ns}
	Post	7.58	0.43	5.64	-0.22		
IE/TF	Pre	4.74	0.68	14.33	-4.86	0.40	**1.31**^{ns}
	Post	5.14	0.41	7.98	1.20		
NII/TF	Pre	2.68	0.14	5.13	-0.72	-0.24	**2.72****
	Post	2.44	0.23	9.40	-3.35		
OE/TF	Pre	2.18	0.12	5.71	-2.31	-0.69	**19.17***
	Post	1.49	0.15	10.19	-4.24		
DPO	Pre	20.54	5.76	28.03	-6.96	-3.77	**0.99**^{ns}
	Post	16.77	4.60	27.42	13.28		
RONW	Pre	20.19	7.64	37.85	-5.48	-0.83	**0.23**^{ns}
	Post	19.36	7.15	36.91	-6.61		
ROA	Pre	0.65	0.32	49.76	-0.63	0.08	**0.6**^{ns}
	Post	0.73	0.22	30.57	-3.36		

*Note: *1% level of significance, ** 5% level of significance, *** 10% level of significance*

It is observed from the analysis that the profitability of Bank of India has kept on increasing during post recession period but which is not statistically significant. This could not be due to the global recession. The global recession does not have any impact on the financial performance of Bank of India. The overall profitability of BOI was more consistent during post recession than the pre recession period.

TABLE 3: TRENDS IN PROFITABILITY RATIO OF CORPORATION BANK DURING PRE AND POST RECESSION PERIOD

Ratios	Period	Mean (%)	SD	CV (%)	Growth (%)	MD	t- Value
II/TF	Pre	7.79	0.80	10.25	-1.30	0.00	**0.01**^{ns}
	Post	7.79	0.65	8.36	-0.24		
IE/TF	Pre	4.59	0.95	20.77	-2.23	1.07	**1.98*****
	Post	5.65	0.75	13.29	-0.14		
NII/TF	Pre	1.75	0.27	15.26	-3.25	-0.58	**9.25***
	Post	1.16	0.26	22.11	-3.49		
OE/TF	Pre	1.97	0.21	10.84	0.71	-0.69	**5.92***
	Post	1.28	0.13	10.51	-0.98		
DPO	Pre	20.41	4.10	20.11	6.75	0.65	**0.40**^{ns}
	Post	21.07	0.35	1.65	-0.28		
RONW	Pre	16.55	2.63	15.89	-3.11	3.02	**2.33****
	Post	19.57	2.21	11.32	-2.21		
ROA	Pre	1.32	0.28	21.49	-4.12	-0.33	**3.51***
	Post	0.99	0.09	8.94	-4.02		

*Note: *1% level of significance, ** 5% level of significance, *** 10% level of significance*

Table 3 shows that the interest income almost same in both pre and post recession period, it is observed that the Non-Interest Income, Operating Expenses and ROA has declined significantly during post recession period. It is found that there is no significant difference in the average Interest Income and Dividend Payout ratio of CBL during pre and post recession period.

TABLE 4: TRENDS IN PROFITABILITY OF UNION BANK DURING PRE AND POST RECESSION PERIOD

Ratios	Period	Mean (%)	SD	CV (%)	Growth (%)	MD	t- Value
II/TF	Pre	8.32	0.95	11.45	-1.53	-0.13	**0.3**^{ns}
	Post	8.18	0.49	5.98	-0.49		
IE/TF	Pre	5.20	0.86	16.52	-2.21	0.33	**0.91**^{ns}
	Post	5.53	0.49	8.81	-0.55		
NII/TF	Pre	2.12	0.14	6.77	-1.86	-0.54	**5.03***
	Post	1.57	0.15	9.83	1.80		
OE/TF	Pre	21.23	4.52	21.28	2.90	-2.31	**1.44**^{ns}
	Post	18.92	5.06	26.75	3.94		
DPO	Pre	24.14	5.26	21.80	-1.83	-2.34	**1.5*****
	Post	21.80	5.84	26.78	-9.23		
RONW	Pre	0.93	0.20	21.48	-2.46	-0.02	**0.22**^{ns}
	Post	0.91	0.19	21.00	-2.48		
ROA	Pre	28.15	36.58	129.93	0.00	80.36	**3.08***
	Post	28.51	69.38	63.94	-23.32		

*Note: *1% level of significance, ** 5% level of significance, *** 10% level of significance*

In the case of Union Bank Non-Interest Income and Dividend Payout has declined significantly during post recession period. From the analysis it is found that the global financial crisis does not have significant impact on the financial performance of the Union Bank.

TABLE 5: TRENDS IN PROFITABILITY RATIO OF VIJAYA BANK DURING PRE AND POST RECESSION PERIOD

Ratios	Period	Mean (%)	SD	CV (%)	Growth (%)	MD	t- Value
II/TF	Pre	7.43	0.79	10.70	-4.63	0.15	**0.49** ^{ns}
	Post	7.58	0.43	5.64	1.71		
IE/TF	Pre	4.74	0.68	14.33	-6.17	0.40	**2.33****
	Post	5.14	0.41	7.98	1.84		
NII/TF	Pre	2.42	0.56	23.11	-8.32	-0.88	**3.77***
	Post	1.54	0.21	13.72	-1.44		
OE/TF	Pre	29.34	5.25	17.89	-1.89	-4.09	**3.72***
	Post	25.25	4.54	17.97	1.79		
DPO	Pre	24.56	10.85	44.20	-3.29	-9.91	**2.58****
	Post	14.65	3.21	21.88	-6.95		
RONW	Pre	1.00	0.46	45.72	-1.06	-0.41	**2.35****
	Post	0.59	0.10	17.55	-2.84		
ROA	Pre	19.11	20.57	107.64	0.00	-3.07	**0.22** ^{ns}
	Post	16.04	25.99	162.09	0.00		

*Note: *1% level of significance, ** 5% level of significance, *** 10% level of significance*

It is observed from the analysis the Interest Income of Vijaya bank have increased during post recession period but not statistically significant, but the non-interest income of the bank have declined significantly. The return on net worth and dividend payout also declined significantly, however the overall return on assets have decline but not due to recession.

REGRESSION ANALYSIS

REGRESSION MODEL

After taking the broad review of literature, the following model is specified to estimate the impact of recent financial crisis on the performance of selected Indian public sector banks.

To estimate the relationship between Return on Assets and Spread, Burden, Contingency and Dummy variable of financial crises regress following regression model

$$\mathbf{Yt= \beta_o+ \beta_1X_1+ \beta_2X_2+\beta_3X_3+ \beta_4X_4 + \beta_5X_5 + \mu_i}$$

Where,

Y_t = Return On Assets

X_1 = Spread

X_2 = Burden

X_3 = Provision Contingency and

X_4 = Global Recession (Dummy)

μ_i = Error term

Measurement of Variables

Return on Assets (Y) is the dependent variable. The earnings before interest and taxes (EBIT) are divided by Total Assets of the banks. In this study Total Working Funds of the Banks are considered as Total Assets.

Interest Spread (X1) represents the difference of Interest received and interest paid by the bank. Higher the spread more will be the profitability.

Burden (X2) represents the difference of Interest Income and Non-Interest Expenditure. More burdens will reduce the profit of the firm.

Provision and Contingency (X3) these represent a portion of profit kept for contingent situations and expenditure and thus have a direct bearing on the profitability.

Global Recession (Dummy) (X4) to achieve the objectives of this study, Global Recession DUMMY are included in the regression model. Global Recession is dummy variable for the event of global financial crisis. A dummy variable for a period after financial crisis (1) and others (0).

TABLE 6: REGRESSION RESULTS ($Y_t= \beta_o+ \beta_1X_1+ \beta_2X_2+\beta_3X_3+ \beta_4X_4 + \beta_5X_5 + \mu_i$)

Name of the Bank	Constant	Spread	Burden	Contingency	Recession (Dummy)	R	R^2	Adj.R^2	F value
BOB	-107.262	0.507*	-9.904	-0.438*	154.381	0.994	0.987	0.980	136.887*
	(0.381)	(5.591)	(1.317)	(3.274)	(0.492)				
BOI	-470.177	0.227	-0.040	-0.217	1041.08	0.946	0.895	0.834	14.865*
	(0.874)	(1.006)	(0.313)	(0.919)	(1.531)				
CB	-177.492	0.360***	-0.108	-0.220	295.773	0.987	0.974	0.959	65.712*
	(1.170)	(2.071)	(1.003)	(1.086)	(2.358)				
UBI	-15.818	0.456*	-0.133***	-0.363**	235.676	0.987	0.973	0.958	63.855*
	(0.083)	(3.954)	(2.171)	(2.170)	(0.984)				
VB	-88.804	0.229	-0.032	0.022	44.925	0.853	0.728	0.573	4.684*
	(0.628)	(1.187)	(0.272)	(0.068)	(0.454)				

Note: ** 1% level of significance, ** 5% level of significance, *** 10% level of Significance*

Figures in parenthesis indicant't' value

EMPIRICAL RESULTS

The multiple regression model with ROA as dependent variable has coefficient of determination BOB (98 %), BOI (83.4%), CBL (95.9%), UBI (95.8%) and VBL (57.3%). The regression was found to be significant as depicted from their respective F value. This indicates that all the independent variables viz., Spread, Burden, Provision and Contingency and Global Recession (Dummy) together have a significant influence on the profitability measure, the ROA.

SPREAD

A perusal of the regression results brings out the fact that, its co-efficient has the appropriate positive sing in all the five sample banks. However, its co-efficient is statistically significant in BOB, CB and UBI and improves marginally their respective explanatory power. But in the case of Bank of India and Vijaya Bank the interest spread does not have significant impact on the profitability.

BURDEN

From the regression results it is evident that the co-efficient of Burden has negatively associated with profitability in all the sample banks, however the relationship between profitability and burden is statistically significant only in the case of UBI. Hence, it can be concluded that Burden ratio were found to be important determinants of profitability only in the case of Union Bank of India.

CONTINGENCY

The co-efficient of Contingency has the appropriate negative sign in all the sample firms but the contingency expenditure has significant impact on the profitability in the case of BOB and UBI.

GLOBAL RECESSION

It is interesting to note that the global recession has negative sign in all the banks, the co-efficient of global recession are not statistically significant in any of the banks. It implies that the financial crisis does not have significant impact on the financial performance of selected public sector banks.

CONCLUSIONS AND RECOMMENDATIONS

Indian Banking industry remains resilient from the affects of the global recession. There is a trust among the people in the country about the strength of the banking system. There are no pitfalls in the reforms that took place in 1991 to improve the banking sector. The banks should retain their conservative approach towards business because its conservatism has made the Indian Banks a reliable bet for its customers. The Banks had best used the technology and have used the manpower in an effective manner. The results of the study shows that the banks are sufficiently equipped to absorb losses occurred due to global recession. The Indian banks have high liquidity which shows that the banks have effective cash management system. The Indian Banks are professionally managed and have made them to grow faster and stronger. The results have shown that the banks have high productivity efficient management performance and high liquidity talented employees. So to maintain the growth of India banking industry, the paper recommends that banks should start exploiting the new technologies to enable their employee to have more clientage in order to increase the business and profitability.

To remain competitive in this kind of environment, banks should try to retain the talented workforce with contributes most to the profitability goals of the banks. The management should further try to control the over the expenses and disbursement cost in order to increase the profits. The banks should focus on the risk management while expanding its business internationally. The banks should offer the products to the customers according to their taste. The banks should create a friendly customer environment to satisfy their customers and to retain them. Banks should have an ability to repeat and sustain such efforts in future, which would be critical in maintaining their profitability.

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ELLIPTIC CURVE CRYPTOGRAPHY

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ABSTRACT

We present the first known implementation of elliptic curve cryptography over F2p for sensor networks based on the 8-bit, 7.3828-MHz MICA2 mote. Through instrumentation of UC Berkeley's TinySec module, we argue that, although secret-key cryptography has been tractable in this domain for some time,there has remained a need for an efficient, secure mechanism for distribution of secret keys among nodes. Although public-key infrastructure has been thought impractical, we argue, through analysis of our own implementation for TinyOS of multiplication of points on elliptic curves, that public-key infrastructure is, in fact, viable for TinySec keys' distribution, even on the MICA2. We demonstrate that public keys can be generated within 34 seconds,and that shared secrets can be distributed among nodes in a sensor network within the same, using just over 1 kilobyte of SRAM and 34 kilobytes of ROM.

KEYWORDS
Cryptography, sensor networks.

INTRODUCTION

Wireless sensor networks have been proposed for such applications as habitat monitoring [1], structural health monitoring [2], emergency medical care [3], and vehicular tracking [4],all of which demand some combination of authentication,integrity, privacy, and security. Unfortunately, the state of the art has offered weak, if any, guarantees of these needs.The limited resources boasted by today's sensor networks appear to render them ill-suited for the most straightforward implementations of security protocols. Consider the MICA2 mote [5], designed by researchers at the University of California at Berkeley and fabricated by Crossbow Technology,Inc. This device offers an 8-bit, 7.3828-MHz ATmega 128L processor, 4 kilobytes (KB) of primary memory (SRAM), and 128 KB of program space (ROM). Such a device, given these resources, is seemingly unfit for computationally expensive or energy-intensive operations. For this reason has publickey cryptography often been ruled out for sensor networks as an infrastructure for authentication, integrity, privacy, and security [6]–[9], even despite its allowance for secure rekeying of mobile devices.

But such conclusions have been backed too infrequently by actual data. In fact, to our knowledge, little empirical research has been published on the viability of public-key infrastructure (PKI) for the MICA2, save for a cursory analysis of an implementation of RSA [10] and a recent comparison of RSA and elliptic curve cryptography (ECC) over F*p* [11].Our work aspires to fill this void. Through instrumentation of TinyOS, we first demonstrate that secret-key cryptography is tractable on the MICA2. By way of our own implementation of multiplication of points on elliptic curves, we then argue that PKI for secret keys' distribution is, in fact, tractable as well. Public keys can be generated within 34 seconds (sec),and shared secrets can be distributed within the same, using just over 1 KB of SRAM and 34 KB of ROM.We begin these arguments in Section II with an analysis of TinySec [6], TinyOS's existing secret-key infrastructure for the MICA2 based on SKIPJACK [12]. In Section III, we address shortcomings in that infrastructure with a look at an implementation of Diffie-Hellman for the MICA2 based on the Discrete Logarithm Problem (DLP) and expose weaknesses in its design for sensor networks.

BACKGROUND

Over the past 30 years, public key cryptography has become a mainstay for secure communications over the Internet and throughout many other forms of communications. It provides the foundation for both key management and digital signatures. In key management, public key cryptography is used to distribute the secret keys used in other cryptographic algorithms (e.g. DES). For digital signatures, public key cryptography is used to authenticate the origin of data and protect the integrity of that data. For the past 20 years, Internet communications have been secured by the first generation of public key cryptographic algorithms developed in the mid-1970's. Notably, they form the basis for key management and authentication for IP encryption (IKE/IPSEC), web traffic (SSL/TLS) and secure electronic mail.

This paper will outline a case for moving to elliptic curves as a foundation for future Internet security. This case will be based on both the relative security offered by elliptic curves and first generation public key systems and the relative performance of these algorithms. The two noteworthy first generation public key algorithms used to secure the Internet today are known as RSA and Diffie-Hellman (DH). The security of the first is based on the difficulty of factoring the product of two large primes. The second is related to a problem known as the discrete logarithm problem for finite groups. Both are based on the use of elementary number theory. Interestingly, the security of the two schemes, though formulated differently, is closely related.

SKIPJACK AND THE MICA2

TinyOS currently offers the MICA2 access control, authentication,integrity, and confidentiality through TinySec, a linklayer security mechanism based on SKIPJACK in cipher-block chaining mode. An 80-bit symmetric cipher, SKIPJACK is the formerly classified algorithm behind the Clipper chip, approved by the National Institute for Standards and Technology (NIST) in 1994 for the Escrowed Encryption Standard [13]. TinySec supports message authentication and integrity with message authentication codes, confidentiality with encryption, and access control with shared, group keys.The mechanism allows for an 80-bit key space, the benefit of which is that known attacks require as many 279 operations on average (assuming SKIPJACK isn't reduced from 32 rounds [14]).1 Moreover, as packets under TinySec include a 4-byte message authentication code (MAC), the probability of blind forgery is only 2−32. This security comes at a cost of just five bytes (B): whereas transmission of some 29-byte plaintext and its cyclic redundancy check (CRC) requires a packet of 36 B, transmission of that plaintext's ciphertext and MAC under TinySec requires a packet of only 41 B, as the mechanism borrows TinyOS's fields for Group ID (TinyOS's weak, default mechanism for access control) and CRC for its MAC.

Performance. The impact of TinySec on the MICA2's performance is reasonable. On first glance, it would appear that TinySec adds under 2 milliseconds (ms) to a packet's transmission time (Table I) and under 5 ms to a packet's roundtrip time to and from some neighbor (Table II). However,the apparent overhead of TinySec, 1,244 microseconds (*μ*sec)on average, as suggested by transmission times, is nearly subsumed by the data's root mean square (1,094 *μ*sec). Roundtrip

times exhibit less variance, but tighter benchmarks are in order for TinySec's accurate analysis. Table III, then, offers results with yet less variance from finer instrumentation of TinySec: encryption of a 29-byte, random payload requires 2,190 µsec on average, and computation of that payload's MAC requires 3,049 µsec on average; overall,TinySec adds 5,239 } 18 µsec to a packet's computational requirements. It appears, then, that some of those cycles can be subsumed by delays in scheduling and medium access, at least for applications not already operating at full duty.The results of an analysis of the MICA2's throughput, without and with TinySec enabled, puts the mechanism's computational overhead for such applications into perspective: on average, TinySec may lower throughput of acknowledged packets by only 0.28 packets per second. These results appear in line with UC Berkeley's own evaluation of TinySec [15].

Memory. Of course, TinySec's encryption and authentication does come at an additional cost in memory. Per Table IV,TinySec adds 454 B to an application's .bss segment, 276 B to an application's .data segment, 7,076 B to an application's .text segment, and 92 B to an application's maximal stack size during execution. For applications that don't require the entirety of the MICA2's 128 KB of program memory and 4 KB of primary memory, then, TinySec is a viable addition.

Security. As with any cipher based only on shared secrets,TinySec is, of course, vulnerable to various attacks. After all,the MICA2 is intended for deployment in sensor networks. For reasons of cost and logistics, long-term, physical security of the devices is unlikely. Compromise of the network, therefore,reduces to compromise of any one node, unless, for instance,rekeying is possible. Pairwise keys among *n* nodes would cer-tainly provide some defense against compromises of individual nodes. But *n*2 80-bit keys would more than exhaust a node's SRAM for *n* as small as 20. A more sparing use of secret keys is in order, but secure, dynamic establishment of those keys, particularly for networks in which the positions of sensors may be transient, requires a chain or infrastructure of trust. In fact, the very design of TinySec requires as much for rekeying as well. Though TinySec's 4-byte initialization vector (IV) allows for secure transmission of some message as many as 232 times, that bound may be insufficient for embedded networks whose lifespans demand longer lasting security.2 Needless to say, TinySec's reliance on a single secret key prohibits the mechanism from securely rekeying itself.Fortunately, these problems of secret keys' distribution are redressed by public-key infrastructure. The sections that follow thus explore options for that infrastructure's design and implementation on the MICA2.

TABLE I: TRANSMISSION TIMES REQUIRED TO TRANSMIT A 29-BYTE, RANDOM PAYLOAD, AVERAGED OVER 1,000 TRIALS, WITH AND WITHOUT TINYSEC ENABLED. TRANSMISSION TIME IS DEFINED HERE AS THE TIME ELAPSED BETWEEN ENDMSG.SEND(·, ·, ·) AND SENDMSG.SENDDONE(). THE IMPLIED OVERHEAD OF TINYSEC ON TRANSMISSION TIME IS GIVEN AS THE DIFFERENCE OF THE DATA'S MEANS. THE ROOT MEAN SQUARE IS DEFINED AS

TABLE-1

	without TinySec	with TinySec
Median	72,904 µsec	74,367 µsec
Mean	74,844 µsec	76,088 µsec
Standard Deviation	24,248 µsec	24,645 µsec
Standard Error	767 µsec	779 µsec

Implied Overhead of TinySec	1,244 µsec
Root Mean Square	1,094 µsec

TABLE II: ROUND-TRIP TIMES REQUIRED TO TRANSMIT A 29-BYTE, RANDOM PAYLOAD, WITH AND WITHOUT TINYSEC ENABLED, FROM ONE NODE TO A NEIGHBOR AND BACK AGAIN, AVERAGED OVER 1,000 TRIALS. MORE PRECISELY, ROUND-TRIP TIME IS DEFINED HERE AS THE TIME ELAPSED BETWEEN SENDMSG.SEND(·, ·, ·) AND RECEIVEMSG.RECEIVE(·). THE IMPLIED OVERHEAD OF TINYSEC ON ROUND-TRIP TIME IS GIVEN AS THE DIFFERENCE OF THE DATA'S MEANS.

TABLE-2

	without TinySec	with TinySec
Median	145,059 µsec	149,290 µsec
Mean	147,044 µsec	152,015 µsec
Standard Deviation	30,736 µsec	31,466 µsec
Standard Error	972 µsec	995 µsec

Implied Overhead of TinySec	5,239 µsec
Root Mean Square	9 µsec

TABLE III: TIMES REQUIRED TO TO ENCRYPT A 29-BYTE, RANDOM PAYLOAD, AND TO COMPUTE THAT PAYLOAD'S MAC, AVERAGED OVER 1,000 TRIALS. THE IMPLIED OVERHEAD OF TINYSEC IS GIVEN DIFFERENCE OF THE _ DATA'S MEANS.

TABLE-3

Implied Overhead of TinySec	4,971 µsec
Root Mean Square	1,391 µsec

	encrypt()	computeMAC()
Median	2,189 µsec	3,038 µsec
Mean	2,190 µsec	3,049 µsec
Standard Deviation	3 µsec	281 µsec
Standard Error	0 µsec	9 µsec

TABLE IV: MEMORY OVERHEAD OF TINYSEC, DETERMINED THROUGH INSTRUMENTATION OF CNTTORFM, AN APPLICATION WHICH SIMPLY BROADCASTS A COUNTER'S VALUES OVER THE MICA2'S RADIO. THE .BSS AND .DATA SEGMENTS CONSUME SRAM WHILE THE .TEXT SEGMENT CONSUMES ROM. STACK IS DEFINED HERE AS THE MAXIMUM OF THE APPLICATION'S STACK SIZE DURING EXECUTION.

TABLE-4

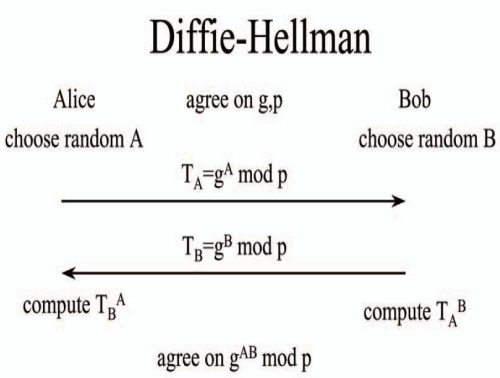
	without TinySec	with TinySec	Difference
.bss	384 B	838	454 B
.data	4 B	280 B	276 B
.text	9,220 B	16,296 B	7,076 B
stack	105 B	197 B	92

DLP AND THE MICA2

With the utility of SKIPJACK-based TinySec thus motivated and the mechanism's costs exposed, we next examine DLP, on which Diffie-Hellman [16] is based, as an answer to the MICA2's problems of secret keys' distribution. DLP typically involves recovery of $x \in Zp$, given p, g, and gx (mod p),where p is a prime integer, and g is a generator of Zp. By leveraging the presumed difficultly of DLP, Diffie-Hellman allows two parties to agree, without prior arrangement, upon a shared secret, even in the midst of eavesdroppers, with perfectforward secrecy, as depicted in Fig. 2. Authenticated exchanges are possible with the station-to-station protocol (STS) [17], a variant of Diffie-Hellman.With a form of Diffie-Hellman, then, could two nodes thus establish a shared secret for use as TinySec's key. At issue, though, is the cost of such establishment on the MICA2. Inasmuch as the goal at hand is distribution of 80-bit TinySec keys, any mechanism of exchange should provide at least as much security. According to NIST [18], then, the MICA2's implementation of Diffie-Hellman should employ a modulus, p, of at least 1,024 bits and an exponent (*i.e.*, private key), x, of at least 160 bits (Table V).Unfortunately, on an 8-bit architecture, computations with 160-bit and 1,024-bit

values are not inexpensive. However, modular exponentiation is not intractable on the MICA2. Table VI details the operations' memory usage.Of course, these measurements assume operation at full duty cycle, the energy requirements of which may be unacceptable,as the MICA2's lifetime decreases to just a few days at maximal duty cycle. Table VII reveals the MICA2's energy consumption for modular exponentiation: computation of 2*x* (mod *p*) appears to require 1.185 J. Roughly speaking, a mote could devote its lifetime to 51,945 such computations.3 Of course, these numbers might be improved (with, *e.g.*,hand-optimization). Unfortunately, these computations require not only time but also memory. Mere storage of a public key requires as many bits as is the modulus in use. Accordingly, *n* 1,024-bit keys would more than exhaust a node's SRAM for *n* as small as 32. Although a node is unlikely to have—or, at least, need—so many neighbors or certificate authorities for whom it needs public keys, Diffie-Hellman's relatively large key sizes are unfortunate in the MICA2's resource-constrained environment. A key of this size would not even fit in a single TinyOS packet.

FIG. 1



Typical exchange of a shared secret under Diffie-Hellman based on DLP [21].

TABLE V: STRENGTH OF DIFFIE-HELLMAN BASED ON DLP FOR VARIOUS MODULI AND EXPONENTS. "AN ALGORITHM THAT HAS A '*Y* ' BIT KEY, BUT WHOSE STRENGTH IS EQUIVALENT TO AN '*X*' BIT KEY OF SUCH A SYMMETRIC ALGORITHM IS SAID TO PROVIDE '*X* BITS OF SECURITY' OR TO PROVIDE '*X*-BITS OF STRENGTH'. AN ALGORITHM THAT PROVIDES *X* BITS OF STRENGTH WOULD, ON AVERAGE, TAKE 2*X*–1*T* TO ATTACK, WHERE *T* IS THE AMOUNT OF TIME THAT IS REQUIRED TO PERFORM ONE ENCRYPTION OF A PLAINTEXT VALUE AND COMPARISON OF THE RESULT AGAINST THE CORRESPONDING CIPHERTEXT VALUE." [18]

TABLE-5

Bits of Security	Modulus	Exponent
80	1,024	160
112	2,048	224
128	3,072	256
192	7,680	384
256	15,360	512

TABLE VI: MEMORY OVERHEAD OF MODULAR EXPONENTIATION, DETERMINED THROUGH INSTRUMENTATION OF AN IMPLEMENTATION OF DIFFIE-HELLMAN BASED ON DLP ON THE MICA2 WHICH COMPUTES 2*x* (MOD *p*), WHERE *x* IS A 512-BIT INTEGER AND *p* IS PRIME. THE .BSS AND .DATA SEGMENTS CONSUME SRAM WHILE THE .TEXT SEGMENT CONSUMES ROM. STACK IS DEFINED HERE AS THE MAXIMUM OF THE APPLICATION'S STACK SIZE DURING EXECUTION.

TABLE-6

	768-Bit Modulus	1,024-Bit Modulus
.bss	852 B	980 B
.data	102 B	134 B
.text	11,334 B	11,350 B
stack	136 B	136 B

TABLE VII: ENERGY CONSUMPTION OF MODULAR EXPONENTIATION, DETERMINED THROUGH INSTRUMENTATION OF AN IMPLEMENTATION OF DIFFIE-HELLMAN BASED ON DLP ON THE MICA2 WHICH COMPUTES 2*x* (MOD *p*), WHERE *x* IS A 160-BIT INTEGER AND *p* IS A 1,024-BIT PRIME.

TABLE-7

	1,024-Bit Modulus, 160-Bit Exponent
Total Time	54.1144 sec
Total CPU Utilization	3.9897 × 108 cycles
Total Energy	1.185 Joules

ELLIPTIC CURVE SECURITY AND EFFICIENCY

The majority of public key systems in use today use 1024-bit parameters for RSA and Diffie-Hellman. The US National Institute for Standards and Technology has recommended that these 1024-bit systems are sufficient for use until 2010. After that, NIST recommends that they be upgraded to something providing more security. The question is what should these systems be changed to? One option is to simply increase the public key parameter size to a level appropriate for another decade of use. Another option is to take advantage of the past 30 years of public key research and analysis and move from first generation public key algorithms and on to elliptic curves.

One way judgments are made about the correct key size for a public key system is to look at the strength of the conventional (symmetric) encryption algorithms that the public key algorithm will be used to key or authenticate. Examples of these conventional algorithms are the Data Encryption Standard (DES) created in 1975 and the Advanced Encryption Standard (AES) now a new standard. The length of a key, in bits, for a conventional encryption algorithm is a common measure of security. To attack an algorithm with a k-bit key it will generally require roughly 2k-1 operations. Hence, to secure a public key system one would generally want to use parameters that require at least 2k-1 operations to attack. The following table gives the key sizes recommended by the National Institute of Standards and Technology to protect keys used in conventional encryption algorithms like the (DES) and (AES) together with the key sizes for RSA, Diffie-Hellman and elliptic curves that are needed to provide equivalent security.

TABLE – 8: NIST RECOMMENDED KEY SIZES

Symmetric Key Size (bits)	RSA and Diffie-Hellman Key Size (bits)	Elliptic Curve Key Size (bits)
80	1024	160
112	2048	224
128	3072	256
192	7680	384
256	15360	521

To use RSA or Diffie-Hellman to protect 128-bit AES keys one should use 3072-bit parameters: three times the size in use throughout the Internet today. The equivalent key size for elliptic curves is only 256 bits. One can see that as symmetric key sizes increase the required key sizes for RSA and Diffie-Hellman increase at a much faster rate than the required key sizes for elliptic curve cryptosystems. Hence, elliptic curve systems offer more security per bit increase in key size than either RSA or Diffie-Hellman public key systems.

Security is not the only attractive feature of elliptic curve cryptography. Elliptic curve cryptosystems also are more computationally efficient than the first generation public key systems, RSA and Diffie-Hellman. Although elliptic curve arithmetic is slightly more complex per bit than either RSA or DH arithmetic, the added strength per bit more than makes up for any extra compute time. The following table shows the ratio of DH computation versus EC computation for each of the key sizes listed in Table 8.

TABLE 9: RELATIVE COMPUTATION COSTS OF DIFFIE-HELLMAN AND ELLIPTIC CURVES[1]

Security Level (bits)	Ratio of DH Cost : EC Cost
80	3:1
112	6:1
128	10:1
192	32:1
256	64:1

Closely related to the key size of different public key systems is the channel overhead required to perform key exchanges and digital signatures on a communications link. The key sizes for public key in Table 8 (above) is also roughly the number of bits that need to be transmitted each way over a communications channel for a key exchange[2]. In channel-constrained environments, elliptic curves offer a much better solution than first generation public key systems like Diffie-Hellman.

In choosing an elliptic curve as the foundation of a public key system there are a variety of different choices. The National Institute of Standards and Technology (NIST) has standardized on a list of 15 elliptic curves of varying sizes. Ten of these curves are for what are known as binary fields and 5 are for prime fields. Those curves listed provide cryptography equivalent to symmetric encryption algorithms (e.g. AES, DES or SKIPJACK) with keys of length 80, 112, 128, 192, and 256 bits and beyond as shown in table-9.

For protecting both classified and unclassified National Security information, the National Security Agency has decided to move to elliptic curve based public key cryptography. Where appropriate, NSA plans to use the elliptic curves over finite fields with large prime moduli (256, 384, and 521 bits) published by NIST.

The United States, the UK, Canada and certain other NATO nations have all adopted some form of elliptic curve cryptography for future systems to protect classified information throughout and between their governments. The Cryptographic Modernization Initiative in the US Department of Defense aims at replacing almost 1.3 million existing equipments over the next 10 years. In addition, the Department's Global Information Grid will require a vast expansion of the number of security devices in use throughout the US Military. This will necessitate change and rollover of equipment with all major US allies. Most of these needs will be satisfied with a new generation of cryptographic equipment that uses elliptic curve cryptography for key management and digital signatures.

CONCLUSION

Elliptic Curve Cryptography provides greater security and more efficient performance than the first generation public key techniques (RSA and Diffie-Hellman) now in use. As vendors look to upgrade their systems they should seriously consider the elliptic curve alternative for the computational and bandwidth advantages they offer at comparable security. Despite claims to the contrary, public-key infrastructure appears viable on the MICA2, certainly for infrequent distribution of shared secrets. Although our implementation of ECC in 4 KB of primary memory on this 8-bit, 7.3828-MHz device offers room for further optimization, even a minute's worth of computation every 232 transmissions (or every day or every week) seems reasonable for re-keying.The need for PKI's success on the MICA2 seems clear.TinySec's shared secrets do allow for efficient, secure communications among nodes. But such devices as those in sensor networks, for which physical security is unlikely, require some mechanism for secret keys' distribution.In that it offers equivalent security at lower cost to memory and bandwidth than does Diffie-Hellman based on DLP, a public-key infrastructure for key distribution based on elliptic curves is an apt, and viable, choice for TinyOS on the MICA2.

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IMPACT OF STRESS ON ACADEMIC PERFORMANCE AMONG POST GRADUATE STUDENTS

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ABSTRACT

Stress is a word that is regularly used today but has become progressively more difficult to describe. Stress usually describes a negative idea that can have an effect on one's mental and physical well-being. Stress can have an effect on student's academic performance. Different types of stressors such as time management, financial problems, health problems, personal problems, assignments, etc create pressure to the academic performance of the students. This research paper investigates the different sources of stress and finds their impact on the academic performance. It also describes the different ways that can be adopted to reduce the impact of stress, which in turn would help the students to achieve good academic performance.

KEYWORDS
Interpersonal stress, intrapersonal stress, academic stressors, academic performance.

INTRODUCTION

The term Stress was coined by Hans Selye in 1936, who defined it as "the non- specific response of the body to any demand for change" (stress, 2013)Stress is becoming part of human life and every individual faces stress in their life. Stress has a negative impact on one's mental and physical well-being. Throughout a lifetime, one may experience thousands of different episodes of stress. The level of stress may vary from intense to minimal (Maheswari & Deepa, 2013). In order to achieve academic success college students have to face many obstacles. There are many stressors such as time management, financial problems, sleep deprivation, health problems etc which pose as a threat to students academic performance.

There are several emotional and physical disorders that are caused due to stress such as depression, anxiety, heart attacks, stroke, hypertension, etc. Stress can also have direct effects on the skin like rashes and acne. In fact, it's hard to think of any part of the body that is not affected by stress (stress, 2013).

According to Dr Karl Albrecht who is a pioneer in the development of stress reduction training for business people has defined four types of stress: Time Stress, Anticipatory Stress, Situational Stress and Encounter Stress.

Time Stress: Time Stress occurs when people worry about time. People worry about a number of things that have to be done and have a fear if they will be able to achieve or not due to lack of time (mindtools, 2013).

Anticipatory Stress: This stress occurs when we worry about the future. It can be related to a specific event for example when we are going to give a presentation (mindtools, 2013).

Situational Stress: People face situational stress when they are in a scary situation that have no control over. This could be an emergency. For example making a major mistake in front of team are examples of events that can lead to situational stress (mindtools, 2013).

Encounter Stress: Encounter stress occurs when you worry about interacting with a certain person or group of people (mindtools, 2013).

SOURCES OF STRESS

Interpersonal Stressors

Stressors which bothers a person externally and the issues that can bring stress include lack of support within the relationship, lack of healthy communication within the relationship, struggle for power and control in the relationship, poor intimacy within the relationship, over-dependency of one party on another etc (Maheswari & Deepa, 2013).

Intrapersonal Stressors

The personal stressors or routine stressors or unique stressors. Eg change in sleeping habits, eating habits, financial problems etc (Maheswari & Deepa, 2013).

Academic Stressors

Researchers have long been researched on academic stress among students and have identified stressors such as too many assignments, competitions with other students, failures and poor relationships with other students or lectures has an impact on academics (Maheswari & Deepa, 2013)

STRESS MANAGEMENT

"A set of techniques and programs intended to help people deal more effectively with stress in their lives by analyzing the specific stressors and taking positive actions to minimize their effects" (medical-dictionar, 2013).

Some of the techniques to manage stress include: Exercise, Getting a hobby, Meditation, Yoga,Prayer,Listening to certain types of relaxing music, Spending time in nature (wikipedia, 2013)

LITERATURE REVIEW

Talib and Zia – ur- Rehman conducted a study among university graduate and undergraduate students at Rawalpindi and Islamabad to find relationship between perceived stress and academic performance. From the study it was found that perceived stress had significant negative correlation with academic performance

of students. However, there was no difference in stress level among male and female students but it was found that engineering students differed from management sciences in term of perceived stress score. The major sources of stress affecting academic performance were course load, sleep problem and social activities (Jalib & Zia-ur-Rehman, 2012).

IMPACT OF STRESS FACTORS ON COLLEGE STUDENTS ACADEMIC PERFORMANCE

Laura P.Womble did a study on the above topic. Twenty Five college students were chosen for the study. In this study the students were asked to complete a survey including the perceived stress scale and also to rank the different stress factors. The study was unable to find a correlation between the perceived stress score and GPA. The factors that affected student's GPA were sleep and social activities (Womble, 2001).

AN ASSESSMENT OF ACADEMIC STRESS AMONG UNDERGRADUATE STUDENTS

The research was done by Joseph E.Agolla and Henry Ongori. 320 undergraduate students at a university in Botswana participated by completing a self-administered questionnaire. The study reflected that most of the students were experiencing stress in their daily academic activities and the people at home and campus were making them feel anxious. The factors that lead to stress were academic workload, overcrowded lecture halls and uncertainty of getting job after graduating (Agolla & Ongori, 2009).

IMPACT OF STRESS UPON THE ACADEMIC PERFORMANCE OF B-SCHOOL STUDENTS

K.Uma Mahaswari and M. Deepa did a study on the topic. From the study it was found that students of business school experienced medium level of interpersonal ,intrapersonal and academic stressors. From the result, it was identified that increase in interpersonal and intrapersonal stressors affected the academic performance while academic stress brought positive result in the performance (Maheswari & Deepa, 2013).

RELATIONSHIP BETWEEN STRESS AND ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS

Rajni Kumari and Radhakanta Gartia did a research to find the relation between stress and academic achievement of senior school students. A group of 120 students from six senior secondary school of North Western Delhi were randomly selected. The result of the study showed that there existed a difference in academic achievement of students having high, moderate and less stress. Students with high and moderate stress performed better than the students with less stress (Kumari & Gartia, 2012).

LEARNED RESOURCEFULNESS MODERATES THE RELATIONSHIP BETWEEN ACADEMIC STRESS AND ACADEMIC PERFORMANCE

A research among 141 first year undergraduate students was done by Serap Akyun and Joseph Ciarrochi. The study revealed that academic stress was negatively associated with academic performance. Students with low resourceful had academic stress while it had no effect on high resourceful students (Akgun & Ciarrochi, 2003).

IMPACT OF ACADEMIC STRESS ON MBA STUDENTS OF GUJARAT TECHNOLOGICAL UNIVERSITY

The research was done by Anushree Karani. The purpose of the study was to find the components of academic stress among management students of Gujarat Technological University. This study also tried to explain each component of academic stress like curriculum and instruction, team work related issues, assessment, and placement, impact on performance and outcomes of Academic stress. Around 118 students of GTU associated colleges from all the five zones of Gujarat participated. Data was collected through structured academic stress questionnaire and the result revealed that there are academic and psychological stressors which affected the performance of students. Academic Stressors like lack of time for recreational activities and pedagogy of teaching were having impact while cultural effect was having more impact among behavioral sciences (Pandya, Deshpande, & Karani, 2012).

A STUDY OF STRESS SOURCES AMONG COLLEGE STUDENTS IN TAIWAN

Chang Kai – Wen did the research to find the various sources of stress among college students in Taiwan. The data was collected through questionnaire and it was analyzed. The findings suggested that male students faced more stress from family than the females. It was also found that higher class and students who took loan were facing stress from physical/mental, school and emotional factors (kai-Wen, 2010).

AN ASSESSMENT OF STRESS AMONG M.B.A STUDENTS : A STUDY OF SELECTED COLLEGES OF G.B.T.U. IN LUCKNOW (INDIA)

This study was done by Priya and Dr. Vikram Bisen. A total of 300 students from different colleges of Lucknow city took part in this study. The data was collected through questionnaire and it was found that the students were stressed and the factors that lead to stress included fear of getting job after MBA, poor academic performance, inadequate resources and room-mate conflicts (Priya & Bisen, 2012) .

A STUDY OF ACADEMIC STRESS AND ITS EFFECT ON VITAL PARAMETERS IN FINAL YEAR MEDICAL STUDENTS AT SAIMS MEDICAL COLLEGE, INDORE, MADHYA PRADESH

The study was done by Balkishan Sharma, Rajshekhar Wavare, Ajit Deshpande, Richa Nigam and Ramkrishna Chandorka to evaluate stress and its effect on vital parameters during academic examination. The study was conducted among final year medical students of Sri Aurobindo Institute of Medical Sciences,Indore. The height, weight, pulse rate and blood pressure was checked before and during the examination. It was found that academic examination were stressful and produced change in vital parameter which affected their performance (Sharma, Wavare, Deshpande, Nigam, & Chandorkar, 2011)

IMPORTANCE OF THE STUDY

Many researchers have found that there is a direct relationship between stress and academic performance. This study would help the students to discover the various stressors affecting their academics. It helps the faculties in determining the stressors affecting their students and to guide the students in reducing the stress level so that they are more shaped and ready to face the challenges confidently. The study also gives an insight to the management to design and implement new programs that would facilitate in reducing the stress on students.

OBJECTIVES OF THE STUDY

1. To investigate the sources of stress among full time post graduate students of various colleges in Muscat
2. To find out the impact of stress on academic performance
3. To suggest practical methods to overcome stress among students

HYPOTHESES

H_0 : There is no significant relation between stress and academic performance

H_1 : There is significant relation between stress and academic performance

RESEARCH METHODOLOGY

RESEARCH DESIGN

Descriptive Research Design was used to identify the impact of stress on academic performance among full time post graduate students in Muscat. This research was conducted by observing and describing the stressors rather than trying to influence them.

DATA COLLECTION METHOD (s)

The data collected for this study was through the primary method. Census Method was used to collect the primary data The questionnaire was given to a total of 200 students out of which totally 155 useable instruments were received giving a response rate of 77.5%.. The questionnaire was divided into two parts. The first part was related to the demographic details and the second part comprised of 33 questions which was divided into 3 headings: Interpersonal, Intrapersonal and academic stress. There were 5 items on Interpersonal stress, 13 on intra personal

TOOLS & TECHNIQUES

Mean, Standard Deviation, Correlation and T-test was used to analyze the data.

LIMITATIONS TO THE STUDY

- The study was confined to colleges in Muscat
- The study was limited to full time post graduate students only
- The questionnaire was limited to Interpersonal, Intrapersonal and Academic stressors

RESULTS & DISCUSSION

The questionnaire was distributed to the 200 post graduate students of Muscat. Only 155 were complete, correct and useable. Out of 155 students, the number of male students were 60 and female students were 95. 51 respondents were from MBA 1st and 104 students were final year students.

DESCRIPTIVE STATISTICS

Descriptive Statistics are used to explain the basic features of the data in a study. The mean and standard deviation of the three types of stressors have been found and summarized.

TABLE 1: MEAN AND STANDARD DEVIATION OF THREE TYPES OF STRESSORS

Stressors	Mean	Std. Deviation
Interpersonal	2.93	0.73
Intrapersonal	3.22	0.61
Academic	3.43	0.52

TABLE 2: CORRELATION ANALYSIS

Stressors	GPA	Significance
Interpersonal	0.09	0.54
Intrapersonal	0.11	0.41
Academic	-0.26	0.06

INTERPERSONAL STRESSORS

H_{0A} : There is no significant relationship between Interpersonal Stressors and GPA

H_1 : There is significant relationship between Interpersonal Stressors and GPA

INTERPRETATION

The significance value is greater than 0.05 (sig = 0.54).So the null hypothesis is accepted. Hence there is no significant relationship between the Interpersonal Stressors and GPA. Since the correlation value is positive (r = 0.09) it shows that there exists positive correlation between Interpersonal Stressors and GPA. This explains that an increase in the level of Interpersonal Stressors will increase the GPA.

INTRAPERSONAL STRESSORS

H_{0B} : There is no significant relationship between Intrapersonal Stressors and GPA

H_1 : There is significant relationship between Intrapersonal Stressors and GPA

INTERPRETATION

The significance value is greater than 0.05 (sig = 0.41).So the null hypothesis is accepted. Hence there is no significant relationship between the Interpersonal Stressors and GPA. Since the correlation value is positive(r = 0.11) it shows that positive correlation exists between Intrapersonal Stressors and GPA. This explains that an increase in the level of Intrapersonal Stressors will increase the GPA.

ACADEMIC STRESSORS

H_{0C} : There is no significant relationship between Academic Stressors and GPA

H_1 : There is significant relationship between Academic Stressors and GPA

INTERPRETATION

The significance value is greater than 0.05 (sig = 0.06).So the null hypothesis is accepted. Hence there is no significant relationship between the Academic Stressors and GPA. Since the correlation value is negative (r = -0.23) it shows that negative correlation exists between Academic Stressors and GPA. This explains that an increase in the level of Academic Stress will decrease the GPA.

TABLE 3: MEAN COMPARISON OF MALE AND FEMALE

Sex	Interpersonal	Intrapersonal	Academic
Male	2.84	2.98	3.33
N	60	60	60
Std.Deviation	0.83	0.59	0.46
Female	2.99	3.36	3.49
N	95	95	95
Std.Deviation	0.67	0.57	0.55

The mean comparison of the three stressors of male and female was done. The results showed that there was only a slight difference in the level of Interpersonal and Academic Stress of male and female, whereas the Intrapersonal Stress was experienced more by females when compared to males.

t T EST

TABLE 4: MEAN COMPARISON OF MBA 1ST AND MBA 2ND YEARS

Year	Interpersonal	Intrapersonal	Academic
MBA1			
Mean	3.13	3.09	3.53
N	51	51	51
Std.Deviation	0.76	0.50	0.39
MBA2			
Mean	2.83	3.27	3.38
N	104	104	104
Std.Deviation	0.71	0.65	0.57

The mean comparison of MBA 1st and 2nd years showed that there is only a slight difference in the Intrapersonal and Academic Stress of MBA 1st and MBA 2nd years but the Interpersonal Stress is more for the first years than the final year students.

TABLE 5: T – TEST MALE AND FEMALE

Stressors	T	Significance
Interpersonal	-0.73	0.47
Intrapersonal	-2.34	0.02
Academic	-1.08	0.29

The t- test results of the male and female students showed that there is significant difference in the Intrapersonal Stress faced by them, whereas there was no significant difference in the Intrapersonal and Academic Stress.

TABLE 6: MBA 1ST AND 2ND YEARS

Stressors		T	Significance
Interpersonal	Equal Variance Assumed	1.44	0.16
Intrapersonal	Equal Variance Assumed	-1.04	0.30
Academic	Equal Variance Assumed	1.04	0.30

There is no significant difference in the Interpersonal, Intrapersonal and Academic Stress of the first and second year students.

FINDINGS

To find the impact of stress on academic performance the statistical tools used were mean, standard deviation, correlation and T-test.

The correlation analysis was done to find the relationship between the three stressors i.e. Interpersonal, Intrapersonal and Academic and the GPA. The result showed that there was no significant relationship between the three stressors and the GPA. The correlation value of the Interpersonal and Intrapersonal stress were positive which demonstrates that increase in the Interpersonal and Intrapersonal Stress would not affect the academic performance, however there was a negative correlation between the academic stressors and the GPA which means that an increase in academic stress would decrease the academic performance.

From the mean comparison result it was found that there was only a slight difference in the Interpersonal and Academic Stress of male and female. However there was significant difference in the Intrapersonal Stress of male and female. The females experienced more of Intrapersonal Stress than the males.

The mean comparison of MBA 1st and 2nd years showed that the first years faced more of Interpersonal and Academic Stress than the final years, whereas the 2nd years experienced more of Intrapersonal Stress.

t-test was done to find the significant difference between the three stressors of male and female as well as the first and second years.

The result showed that there was a significant difference in the Intrapersonal Stress of males and females, whereas it showed no significant difference between the other two.

There was no significant difference between the three stressors of first and final year students.

RECOMMENDATIONS/SUGGESTIONS

SUGGESTIONS

SUGGESTIONS FOR STUDENTS

- Manage time wisely
- Be organized
- Make a good study environment
- Be optimistic
- Use stress management techniques (stress.about, 2013)

SUGGESTIONS FOR PARENTS

- Have good communication with children
- Avoid pressure on children
- Understand the interest and abilities of the child
- Avoid having high expectations in order to prevent them from additional stress (ezinearticles, 2013)

SUGGESTION FOR FACULTIES AND MANAGEMENT

- There should be good relationship between students and faculties
- The college should have a counselor
- Conduct stress management workshops and seminars that would help the students to balance their academic and personal life

CONCLUSIONS

In the modern era stress has become a part of day to day living of every individual.

This research was done to find the Impact of Stress on Academic Performance among the full time post graduate students in Muscat. The data was collected from 155 post graduate students. The questionnaire consisted of 33 items which was divided into 3 headings Interpersonal, Intrapersonal and Academics.

The details were entered in SPSS for interpretation. The result showed a negative correlation between academic stress and GPA which means that an increase in academic stress decreases GPA.

The management of stress is very important. The best way of dealing stress is by learning how to manage the stress that comes in one's life. The management of stress is possible only when one knows the factors that lead to stress.

SCOPES FOR FUTURE RESEARCH

For future research studies, the same questionnaire can be translated into Arabic. The present study was confined to full time Post graduate students, in future the study can be done among the foundation, UG AND EMBA students. The same study can be conducted at all the educational institutions in Oman.

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THE NEXT BIG THING IN COMPUTING IS CLOUD COMPUTING: AN INTRODUCTION, CONCEPT AND ISSUES

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ABSTRACT

Cloud system is a new developing research discipline and it is also a subdivision of Business Intelligence and internet technology. It has attracted a great deal of attention in the Information Technology and in the society as a whole in recent years, due to the availability of a wide range of new systems. The evolutionary changes in technology have made it possible to use cloud computing. Cloud computing is now grabbing a great deal of attention among users and business people all over world. This is a study relating to the introduction of cloud computing and its advantages and issues.

KEYWORDS

cloud systems, cloud computing.

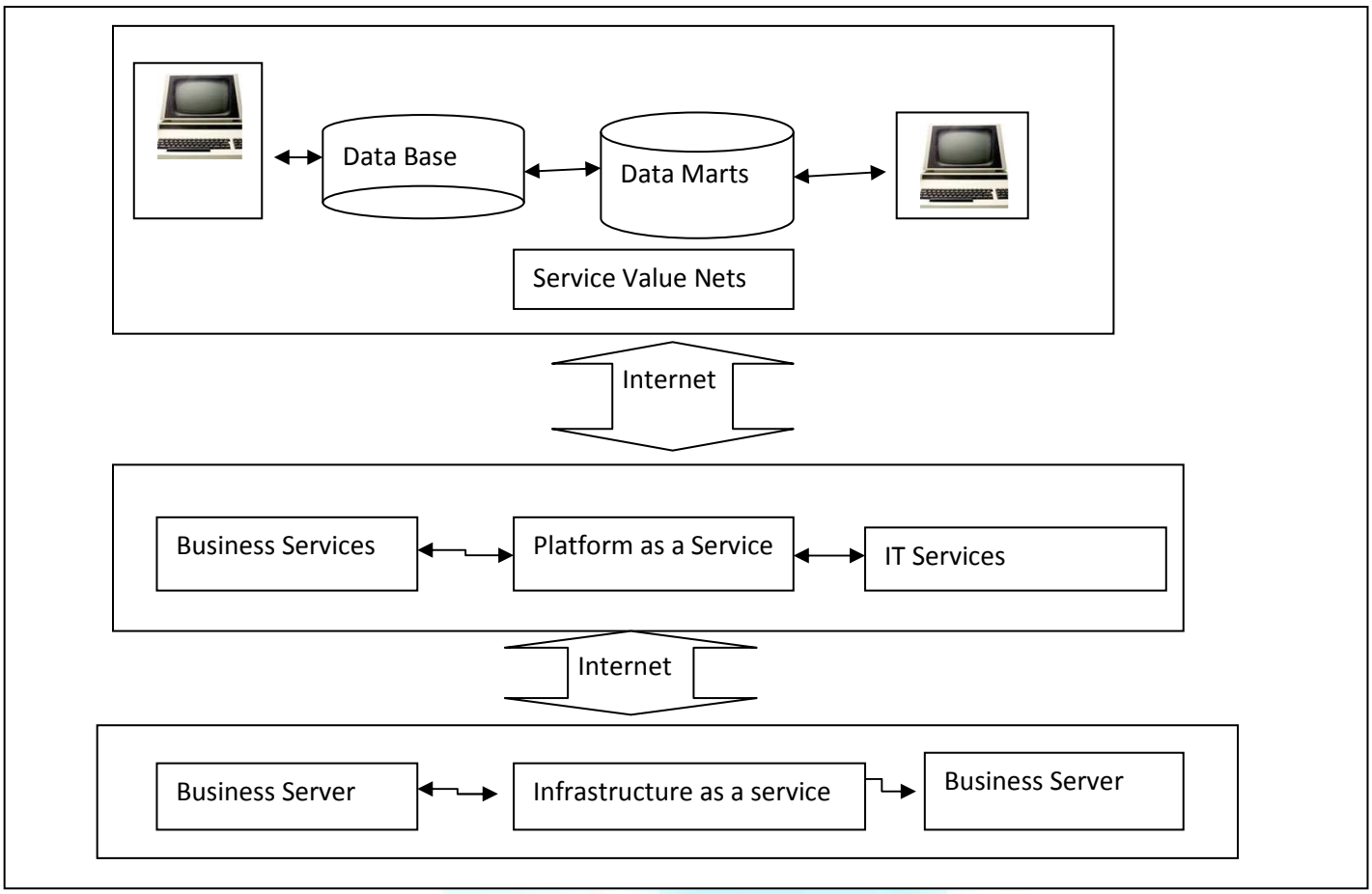
INTRODUCTION

In the traditional system there are a number of software programs that are available to create any file and after creating the file, it is stored where it was created. The documented files are stored on the particular system which may be shared by using a network. The network computing deals with all the information stored inside the server, which is maintained by the company or the organization, however in this case, users outside the network cannot access any information. Therefore there is a need for technology in order to overcome this major issue and it is done through the existence of the internet application. As everyone knows, the term Internet is a global network connecting millions of computers. With the help of globally distributed internet to share the information, the internet technology is improving day by day by developing new applications which is called cloud computing. This paper helps one to pay close attention to the development trend and characteristics of Cloud Computing and its uses.

CLOUD COMPUTING

The data can be accessed via internet and any authorized user can access the system from any computer. The user may be an individual or group or even an enterprise but technology is located in the cloud which is invisible. The cloud computing hardware is maintained by separate multiple third party servers with the help of different data centers. It is a powerful platform that provides services on demand, which are always on, anywhere, anytime and anyplace. It is the best application to share information through the web by using world's apps, devices, and services. A cloud computing system must make a copy of all its clients' information and store it in other devices. These copies enable the central server to access backup machines to retrieve data that otherwise would be unreachable. If users store their documents in one place in the cloud service, they can access the same from anywhere wherein the only constraint would be the availability of the internet connection. The Data store API, we're moving beyond files and providing a new model for effortlessly storing and syncing app data. When you use an app built with data stores your data will be up-to-date across all devices whether you're online or offline. Some of the free cloud service providers provide an option called "shared older option" which primarily deals with creating user groups and only the member of the group can access the data.

FIG. 1.0 CLOUD SYSTEMS



TYPES OF CLOUDS FOR DEPLOYMENT

Clouds types can be classified based on how users subscribe and use it. From the point of view from the users' needs the clouds completely depend upon the nature of their work or business. In recent enterprises, most of the users deal with huge volumes of data and their transactions is also very high. In general, by looking at the need of the user, the cloud can offer four types of services such as
public, private, community and hybrid. Public Cloud can be accessed by any subscriber with an internet connection and the access to the cloud space may be any single user. The group or organization can be organized or grouped together to build the private cloud. Here, accessible permission can be limited only by the group or company. A community cloud is shared by two or more organizations that can used the same cloud services like an intranet. A hybrid cloud is a combination of any of the above said cloud services.

TYPES OF CLOUDS FOR DELIVERY

SOFTWARE AS A SERVICE

It is the process of keeping a copy of critical software-as-a-service application data with an independent third party. In the cloud services, the SaaS provider gives its subscribers access to both resources and applications. SaaS also makes it easier to have the same software on all of your devices at once by accessing it on the cloud. Cloud services fully support SaaS service so that users adhere to the following features: easier administration, automatic update, compatibility, easier collaboration and global accessibility.

PLATFORM AS A SERVICE

Platform as a service is a model which can be commonly shared by users. The consumer creates the software using tools from the provider. The consumer controls the software deployment and configuration settings. The provider provides the networks, servers, storage, and other services. A PaaS system goes a level above the Software as a Service setup. A PaaS provider gives the subscribers access to the components that they require to develop and operate applications over the internet. Cloud also supports a best system to share network, servers and other resources. Thus, a cloud user can get Add-on development facilities, stand alone development environment, and an open platform as a service.

INFRASTRUCTURE AS A SERVICE

Infrastructure as a service is a provision model in which an organization outsources the equipment used to support operations, including storage, hardware, servers and networking components. An IaaS agreement, as the name states, deals primarily with computational infrastructure.

ADVANTAGES OF CLOUD COMPUTING

Cloud computing is an umbrella, a term used to refer to Internet based development and services. There are many advantages in a cloud system. The major advantages are:

LOW COST COMPUTERS FOR USERS OR IT INFRASTRUCTURE COSTS

The purpose of economic feasibility assessment is to determine the positive economic benefits to the organization that the proposed system will provide. It includes quantification and identification of all the benefits expected. This assessment typically involves a cost benefits analysis. The users need not worry about the new updated configured system used to avail cloud.

FEWER MAINTENANCE ISSUES

Software maintenance in software engineering is the modification of a software product after delivery to correct faults, in order to improve its performance or other attributes. From time to time maintenance will be undertaken on online services.

UNLIMITED STORAGE CAPACITY

Many companies are provided with a large storage system. For example Livedrive is one of the world's fastest growing cloud storage companies serving millions of home users, small businesses and enterprises worldwide

UNIVERSAL ACCESS

Cloud system can address the accessibility, usability and acceptability of Information Society Technologies by anyone, anywhere and at anytime, through any media or device.

SHARED POOL OF CONFIGURABLE COMPUTING RESOURCES

There is a sense of location independence wherein the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction. The resources include storage, processing, memory, network bandwidth, and virtual machines which are used in the cloud system.

ON-DEMAND NETWORK ACCESS

There is a broad network accessibility used to improve the performance of cloud system. A lot of new technology devices like mobile phones, laptops, and PDAs are promoting the usability of cloud computing. In addition Cloud computing customers do not own the physical infrastructure. Cloud providers have mirrored solutions to minimize downtime in the event of a disaster. This type of resiliency can give businesses the sustainability they need during unanticipated events.

ISSUES OF CLOUD COMPUTING

TECHNICAL AND INTERNET ISSUES

If a company wants to establish a cloud computing system, it needs to purchase computers with a high configuration and also with the latest features. In this case however, a company smaller in size need not invest a huge amount to establish this system. The user should have internet facilities which includes everything from the way cities are built to making sure there's proper equipment which are related with internet like computers, modems, telephone lines network hardware and service provider. Another factor behind the internet access is the economic facet, as the cost of infrastructure, equipment, and services can determine the level of access available to regions, communities, and individuals. Cloud computing systems deal with addressing these problems.

SECURITY ISSUES

Computer crime is a growing threat to the society and is caused by the criminals. The crime includes the authorized use, access, and destruction of hardware, software, data or network resources, unauthorized release of information, and denial of services**.** In general the internet users can trust their security and reliability. A trusted Internet takes into account security, transaction protection, identity assertion and management. There are also chances for malicious activities that could damage the routing infrastructure as well as data in the future. When we talk about secure cloud computing, we should not only concentrate on identifying a problem but also on who will be responsible for managing the security of data with guarantee. Thus new mechanisms are needed to provide this level of assurance and must support both the end-to-end nature of Internet architecture and also its users. The Internet Society is working closely with the OECD, APEC, ENISA, WEF and other organizations to develop policy solutions that help in achieving this goal. Trusting a third party requires taking risks which will be more risky when we are using free cloud system.

LEGAL ISSUES

Many legal issues are not yet resolved. The current issues need to be reformed in the pipeline. Here the problem of identifying the controller and also identifying which law will be applicable needs to be solved.

PRIVACY ISSUES

Business ethics is concerned with a number of ethical questions that managers must confront as part of their daily business decision making. The internet is open to violations of their privacy. There are no tough rules regarding what information is personal and what information is private. Most of the information is available on the internet with some of the applications still open for all to access. The electronic frontier is unsecure with no tough rules on what information should be private and what should be public. As a result, in the context of privacy issues of cloud system, it is very difficult to promote responsibility among business professionals.

CONCLUSION

This research introduces the theoretical basics of Cloud system. With the information overload, Cloud system is a new and promising research issue to help users in gaining insight into overwhelming information on the cloud. In this paper, we present a preliminary discussion about the cloud system, including the definition, Concepts, and its functions. Research can be done by implementing new techniques which can in turn provide the user with the opportunity to analyze the cloud at different levels of abstraction such as user issues, security issues and storage issues.

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ADOPTION OF CONTEMPORARY COST MANAGEMENT TECHNIQUES FOR BETTER MANAGEMENT OF COSTS

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ABSTRACT

The paper presents the importance and use of modern cost management techniques for better management of costs. This paper describes different ways of working and link between the modern and traditional cost management techniques. The paper as well as explains that the reason of adoption of modern cost management techniques is the failure or the limitations of traditional cost management techniques though different companies are used traditional cost management techniques but due to their limitations now companies are moving to adopt modern cost management techniques. The study also investigates similarities and differences of modern and traditional cost management techniques. It is revealed that various costing techniques and methods are covered under traditional and contemporary cost management techniques but modern cost management techniques are more useful.

KEYWORDS
cost management techniques, management of costs.

INTRODUCTION

The development of today's international markets and the fast spreading use of the internet or computer technology have created a highly competitive and transparent market environment. The present business environment is characterized by global competition, the high rate of automation, environmental and safety issues, short product life-cycle and consumers' need for innovative and high quality products at sound prices. In today's time of fast technological change, strong global and domestic competition, for manufacturing companies especially total cost management is essential to maintain corporate profitability and competitiveness. "In today's environment, nothing is constant or predictable - not market growth, customer demand, product life cycles, the rate of technological change, or the nature of competition" (Hammer & Champy 1993). Today the management mantra for a company is conquer the costs before the costs conquer you and cost refers total cost to the customer. The cost leadership strategy does not suggest compromise in technology, quality or product differentiation. Low costs of product have no advantage, if the customers are not ready to buy the low cost product of company. Hence management of cost must be driven with customer as the focus. The survival triplet in current environment for any company is how to manage the cost of product/service, quality and performance.

COST MANAGEMENT

In recent years the management accounting system has developed in new form to control activities. This new role influences the members of the organization to realize effective cost management to chase every potential cost reduction chance. In literature cost management is defined in different ways. Cost management is used for planning and controlling costs and it has different methods. Monden & Sakurai (1989) stated that some people consider cost management as cost reduction and cost control activities while other as only cost control. Accountancy SA (2009) defined cost management as a "proactive process of identifying causes of costs, with the objectives of managing and minimizing the total costs associated with the production of products and services to customers". Cooper (1996) opined that companies need to refined cost management systems to improve their performance. Horngren et al. (2006) defined cost management as the set of actions that managers take to satisfy customers while continuously reducing and controlling costs. Cooper (1995) defined cost management as the creation of stress to reduce and control costs. Kato (1993) mentioned that in today's ever changing environment cost reduction is good but it should without sacrifice quality, functions and characteristics of the product. Therefore effective cost management requires that managers should enthusiastically look for cost reduction opportunities with the maintenance of product value for the customer's point of view. Furthermore, Cooper (1995) argued that cost management includes all aspects of production and distribution of the product like the supply of purchased parts, design of products and other.

On a basic level cost management is used for two aspects: (1) managerial decision making and (2) productivity improvement. The appropriate costing methods provide right type of information at the right time which helps the managers in decision making and these methods can be used for better productivity also. Cost management is presently one of the main topics of attention in the area of project management. High technology companies which were mainly worried and working with time-based competition now under the highly competitive conditions they are focusing on cost based competition. If companies are aware about new costing methods then costs are still controllable for companies. Cost management is similar to wringing out a wet cloth even when the cloth seems dry. There is also a need to improve project cost control (Nixon1998). Cost management system is like a planning and it is established to attain mainly four goals: (1) measuring cost of consumed resources used in core activities of the organization, (2) elimination of low value added activities and related cost, (3) decide the efficiency and effectiveness of key activities performed in organization and (4) determining value of new activities that pick up future performance of the organization (Lisa 2002).

Cost Management is the area in accounting that deals with methods of costing products and services and it provides managers and higher authority relevant information to planning and control of costs in the short run and in the long run (Horngren et al. 2006). The intention of cost reduction says correct and improve cost management, prevention of wasted and non-effective costs and also prevention of wasting resources not the cutting of improvement costs. Cost management should be involved each stage of a product's life cycle and cost reduction in different stages individually does not direct whole cost reduction of product. Shields & Young (1991) argued that the whole life costs should be the primary focus of cost management in changing market environment. Cost management can be used as a performance measure to facilitate an organization to incorporate change into the quality of product or service (Brimson & Antos 1994). Costs cannot be managed if the origin of cost is not identified or causes of costs should be identified and costs do not simply occur but costs are caused by activities. Langfield et al. (2006) defined cost management, as the improvement of a firm's cost effectiveness by understanding and managing the real causes of cost. However the critical focus of cost management is on costs though it also tries to improve other aspect such as quality and price of product. Drury (2008) said that cost management refers to those actions that managers take to reduce costs and the ideal situation is to take action that can both reduce costs and

enhances customer satisfaction. Hilton et al. (2006) defined cost management as a philosophy of seeking increased customer value at a reduced cost, an attitude that all costs are caused by management decisions and a reliable set of techniques that increases value and reduces costs.

Therefore finally cost management can be concluded as a system which involves actions taken by managers to reduce cost, to increase customer's value and managers are aware about the effect of their decisions on the costs. In cost management both financial and nonfinancial information has importance for the success of the company and due to this reason the function of cost accounting and management has extended. Cooper (1995) argued that behavioral and organizational factors such as top management support, sufficient internal resources, training, commitment, motivation etc. influencing the success of cost management systems implementation. Cost management and cost control are sometimes used as similar terms. Drury (2008) stated cost management includes all those actions that are taken by management to reduce costs by studying the cost drivers and suggesting improvements in processes. This helps in process improvements and related cost reductions with customer satisfaction.

According to Drury (2008) cost control denotes the comparison of actual results with the budget or standard, analyzing variances that occur and finally establishing remedial actions to prevent deviations from the set standard. At present the firm's cost management systems must be dynamic to adjust with the quickly changing environment, increasing range of products and manufacturing processes. Now cost management has turned from a traditional role to strategic cost management. Monden & Hamada (1991) pointed out that in keen competition cost management is essential to launch new products at lowest cost which can also meet customers' demands as well as reduce costs of existing products by eliminating wastes.

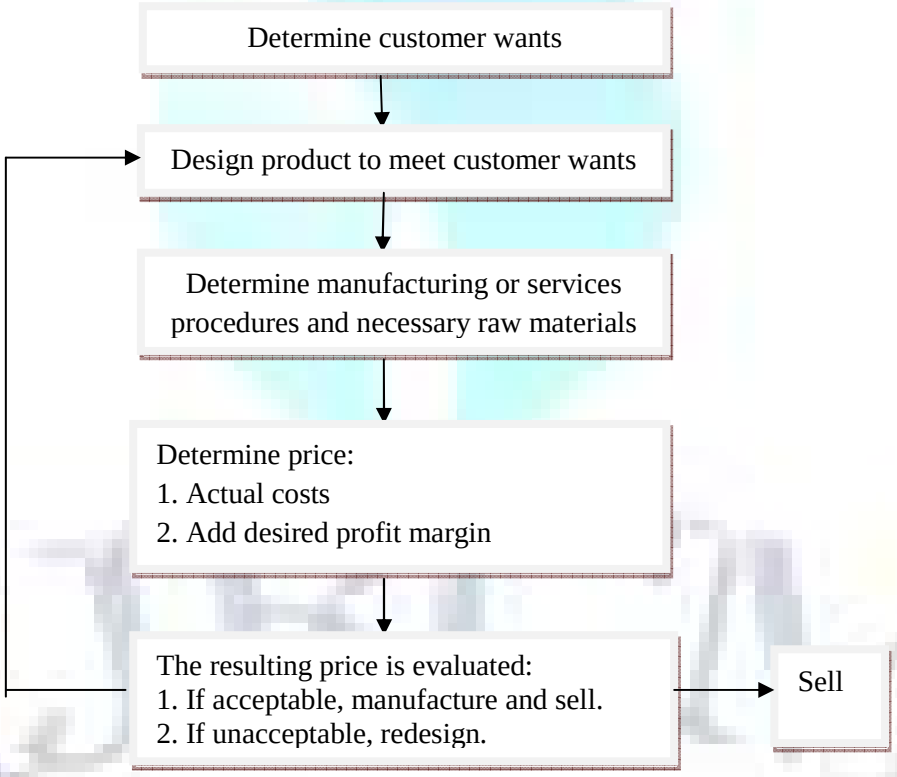
TRADITIONAL COST MANAGEMENT SYSTEMS

Volume-based systems are also known as traditional/conventional costing systems. Traditional costing system was developed in the 1920s (Johnson & Kaplan 1987). In 1920s manufacturing companies were working on mainly labour intensive techniques and production processes were also very simple (Kidd 1994). The overhead cost was allocated on labour basis therefore, a product consuming more overheads cost because single absorption/allocation base was used to allocate overheads cost and it may not be appropriate and this is the key reason that traditional costing systems provide inaccurate product costs. Traditional costing systems perform a poor job of attributing the expenses that do not support adequate allocation of resources to the production (Cooper & Kaplan1988a). In traditional costing total manufacturing cost is the sum of direct materials cost, direct labour cost and direct manufacturing costs and to obtain a full cost estimate including indirect or non-manufacturing overheads and the indirect manufacturing overheads cost for each product were usually distributed through two stage processes. First separate out the indirect cost which is directly used in the manufacturing processes of the concerned product like plant depreciation, supervisors' wages and factory cleaning. Second for overheads cost allocation departments use different factors which are seemed most appropriate as base like direct labour cost base, direct materials cost base or machine hours base for overheads cost allocation which cannot be separated or for common costs.

Traditional costing methods are used to hold only the financial accounting requirements and the costs allocated to a specific product are not causally related to its value. Traditional costing methods focus primarily on lowering product costs.

Traditional cost-based pricing which is illustrated in figure 1.2 is used to determine price of new product when products were long-lived and there was comparatively little competitive markets.

FIGURE 1.2: TRADITIONAL COST-BASED PRICING FOR A NEW PRODUCT



Source: Adapted from (Morse et al. 1996)

FAILURE / LIMITATIONS OF TRADITIONAL COST MANAGEMENT SYSTEMS

Traditional cost-accounting approaches have been used by manufacturers well over a long period but due to the changing nature of the modern manufacturing environment traditional cost-accounting approaches are no longer think suitable (Gagne & Discenza 1993). Conventional cost management and cost plus pricing strategies are not very effective in current environment (Castellano & Young 2003). In the same way Monden & Lee (1993) said that standard cost systems are being used as the primary cost control measure for the last several decades but now this seems not much effective in present market environment. In today's competitive environment such traditional cost-based pricing methods may not be successful. Morse et al. (1996) argued that fierce competitive pressures have reduced the lifecycle of products and the time to bring new products to the market. Morse et al. (1996) outlined that the cost-plus pricing methods do not involve suppliers in the early stages of product design even after the final product is designed, therefore the failure to involve suppliers causes of delays and it reduce possibilities of low cost production. Druker (2005) used the cost-driven pricing as a "deadly business sin" and stated that most American and European companies were using this system and often they dropped a perfectly good product because it was priced incorrectly. Morse et al. (1996) said that cost-based

prices are no longer suitable in today's competitive environment. Several old management methods and techniques are useful to improve one or more functions or processes in an industry but the old methods do not take the complete life cycle of product into consideration.

Traditional cost systems provide distorted information and too late to be used in reducing cost. Conventionally, the cost of products was constructed for balance sheet purposes and for information not for improvement. In traditional costing methods companies firstly develop products then calculate the product's costs and after this add a profit margin to determine sale price but this price can be accepted or not in market. These limitations of traditional costing methods demanded the implementation of new management accounting systems that focuses on entire value and profitability of the product (Maskell & Baggaley 2002). Cooper & Kaplan (1987) revealed that the main limitations of traditional costing systems occur from the use of volume related bases and traditional costing systems were appropriate decades ago for a less competitive environment considerably different from that of today. The major criticism of traditional costing systems is the distortion costing information which is not according changes in production technology. Cooper & Kaplan (1988) highlighted a number of factors that root the distortions of information resulting from the use of traditional costing systems and these factors are production volume diversity, complexity diversity, size diversity, material diversity and set-up diversity. Mishra & Vaysman (2001) stated that the implementations of traditional costing systems are less expensive though these systems provide distortions in product costing. Managers if take decisions about the product-mix, cost control, pricing and other decisions according the distorted information then these may lead long-run losses for company. Kaplan (1988) pointed out some reasons of traditional costing systems failure these are: (1) lack of feedback about the use of resources and operational control (2) measurement difficulty of individual product costs and profits (3) not realization of competitive advantages, (4) depends on outside competitors and suppliers (5) not draw attention to those activities which generate the extra overhead cost and (6) weak control on activities.

Bastl et al. (2010) stated that traditional costing practices are unable to work in an inter-organizational focus and not allied costing information. Drury (1996) highlighted the main criticisms of conventional management accounting practice as: (1) these practices do not meet the requirements of today's manufacturing and competitive environment, (2) traditional costing systems give misleading information for decision-making and (3) conventional management accounting focuses entirely on internal activities and give little attention to the external environment. Johnsons & Kaplan (1987) stated that traditional management accounting systems turn out ambiguous management information and the traditional bases of cost allocation become irrelevant in current environment. Many firms have realized that traditional costing systems like standard costing are inadequate to identify appropriate costs in manufacturing processes and now manufacturing firms are moving to adopt target costing and kaizen costing as an emerging strategic management tools. The old cost management systems fail to provide correct and quickly product costs information. Traditional cost systems have been severely criticized by different authors since the late 1980s. Finally the main drawbacks of traditional cost systems is that they provide inappropriate measures for indirect or overhead costs allocation and leading distorted product costs information.

TRADITIONAL COST MANAGEMENT SYSTEMS VS. NEW COST MANAGEMENT SYSTEMS

According to Drury (2008), during 1980s, traditional management accounting practices were criticized and new approaches that are more adjustable with today's business environment are advocated. The center of attention of the traditional management accounting practices was on just comparing actual results with fixed standard (typically a budget), to identifying and analyzing variances and taking corrective action to ensure that upcoming outcomes conformed to budgeted outcomes. Therefore the traditional management practices were based in the preserving of the standard or status quo and the ways of performing existing activities were not changed. The stress of the traditional management accounting practices was on cost control/containment rather than cost reduction while new approaches to cost management focus on cost reduction than cost containment (Drury 2008). Traditionally, manufacturers were worried only about the cost incurred up to production time and not much attention was shown for the cost incur after production. Intensified competition of present market along with the high technology have been increased the responsibility of the manufacturers. New cost management systems become more important as manufacturers become more conscious about both environmental and customer service costs. Traditional management accounting systems were designed to use an era in which people worked without technology.

Now in cost management systems, costs become a device for continuous improvement and it is used by management to achieve a competitive advantage. Traditional cost management methods focus on cost containment (control) which tries to sustain previous condition while modern cost management methods focus on cost reduction and try to lower costs to pre-established levels. The traditional management accounting practices are criticized in the literature though these are used even in today's environment by many manufacturing companies but big enterprise are now moving towards new management accounting systems for cost management. Traditional costing systems have a tendency to control the work of employees, not learning effect on the employees (Kaplan & Cooper 1998). The new methods of cost accounting help to remove this problem by using financial information with non-financial information (Kaplan & Cooper 1998).

According to Langfield et al. (2006) the major differences between the concepts of traditional and modern cost management systems are shown in table 1.2.

TABLE 1.2: TRADITIONAL COST MANAGEMENT SYSTEMS VS. NEW COST MANAGEMENT SYSTEMS

Traditional cost management systems	Modern cost management systems
• Manager's control costs through predetermined goal, with the use of budgeted or standard cost and these systems mainly focus the cost results or outcomes. • The major focus is on controlling costs of products in the organization. • Managers control costs through reporting results on the basis of the functional areas like production, marketing and administration.	• Reduces costs by finding wasted resources and eliminating these wastes through finding the factors that force costs. • The major focus is on controlling costs and achieving better quality or value for the customer. • Recognizes the customers' requirements which are met by processes in cross functional areas.

Source: Adapted from Langfield et al. (2006).

Due to the criticisms of traditional methods changes or innovation take place in management accounting. The innovations in management accounting offer more significant, accurate and appropriate information for decisions within a proper time period to resolve the problems of traditional management accounting techniques (Preda & Watts 2004). Hence managers are encouraged to use the new costing systems to avoid wrong decisions regarding products. As global competition has enlarged it has increased pressure on firms to follow excellence in terms of quality and cost, and with the use of outdated costing systems it is difficult to attain excellence in quality and cost. However, literature states that the conventional cost management focuses more on running processes and less on innovations. Nevertheless, later due to the better awareness of target costing in the 1990s (in the Western world), cost management give more attention on innovation processes and new product development (Cooper & Slagmulder 1997).

ADOPTION OF MODERN / STRATEGIC COST MANAGEMENT

Cost management is often associated with cost reduction programs. However, the endeavors of cost management are to remove costs that stand no longtime potential of success (Voigt & Sturm 2001). To keep costs down today the competitive environment demands the use of sophisticated cost management practices. Hence mainly in the field of innovations, cost management which is proactive can be fruitful. Now cost management focuses on change, cost reduction and continuous improvement. Cost management and management accounting has developed to response present business environment. Many cost management methods are known and developed by engineers to adjust and response against industrialization (Johnson & Kaplan 1987). High competition requires adoption of modern cost management techniques to manage costs. To achieve higher global ranking and stability in international markets companies' management are moving to consider new management style called strategic cost management. Today manufacturing firms focus on different aspect of cost management. To fulfill their goals mostly manufacturing companies have adopted a number of modern techniques such as just-in-time, total quality management, lean manufacturing, target costing and process improvement etc. and the objectives of all these techniques is to reduce cost of product and

improve quality. Today the critical objective of manufacturing industries is increasing productivity, management of product cost and incremental improvements which can be achieved by using modern cost management techniques like kaizen costing and target costing. Now companies are taking interest in modern cost management systems and have moved to use these techniques. Modern cost accounting systems are effective and appropriate and provide information with multi-dimensional focus on customers, functions, processes, products, services, and activities.

Strategy is defined as a set of goals and precise action plans which leads the desired competitive advantage (Thompson 1995). Clark & Fujimoto (1991) said that strategic thinking is merely the ability to adapt the organization so that it can do well in its future environment. Chandler (1962) defined strategy as "the determination of the basic long-term goals and objectives of an enterprise, the adoption of courses of action, and the allocation of resources necessary for carrying out these goals". Strategy is about performing different activities from competitors or similar activities performing in different ways. In general strategic management is related to long term planning about the organization's future performance. The goal of strategic cost management is to create sustainable competitive advantage and it is difficult to maintain a competitive advantage in current market situations. Strategic management involves the execution and identification of goals and action plans. The rising pressures of technological innovation, global competition and changes in business processes have proved strategic cost management essential for any firm. As the part of strategic cost management long-term thinking involves expected changes in products and production processes to accommodate customer demands where flexibility is important. The capability to make fast changes is critical (Blocher et al. 1999). Strategic cost management is not a technique or a tool but it is a philosophy or the process of integrating cost management, the objective of which is to reduce costs to best possible products/services with available resources. It is a specific term which helps in major strategic decisions and covers the use of cost and management accounting and all costing methods have a role to play in this system. According to Hansen & Mowen (2003) strategic cost management requires integrative thinking to identify and solve problems through a cross-functional view. The integrative approach combines skills of all functions like marketing, production, finance and accounting at the same time though the cross-functional teams. The integrative approach is suitable in a dynamic and competitive environment and it organizes cross-functional teams of specialists from different departments that all endeavors for a certain goal such as cost, quality, and lead time through integrated planning and execution system (Holland et al. 2000). The strategic variables cost, quality and time are rising as important cost management factors and these has moved from a traditional role to broad product costing and operational control in strategic cost management (Blocher et al. 1999, Hansen & Mowen 2003).

Strategic cost management is not merely cost management but it can improve revenues, productivity, customer satisfaction and position of the company. Strategic cost management is the success-driver of the company which can contribute in shaping the future of the company. Cooper & Slagmulder (1998) discussed that strategic cost management is the application of cost management techniques to reduce costs and to improve the position of the company. Shank & Govindarajan (1993) stated that strategic cost management is the managerial use of cost information to hold the strategic objectives of the company. Strategic cost management has been studied for the use of target costing technique (Ansari & Bell 1997). Literature states that cost management includes two main aspects in its scope namely, cost management system and cost management structure. Where cost management system includes activities like cost planning and cost monitoring and the techniques which can hold cost management activities and objects like resources, processes and products while cost management structure is related with cost management framework. Granlund (1996) acknowledged that strategic cost management is about managing costs for two aspects financial and competitive advantage. Cooper & Slagmulder (1997) noted that highly competitive markets have low profit margins and low customer loyalty. Now fierce competitions between competitors and consumers demands have increased the importance of strategic cost management. Cooper (1995) pointed out that a firm has to reduce its products costs as speedily as its competitors to maintain its profit margin for long time. Therefore all firms have to handle costs forcefully in order to survive in market.

CONCLUSION

There are different traditional and contemporary cost management techniques. The traditional cost management techniques are used by many organisations but these have limited area of work and also due to their limitations modern cost management techniques are adopted by organisations to manage their costs. It is noted that traditional and contemporary cost management techniques focus different aspects for cost management. The traditional cost management techniques can be used for cost management but performance of a firm can be improved with the use of contemporary cost management techniques because contemporary cost management techniques are better than traditional cost management techniques. The limitations of traditional cost management techniques was the main reason of the adoption of contemporary cost management techniques by many organisation in the changing business environment and limitations of traditional cost management techniques can be removed with the use of contemporary cost management techniques such as provide better decision making base, time to time information, correct cost determination etc. The main difference between traditional and contemporary cost management techniques is that old techniques focus only cost control while modern techniques focus on both cost control and cost reduction by elimination of wastes therefore the study suggests that adoption of contemporary cost management techniques is better option for companies to manage their costs.

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JOB SATISFACTION AMONG THE EMPLOYEES OF INSURANCE SECTOR: A STUDY OF SELECTED PRIVATE INSURANCE COMPANIES IN RAJASTHAN

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ABSTRACT

The success of any organization depends very much on customer satisfaction. A high level of customer service leads to customer retention, thus offering growth and profit opportunities to the organization. There is a strong relationship between customer satisfaction and job satisfaction. This study is conducted with a sample size of 150 employees in Rajasthan, to study the factors which affect job satisfaction level among private insurance sector. The study is descriptive in nature as different variables like gender and designation have been taken which play an important role in the satisfaction level of employees. It focuses on the relative importance of job satisfaction factors and their impact on the overall job satisfaction of employees in insurance sector .The result shows that how these demographic variables the most important factors are contributing to job satisfaction. The study is descriptive in nature and the data was collected through self-designed questionnaire survey of private sector insurance companies of Rajasthan. This paper presents a comprehensive diagnosis of job satisfaction indices, & suggestions to improve them. The study concluded that these variables play an important role in the satisfaction level of employees.

KEYWORDS
Job Satisfaction, Customer retention, Variables.

INTRODUCTION

As we know in today's scenario Insurance industry occupies a prominent place among the various financial services that operate in the world. Insurance is financial risk protection instrument. The main function of the insurance is to provide protection against the probable chances of miss happenings. Insurance has increased several quality products to meet their requirement the different classes of prospects have started demanding different types of products. It not only increases the savings habit of the customers, but also protects the policyholders' family.

In this competitive environment the success of the organization depends on the customer satisfaction Customer satisfaction is linked with the job satisfaction of employees. As the Insurance Sector is growing employee's contribution in the success of the organization cannot be denied.

It is vital for the organization to identify the factors that lead to satisfaction of the employees and also to identify the impact of the demographic variables on the satisfaction level of employees. Several factors come together to determine the job satisfaction including the basic factor like pay, work, supervision, promotion, co-workers, work environment and the demographic attributes of the employees. Generally job satisfaction means different thing to different people.

Different factors can satisfy different group of people. So the primary objective is to identify the factors that affect the job Satisfaction.

Job satisfaction represents one of the most complex areas facing today's managers when it comes to managing their employees.

Many studies have demonstrated an unusually large impact on the job satisfaction on the motivation of workers, while the level of motivation has an impact on productivity, and hence also on performance of business organizations.

Job satisfaction is an affective or emotional response toward various facets of one's job. A person with a high level of job satisfaction holds positive attitudes towards his or her job, while a person who is dissatisfied with his or her job holds negative attitudes about the job. It is of key significant in the field of organizational behavior and the practice of human resource management. It is one of the most widely discussed and researched topic.

REVIEW OF LITERATURE

Employee Satisfaction plays a significant role in enhancing the operational performance of organizations (Organ, 1977). Satisfied and motivated employees create higher customer satisfaction and in turn positively influence organizational performance (Hooi , 2007) Job satisfaction is the key ingredient that leads to recognition, income, promotion, and the achievement of other goals that lead to a feeling of fulfillment (Kaliski, 2007).

Employees with a high level of job satisfaction will appear to the customers as more balanced and pleased with their environment, leading to positive influence on the level of customer satisfaction (Homburg and Stock, 2004)Employee satisfaction can be defined as a pleasurable or positive emotional state resulting from the appraisal of one's job or job experience (Locke, 1976). Job satisfaction tends to increase with job level in the organizational hierarchy.

Thus higher the management position the greater the job satisfaction (Porter and Lawler, 1965) . A case study from a previous African study identified the most important human resources tools to manage job satisfaction; these include materials, salary, training, the working environment, supportive supervision and recognition (Mathauner et al, 2006).

Lester (2010) concluded that life and non-life premiums are very low relative to expected levels given per capita income and demographic characteristics, and examine the causes of such poor performance. Henning & Jardim, (1977) indicate that males are more satisfied with their jobs that require problem-solving because they are more result-oriented while Mason, (1994) indicate that females are more satisfied Vroom in his definition on job satisfaction focuses on the role of the employee in the workplace. Thus he defines job satisfaction as affective orientations on the part of individuals toward work roles which they are presently occupying (Vroom, 1964).

The concept of job satisfaction has long been studied and reported on in theories such as Maslow's Hierarchy of Needs (Maslow, 1943) and Herzberg's Motivation Hygiene Theory (Herzberg, 1959). Kovach, (1977), stated that Job satisfaction has been recognized as a component of organizational commitment. It is a result of employee's perception of how well their job provides those things that are viewed as important. Mitchell and Lasan (1987) said, it is recognized in the organizational behavior field that job satisfaction is the most important and frequently studied attitude thus we can say that job satisfaction is a result of employees' perception of how well their job provides those things which is viewed as important.

Antony Joseph (1996) in his article "Job satisfaction among transport employees", concluded that most of the employees feel tension during working time.

Job satisfaction is concerned with how well a worker's expectations at work are in tune with outcomes (Khan, Bashir and Ramay, 2008).

Employees with a high level of job satisfaction will appear to the customers as more balanced and pleased with their environment, leading to positive influence on the level of customer satisfaction (Homburg and Stock, 2004)Employee Satisfaction is the satisfaction of employees with their jobs or the degree to which employees like their jobs and considers job satisfaction as an attitudinal variable which reveals the extent to which an individual likes his job and is always positively related to job performance. (Spector, 1997)

Lester (2010) concluded that life and non-life premiums are very low relative to expected levels given per capita income and demographic characteristics, and examine the causes of such poor performance.

Henning & Jardim, (1977) indicate that males are more satisfied with their jobs that require problem-solving because they are more result-oriented, while Mason, (1994) indicate that females are more satisfied. Because women enter the work environment with the expectation of being able to socialize, they are more satisfied with jobs that allow them to interact with others.

According to Hansanbanu, and Nagajyothi, in (2007) there is significant relationship between age, educational qualification, gender, occupation and income of respondents and their level of investment with taking LIC policies and in their study they also found that there is no significant relationship between marital status, family type and family size and their investment in insurance sector

Henning & Jardim, (1977) indicate that males are more satisfied with their jobs that require problem-solving because they are more result-oriented, while Mason, (1994)

Studies also indicate that females are more satisfied. Literature also supports that workers with more educated and high designation employees have a higher job satisfaction level, while other studies indicate that workers with more education have a lower job satisfaction level.

IMPORTANCE OF THE STUDY

This study is significant in knowing the level of job satisfaction among the employees of selected private insurance companies of Rajasthan and knowing the commitment of the employees towards the organization. The main purpose of the study is to examine the relationship between Job Satisfaction and other variable like gender and designation of the employees. As Insurance Sector is growing employee's contribution in the success of the organization which cannot be denied. It occupies a prominent place among the various financial services that operate in the world.

STATEMENT OF THE PROBLEM

It is clear that job satisfaction is a feeling of pleasure an employee gets from the performance of a job. It is most important in human behavior. While an organization with more number of dissatisfied workers is always facing problems of frequent friction with its employees productivity, high rate of absenteeism, sudden stoppage of work, etc, one with a larger number of satisfied workers confronts no such problems. Further, it is crucial to the effective achievement of organizational goals. The problem is that job satisfaction differs with various designations and also gender wise.

OBJECTIVES OF THE STUDY

The main objective of the study was to find out the level of job satisfaction among the employees of insurance industry. The secondary objectives are as follows:

- To measure gender wise satisfaction level among the employees of insurance industry
- To measure designation wise satisfaction level among the employees of insurance industry.

HYPOTHESIS

- HO: There is no significant difference between Gender and job satisfaction in insurance sector
- H1: There is a significant difference between Gender and job satisfaction in insurance sector
- HO : There is no significant difference between designation of a person and job satisfaction.
- H1: There is a significant difference between designation of a person and job satisfaction.

RESEARCH METHODOLOGY

The study is based on primary data through self-administered questionnaire filled by the employees of insurance companies of Rajasthan and is descriptive in nature. A descriptive research design and correlation technique has been used for the purpose of the stud y and survey method is applied in the study. In the study both primary and secondary data has been used Secondary data were collected from available Books, publications, research studies, articles and websites And gender and age wise classification is done in order to understand as to how much gender differences and different level of positions affect job satisfaction among employees. A sample size of 150 employees is taken for the study and mainly from sales department and other various managerial positions for the study and accordingly diagrammatic presentation has been done for the same.

TABLE 1: GENDER WISE CLASSIFICATION

		GENDER		
		Female	**Male**	**Total**
I am satisfied working with this company	Strongly Agree	9	21	30
	Agree	24	35	59
	Neutral	11	11	22
	Disagree	27	7	34
	Strongly disagree	4	1	5
	Total	75	75	150

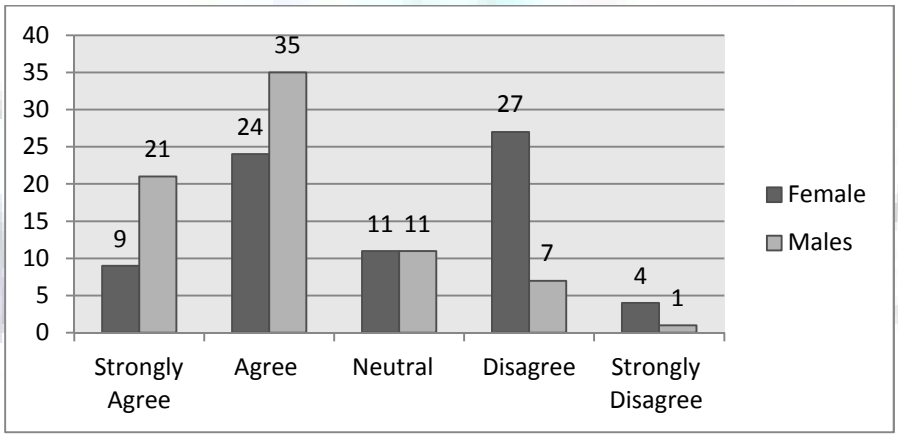

TABLE 2

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.416(a)	4	.000
Likelihood Ratio	21.487	4	.000
Linear-by-Linear Association	18.906	1	.000
Total Sample Size	**150**		

RESULTS AND DISCUSSION

HO: There is no significant difference between Gender and job satisfaction in insurance sector

H1: There is a significant difference between Gender and job satisfaction in insurance sector.

After testing the level of job satisfaction in insurance sector it was imperative to test whether gender of a person plays any role in maintaining job satisfaction. Therefore, cross-tabulation was done between gender and job satisfaction.

TABLE 3: DESIGNATION WISE CLASSIFICATION

		DESIGNATIONS					
		Sales Executives	**Sales Manager**	**Asst. Managers**	**Senior Manager**	**Branch Manager**	**Total**
I am satisfied working with this company	Strongly Agree	2	3	2	8	15	30
	Agree	11	12	14	12	10	59
	Neutral	4	8	5	3	2	22
	Disagree	4	17	5	4	4	34
	Strongly disagree	0	1	2	1	1	5
	Total	21	41	28	28	32	150

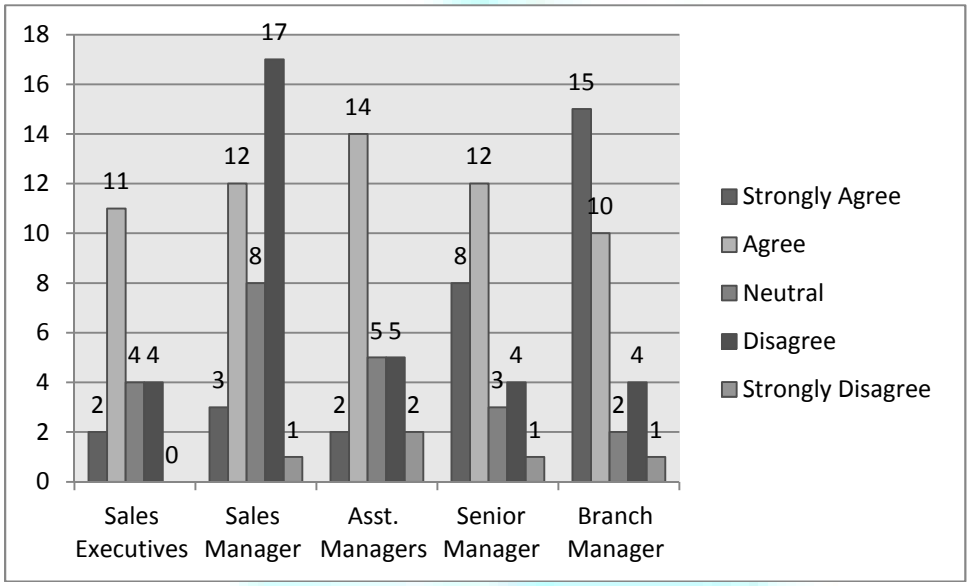

TABLE 4

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.864(a)	16	.002
Likelihood Ratio	35.591	16	.003
Linear-by-Linear Association	11.305	1	.001
Total Sample Size	**150**		

TABLE 5

		Designations					
		Sales Executives	**Sales Manager**	**Asst. Managers**	**Senior Manager**	**Branch Manager**	**Total**
I am satisfied working with this company	Strongly Agree	2	3	2	8	15	30
	Agree	11	12	14	12	10	59
	Total	21	41	28	28	32	
	% of satisfaction	62	37	57	71	78	

RESULTS AND DISCUSSION

HO: There is no significant difference between designation of a person and job satisfaction

H1: There is a significant difference between designation of a person and job satisfaction.

Several researchers reported that in industrial setting, job satisfaction and job involvement increases with increase in designation and as a result occupational stress decreases. Therefore it was needed to study the impact of position on job satisfaction in insurance sector to test this cross-tabulation was used between designation of a person and his job satisfaction.

FINDINGS

The findings of the study are as follows:

From table 1 it can be observed that Asymp. Sig. Value is 0.000 which is less than 0.05 hence the null hypothesis H0 is rejected and it can be fairly concluded that there is a significant difference between the job satisfaction of males and females. It shows that there are 9 females who strongly agree and 24 who agree that they are satisfied with their jobs as opposed to 21 males who strongly agree and 35 males who agree so a total of 33 females out of 75 are satisfied with their jobs while 56 males out of 75 are satisfied with their jobs.

From table 4 it can be observed that job satisfaction increases with increase in designation and position. It was observed that the Asymp. Sig. value was 0.002 which is less than 0.05 and hence the null hypothesis is rejected so there is a significant difference between designation a person and job satisfaction. As already mentioned job satisfaction increases with increase in position. From Table 5 it can be seen that maximum number of respondents who agree or strongly agree that they are satisfied with their job, lie in the designation of Senior Manager and Branch Managers. Table 5 also suggests that a total of 78% respondents with the designation of Branch Managers were satisfied with their job which is highest.

RECOMMENDATIONS /SUGGESSTIONS

The following recommendations can be considered as opportunities for future study have emerged as a result of this study. In addition to overcoming the limitations of data gathering, additional research is needed to observe the relationships between job satisfaction and work conditions, pay and promotion, fairness, job security, relationship with supervisor and co-workers, salary and other factors The limitations have contributed to the lack of arriving at many strongly statistically proven findings and conclusions. For future research the following suggestions should be considered and taken care of:

1) It is suggested that for future research a proportionate stratified random sample be used to compare several other organizations using a larger sample.
2) The research is needed to further investigate the potential relationships and affects these variables and other extraneous variables, such as role ambiguity, job level, contingent rewards and co-work have on job satisfaction.
3) Qualitative investigators must conduct research regarding the job satisfaction of pharmaceuticals companies. This research method will provide a different perspective of employees, job satisfaction and contribute a more in-depth understanding of how employees view their job.

However private sector insurance employees are offered comparatively better chances to learn more about the insurance plans, special features, company's rules and regulations than the government insurance company officials. Separate training department with frequent on the job training, off the job training techniques are imparted to the officials might have motivated private insurance employees to a reasonable extent.

The final objective of research work is to bring out measures to suggest insurance companies. As the job situation variables are increasing the motivational level of insurance officials private insurance company management has to give adequate importance to these variables in order to boost up the motivational level. In government insurance companies due to job security, influence of union, employees do their duty at moderate speed.

If they are provided good working environment, training, recognition, officers perform their task happily. In the case of private insurance company, officers are given higher salary, quick promotion, continuous training, do the work at a higher speed. The main issue in the case of private insurance company is job insecurity. Right steps must be taken by the management to restraint this from the mind of employees If it does so, surely they may be highly motivated. So these suggestion s play an important role in case of private sector insurance companies.

CONCLUSION

Employee job satisfaction can improve service quality and increase employee satisfaction. In this circumstance, policy makers and managers have turned their attention to provide different kinds of facilities to their employees in order to satisfy their employees. As satisfaction plays an important role in improving the performance of employees. As from the study it can be concluded that males are more satisfied in comparison to females in their job. And it can also be concluded that people with higher designation in the organization like the Branch Managers, Senior Managers are more satisfied in comparison to Sales Executives as the level of satisfaction varies according to the designation and position that a person holds in the organization. Proper motivation should be given to the employees so that they are more satisfied to work in the organization. The following points can also be considered

- Proper infrastructure facilities should be provided to ensure that employees give their best.
- Organizations can make employees friendly policies, processes and procedures to ensure that employees grow in organization.
- They can appreciate employees work.
- They can ensure proper communication process takes place and make sure that employees are heard.
- They can give regular feedback and recognition.
- They can give training to boss, if his management style is not good.
- Proper focus should be there on team building
- Creation of motivational environment

LIMITATION OF THE STUDY

- The study is limited to the boundaries of Rajasthan only.
- In convenience sampling the problem of representativeness might occur.
- It was found during the filling up of the questionnaire that some of the employees were hesitating to give correct answer of the questions.
- To formulate and calculate hypothesis took more time but it was necessary in order to get some accurate results.
- The conclusions are based on on the views expressed by those who chose to respond to the survey.

SCOPE FOR FURTHUR RESEARCH.

The scope of the study is wide. It gives a comprehensive platform of information and facts about the job satisfaction and its effectiveness criterion which is now becomes the prime factor for the organization's The emphasis of the study will be on collecting and analyzing the content and context variables with relation to that of job satisfaction. The milieu of the study is limited to Rajasthan

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ANNEXURE

QUESTIONNAIRE

Name of the Respondent: .....

Gender: Male € Female €

Age: 18 -2 5 € 25-35 € 35-45 45-60 € 60 and above €

Contact No: .....

Address : .....

Q .1 In which Private Insurance Company you are currently working In?

.....

Q.2 How long you have been associated with the company?

a) 0-1 Years € b) 2-5 Years € c) 6-10 Years € d) More than 10 years €

Q.3 Are you satisfied working with the company

a) Yes € b) No €

Q.4. Does satisfaction plays an important role in improving your performance

a) Yes € b) No €

Q5. What is your designation in the organization?

a) Sales Executive € b) Sales Manager € c) Asst. Manager € d) Senior Manager € e) Branch Manager €

Q6. Do you wish to stay with the company in future as well?

a) Yes € b) No

CORPORATE FUNDING OF POLITICAL PARTIES UNDER NEW COMPANY LAW

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ABSTRACT

The Companies Bill has been passed by both the houses of Parliament, Lok Sabha passed it on December 18, 2012 and Rajya Sabha passed it recently on August 08, 2013. The bill has been welcomed with open arms by almost all the Indians. The bill seeks to replace more than half century old Companies Act, 1956 enacted on the lines of English Company Law. The bill consists of number of provisions aimed at strengthening Corporate Governance framework of India and giving greater protection to minority shareholders while protecting the democracy of all the stakeholders. Amongst such worthy and admirable provisions is a provision on Corporate funding of Political Parties which needs substantial attention. The fascinating clause is the increase in the limit of political contribution by corporations in an environment which is widely accepted as being highly corrupted. This paper seeks to find out how relevant this increase is for the modern India.

KEYWORDS
Companies Bill, Corporate Funding, Political Funding, Political Party.

INTRODUCTION

The wait was finally over for India when on August 08, 2013, the Rajya Sabha passed the much-awaited Companies Bill after it was passed by Lok Sabha last year on December 18, 2012. With the passage of the Bill, India looks forward to being globalized in true sense. The existing Companies Act, 1956 is almost six-decades old and has become obsolete in the light of changing business environment of the modern India. Once the President of India gives his assent, the Bill will be enacted as a law, making the outmoded Companies Act, 1956 redundant. However, the journey was neither short nor smooth. It took almost 20 years to this bill to take birth. The process started long back in 1993 when a Working Group was established to make a comprehensive review and revision of the Companies Act after India announced liberalization of its economy in 1991. The Companies Act, 1956 was amended as many as 25 times to keep pace with the liberalized and globalized business environment but a complete overhauling of the Act was the need of the hour. The process was steered by the setting up of the J.J. Irani Committee in 2004 and later by the Satyam Scam of 2009,the largest scam in India till date.

Since the day the bill has been introduced, it is receiving constant praise and support for its emphasis on strengthening the corporate governance. The Bill for the first time introduced the formation and registration of One Person Company, duties of the directors have been clearly stated, independent directors have been defined and the concept like Corporate Social Responsibility grabbed the attention of all the Indians whether or not having a direct interest in the provisions. A brief account of various provisions of the Companies Bill has been given below:

- A private company can have a maximum of 200 members, which previously was 50 in the Companies Act, 1956.
- The concept of One Person Company introduced. It means only one person can form a company in comparison to minimum two shareholder previously. It will be a private limited company only.
- Concept of dormant companies introduced. It can be formed for a future project or to hold an asset or intellectual property.
- Money raised through a prospectus cannot be used for dealing in equity shares of another company. If a company changes terms of the prospectus or objects for which money is raised, it shall provide dissenting shareholders an exit opportunity.
- Apart from existing shareholders, if the Company having share capital at any time proposes to increase its subscribed capital by issue of further shares, such shares may also be offered to employees by way of ESOP, subject to the approval of shareholders by way of Special Resolution.
- NBFCs not covered by the provisions relating to acceptance of deposits. They will be governed by Reserve Bank of India Rules.
- Companies can accept deposits only from its members, that too after obtaining shareholders approval.
- Acceptance of deposit also subject to compliance with certain conditions -
- Public companies can accept deposit from public on complying certain conditions like credit rating.
- Listed companies required to file a return in a prescribed form with the Registrar regarding any change in the number of shares held by promoters and top 10 shareholders of such company, within 15 days of such change.
- Postal Ballot to be applicable to all the companies, whether listed or unlisted.
- Interim dividend in a current financial cannot exceed the average rate of dividend of the preceding three years if a company has incurred loss up to the end of the quarter immediately preceding the declaration of such dividend.
- Every company is required at its first annual general meeting (AGM) to appoint an individual or a firm as an auditor. The auditor shall hold office from the conclusion of that meeting till the conclusion of its sixth AGM and thereafter till the conclusion of every sixth meeting. The appointment of the auditor is to be ratified at every AGM.
- Individual auditors are to be compulsorily rotated every 5 years and audit firm every 10 years in listed companies & certain other classes of companies, as may be prescribed.
- A partner or partners of the audit firm and the firm shall be jointly and severally responsible for the liability, whether civil or criminal, as provided in this Bill or in any other law for the time being in force. If it is proved that the partner or partners of the audit firm has or have acted in a fraudulent manner or abetted or colluded in any fraud by, or in relation to, the company or its directors or officers, then such partner or partners of the firm shall also be punishable in the manner provided in clause 447.
- Prescribed class or classes of companies are required to appoint at least one woman director.
- At least one director should be a person who is a ordinary resident in india in previous calendar year
- At least one-third of the total number of directors of a listed public company should be independent directors.
- Existing companies to get a transition period of one year to comply.
- Liability of independent directors and non-executive directors not being promoter or key managerial personnel to be limited.
- A person can hold directorship of up to 20 companies (previously 15 companies), of which not more than 10 can be public companies.
- Companies with more than 1,000 shareholders, debenture-holders, deposit-holders and any other security holders at any time during a financial year to constitute a Stakeholders Relationship Committee, with a non-executive director as a chairperson and such other members as may be decided by the board.
- No permission of central government required to give a loan to a director.

- The provisions on inter-corporate loans and investment (372A of Companies Act 1956) extended to include loan and investment to any person.
- No central government approval required for entering into any related party transactions.
- No central government approval required for appointment of any director or any other person to any office or place of profit in the company or its subsidiary.
- The Bill makes provision for cross border amalgamations between Indian Companies and companies incorporated in the jurisdictions of such countries as may be notified from time to time by the Central Government.
- The Bill provides provisions related to Corporate Social Responsibility (CSR).
- The National Company Law Appellate Tribunal shall now consist of a combination of technical and judicial members not exceeding 11, instead of 2 as provided in the Companies Act, 1956.
- The Central Government may establish as many special courts as may be necessary to provide speedy trial of offences.
- Every company having net worth of rupees 5000 crore or more, or turnover of rupees 1000 crore or more or a net profit of rupees 5 crore or more during any financial year shall constitute a Corporate Social Responsibility Committee of the Board. The Board of every company shall ensure that the company spends in every financial year at least 2% of the average net profits of the company made during the three immediately preceding financial years in pursuance of its CSR policy. In event of failure, the Board shall in its report specify the reasons thereof.
- The new legislation has more provisions to guard interest of employees. It mandates 2 year salary payment to employee in case of company is shutting down its operations.

The above provisions undoubtedly ensure the democracy of all the stakeholders and attempt to make India's Corporate Governance framework at par with the corporate governance practices of the developed world.

But does this mean all is good with the new Companies Law?

Not really. The law still has certain issues unresolved and certain others left ambiguous. One such provision is the "Corporate Funding of Political Parties".

CORPORATE FUNDING OF POLITICAL PARTIES

It is not a new phenomenon. The corporations have been making contributions to the various political parties even before the emergence of democracy and the enactment of the Companies Act, 1956.Even the pre-independence era witnessed financing of the Indian National Congress by various big business houses such as the Birlas. Similarly, in 1957-58, the Tatas contributed a huge sum of Rs. 3,00,000 to the Congress Party.The corporate funding includes all the expenditures and contributions made to political parties whether in cash or in kind. Typically, it includes -

- any direct or indirect contributions or expenditures made on behalf of a candidate for public office,
- any direct or indirect contributions or expenditures made on behalf of a candidate contesting for elections.
- any direct or indirect payments made to the political party before during or after the elections or otherwise.
- Contributions to or expenditures on behalf of political committees and other
- politicalparties and entities organized and registered under Section 29A of the Representation of the People Act, 1951 .
- all payments for advertisements, printing and other campaign expenses of the political parties.
- all donations of company products or services to a political organization
- reimbursing someone for making a political contributions.

The list is not exhaustive and can include any kind of expenditures made for and on behalf of the political parties.

PROVISIONS IN THE COMPANIES BILL, 2012

Clause 182 of the Bill deals with prohibitions and restrictions regarding political contributions. It also provides the manner in which every company shall disclose in its profit and loss account any amount so contributed by it during any financial year. According to this clause, any company, other than a Government company and a company which has been in existence for less than three financial years, may contribute any amount directly or indirectly to any political party subject to the following:

(1) The aggregate of the amount which may be so contributed by the company in any financial year shall not exceed seven and a half per cent of its average net profits during the three immediately preceding financial years.

(2) No such contribution shall be made by a company unless a resolution authorizing the making of such contribution is passed at a meeting of the Board of Directors and such resolution shall, subject to the other provisions of this section, be deemed to be justification in law for the making and the acceptance of the contribution authorized by it.

(3) Without prejudice to the generality of the provisions of sub-section (1),—

a. a donation or subscription or payment caused to be given by a company on its behalf or on its account to a person who, to its knowledge, is carrying on any activity which, at the time at which such donation or subscription or payment was given or made, can reasonably be regarded as likely to affect public support for a Company to contribute to bona fide and charitable funds, etc. political party shall also be deemed to be contribution of the amount of such donation, subscription or payment to such person for a political purpose;

b. the amount of expenditure incurred, directly or indirectly, by a company on an advertisement in any publication, being a publication in the nature of a souvenir, brochure, tract, pamphlet or the like, shall also be deemed to be a contribution for a political purpose.—

(i) where such publication is by or on behalf of a political party, to be a contribution of such amount to such political party, and

(ii) where such publication is not by or on behalf of, but for the advantage of a political party,

(4) Every company shall disclose in its profit and loss account any amount or amounts contributed by it to any political party during the financial year to which that account relates,giving particulars of the total amount contributed and the name of the party to which such amount has been contributed.

(5) If a company makes any contribution in contravention of the provisions of this section, the company shall be punishable with fine which may extend to five times the amount so contributed and every officer of the company who is in default shall be punishable with imprisonment for a term which may extend to six months and with fine which may extend to five times the amount so contributed.

The rules for making political contributions seem to have been made more stringent and comprehensive. One of the interesting provisions in the new law is the increase in the percentage of contribution that the companies can make.

Section 293A of the Companies Act, 1956 provides that the amount or the aggregate of the amounts which may be contributed by a company in any financial year shall not exceed five per cent of its average net profits determined in accordance with the provisions of sections 349 and 350 during the three immediately preceding financial years.

The percentage of contribution has, thus, been increased from 5% to 7%. Despite the high degree of corruption prevalent in India, this legislation seeks to legitimate the corporate funding of political parties. The Parliamentary Standing Committee in its report supports this provision on the ground that the number of political parties has increased and that such donations are not made every financial year. The political parties can raise the funds from a number of sources including the central funding, state funding, donations and grants. Still the corporate funding accounts for a major portion because it is in the mutual interest of both the corporates and the political parties.

In a country like India which, as a measure of reducing corruption, opened up its economy in 1991 reducing and removing almost all the trade barriers, reducing the tax rates and allowing more private enterprises to control and appropriately use the economic resources, the corruption is still widely spread and pervasive. It is not uncommon to find a minister being jailed for corruption charges and a corporate tycoon paying crores of rupees as bribes. Perhaps one of the reasons can be a loophole in the laws which enable the parties and politicians to use the government's discretionary powers over resource allocation for their own self-

interest. Even one of the first Companies legislations, the Companies Act, 1913 did not have any provision restricting the contributions made by companies to political parties though it was recognized every now and then that it could endanger the total system of democracy.

Despite the warning bell stroked by a number of judges of the High Courts and Supreme Court, no action was unfortunately taken. High taxation regime along with the stricter regulatory framework led to the problem of black money. A portion of such black money was thus granted by the big corporate houses to the political parties and politicians while lobbying for favorable regulatory environment. As a measure of restricting the amount of funding, the Parliament in 1960 added Sec.293A to the Companies Act permitting a political contribution to the extent of 5% of net profits. However, not much of a resort was provided by this provision. In fact, such a legal provision pumped up the total contribution made to political parties legally and illegally.Thus a need for total ban on donations by companies to political parties was recognized by theSanthanan Committee Report,1962.

A serious effort was then made in 1968 when Prime Minister Indira Gandhi completely banned corporate donations to political parties to prevent the large business houses from exercising undue influence. But this could not continue for long as the total ban on corporate funding was not replaced by the state-funding of the political parties.

A well-functioning political party requires huge amount of financial resources and the amendments in the RPA Act such as those made in 1975 making the limit on expenditure by the political parties during elections practically ineffective and exempting the parties from income tax and wealth tax triggered themto raise the funds from every possible source available and the funds from the big corporate houses were, all the times, the most easiest to access and obtain. Thus in 1985, the ban was removed and the board of directors was once again allowed to make contributions to the political partiesup to 5% of the average net profit of the previous three years and disclose the same in the audited annual accounts of the company. This situation is still continuing.

Perhaps one of the major incentives for corporations to make such significant political contributions is the tax-deductibility. The National Democratic Alliance (NDA) government passed Election and Other Related Laws (Amendment) Act in September 2003 which made company and individual contributions to a political party 100% tax-deductible under Sections 80 GGB and80 GGC of the Income Tax Act respectively.

INCOME OF POLITICAL PARTIES FROM FY 2004-05 TO FY 2010-11

Over this seven years period, the total income of almost all the political parties has increased.Amongst the National Parties, the total income of INC went from Rs 222 crores in FY 2004-05 to Rs 307.08 crores in FY 2010-11 followed by BJP (Rs 104 crores in FY 2004-05 to Rs 168 crores) and BSP (4.2 crores in FY 2004-05 to Rs 115.7 crores in FY 2010-11).The table below gives an account of the income from FY 2004-2005 to 2010-011 as –

TABLE 1: INCOME OF POLITICAL PARTIES FROM FY 2004-05 TO FY 2010-11

Party	Income for FY 2004-2005 (Rs. In Lacs)	Income for FY 2005-2006 (Rs. In Lacs)	Income for FY 2006-2007 (Rs. In Lacs)	Income for FY 2007-2008 (Rs. In Lacs)	Income for FY 2008-2009 (Rs. In Lacs)	Income for FY 2009-2010 (Rs. In Lacs)	INCOME FOR FY 2010-2011 (RS. IN LACS)	Total
Indian National Congress (INC)	22207	12493	16936	22081	49688	46757.87	30708.87	200,871.74
BharatiyaJanata Party (BJP)	10412	3834	8249	12378	22002	25800.75	16800.92	99,476.67
BahujanSamaj Party (BSP)	420	976	4588.67	6974	18202	5697.5	11570.34	48,428.61
Nationalist Congress Party (NCP)	1210	737	1580	1739	4001	4484.76	2330.59	16,082.35
Communist Party of India (CPI)	50	53	68	59	106	129.37	212.23	677.6
Communist Party of India (Marxist) (CPM)	3988	4160	6340	5970	6283	7328.15	7657	41,726.15
Jammu &Kashmir National Congress (J&K NC)	RTI response awaited	RTI response awaited	113.8	331.34	1170.87	543.19	RTI response awaited	2,159.2
All India Anna DravidaMunnetraKazhagam (AIADMK)	117.56	1295.38	640.05	299.51	1250.21	974.24	1420.35	5,997.3
ShiromaniAkali Dal (SAD)	RTI Response awaited	19.62	951.7	802.82	155.91	637.38	RTI Response awaited	2,567.43
Samajwadi Party (SP)	2854	4835	8705	3230	3900	2810.43	1521.22	27,855.65
Janata Dal (United) (JD(U))	50.93	133.84	54.51	21.84	931.47	1133.04	342.16	2,667.69
Telugu Desam Party (TDP)	742.87	219.22	892.44	498.87	1230.08	1192.04	615.06	5,390.58
RashtriyaJanata Dal (RJD)	367.6	255.41	119.08	215.20	405.01	444.69	310.9	2,117.89
DravidaMunnetraKazhagam (DMK)	214.83	415.68	266.96	1681.75	1206.15	RTI Response awaited	642.84	4,428.21
All India Trinamool Congress (AITC)	RTI Response awaited	RTI Response awaited	69.07	68.97	RTI Response awaited	195.97	616.2	950.21
All India Forward Block (AIFB)	RTI Response awaited	RTI Response awaited	21.35	20.00	23.35	34.12	RTI Response awaited	98.82
Sikkim Democratic Front (SDF)	In complete ITR	In complete ITR	In complete ITR	In complete ITR	In complete ITR	In complete ITR	92.55	92.55
Shiv Sena	355.18	820.66	183.24	RTI response awaited	271.28	1347.58	312.41	3,290.35
LokJanshakti Party (LJP)	RTI response awaited	RTI response awaited	78.49	RTI response awaited	64.90	120.34	139.85	403.58
TelanganaRashtraSamiti (TRS)	16.16	41.78	36.96	87.51	183.59	296.96	374.19	1,037.15
Shiv Sena	355.18	820.66	183.24	RTI response awaited	271.28	1347.58	312.41	3,290.35
LokJanshakti Party (LJP)	RTI response awaited	RTI response awaited	78.49	RTI response awaited	64.90	120.34	139.85	403.58
TelanganaRashtraSamiti (TRS)	16.16	41.78	36.96	87.51	183.59	296.96	374.19	1,037.15

Source :Analysis of Income Tax Returns Filed and Donations Received By Political Parties, A Report by National Election Watch & Association for Democratic Reforms.

It was found that sale of coupons has been listed by most of the major political parties as one of the major sources f income. Out of the total income, Indian National Congress obtained Rs 57347 lacs from the sale of coupons. On the other hand, Janta Dal (United) received Rs 1415.56lacs from the sale of coupons. Voluntary contributions and donations have been listed as the next major source of Income by the various National and Regional parties.

SHARE OF DONATIONS IN TOTAL INCOME

Since donations account for second or third major sources of income for almost all the political parties, it is important to have a check on the amount received by the way of donations so as to prevent the political parties from exercising undue influence on the people to donate huge sums of money to them. Table 2 below presents the information on the percentage share of donations from total income.

TABLE 2: SHARE OF DONATIONS IN TOTAL INCOME FOR FY 2009-2010 AND 2010-2011

Party	Total (Rs in Lacs)	Total Donation (Rs in Lacs)	% Share of Donations from Total Income
INC	77466.74	11173.48	14.42%
BJP	42601.67	34707.5	81.47%
BSP	17267.84	9963	57.70%
NCP	6815.35	418.11	6.13%
CPI	341.60	160.96	47.12%
CPM	14985.15	6456.15	43.08%
AIADMK	2394.59	1938.23	80.94%
SP	4331.65	1827.84	42.20%
JD(U)	1475.20	1415.56	95.96%
TDP	1807.10	1137.42	62.94%
RJD	755.59	573.11	75.85%
AITC	812.17	487.11	59.98%
Shiv Sena	1659.99	1130.35	68.09%
LJP	260.19	233.85	89.88%
TRS	671.15	670.99	99.98%
RLD	436.60	0	0.00
DMK (FY 2010-2011 only)	642.84	24.33	3.78%
SDF (FY 2010-2011 only)	92.55	66	71.31%
BPF (FY 2010-2011 only)	117.50	113.6	96.68%
J&K NC (FY.2009-2010 only)	543.19	318.41	58.62%
SAD (FY 2009-2010 only)	637.38	0	0.00
AIFB (FY 2009-2010 only)	34.12	19.15	56.13%
INLD (FY 2009-2010 only)	251.56	45.45	18.07%

Source :Analysis of Income Tax Returns Filed and Donations Received By Political Parties, A Report by National Election Watch & Association for Democratic Reforms.

From the above table it can be seen that out of the 6 National Parties, Bhartiya JantaParty has declared maximum percentage share of donations as part of its total income (81.47%) while Indian National Congress has declared the least share of contribution from donations (14.42%). Telangana Rashtra Samiti (TRS) has received 99.98% of its income from donations followed by Janta Dal (United) with 95.96% and Lok Janshakti Party with 89.88% amongst the Regional Parties.

TOP DONORS OF POLITICAL PARTIES

The top donors of various National and Regional Parties can be found out from the following table:

TABLE 3: TOP DONORS OF PARTIES FOR FY 2003-2004 TO FY 2010-11

PARTY	TOP DONORS	AMOUNT (Rs. In Lacs)
National Parties		
INC	GENERAL ELECTORAL TRUST	3641
	TORRENT POWER LTD	1415
	BHARTI ELECTORAL TRUST	1100
BJP	GENERAL ELECTORAL TRUST	2607
	TORRENT POWER LTD	1300
	ASIANET V HOLDING PVT LTD	1000
CPM	SOUTHERN ENGINEERING WORKS (SEW)	35
	SEW INFRASTURCTURE LTD	25
	NUZIVEEDU SEEDS PVT LTD	10
CPI	A.B. BARDHAN (COLLECTION)	65
	COMMUNIST PARTY OF INDIA	21.61
	D. RAJA (Collection)	21.45
NCP	TORRENT POWER LTD	100
	VIDEOCON INDUSTRIES LTD	100
	SATYA ELECTORAL TRUST	100
BSP	NO DONATIONS ABOVE RS. 20000	-
REGIONAL PARTIES		
JD (U)	VIDEOCON INDUSTRIES LTD	150
	SUSHMA MARINE SERVICES	68.5
	ELECTORAL TRUST	30.54
SP	ELECTORAL TRUST	158.02
	ITC LTD	78
	GENERAL ELECTORAL TRUST	50
AIADMK	ANNA TOZHIR SANGA PEROVVAL	200
	ITC	55
	DR. V NEDUMARAN	27
SAD	AMBUJA CEMENT	75
	BHARATI ELECTORAL TRUST	50
	TRIG GUARDI FORCE LTD	21
BJD	NITIN MATHURIA, HON'BLE SECRETARY GENERAL TRUST	500
TDP	SOUTHERN ENGINEERING WORKS (SEW) INFRASTRUCTURE LTD	125
	NIPPON INVESTMENT AND FIN. CO. PVT LTD	100
	SRINIVASA RAJU CHALAPATHI	100
	TECKARE INDIA PVT. LTD.	100
	M/S BHARATI ELECTORAL TRUST	100
SHIVSENA	WONDERLAND ESTATE DEVELOPERS LTD	200
	VIDEOCON INTERNATIONAL LTD	145
	MAHINDRA & MAHINDRA	95
JD(S)	LAKSHMINARASHIMA ENTERPRISE	110
LJP	BHARATI ELECTORAL TRUST	50
	ALI'S CONSTRUCTION	10
	GOLRO ENTERPRISES PVT. LTD.	10
MNS	WADHAVA CONSTRUCTION	25
	ICICI BANDRA	25
	CRESENT SHIPPING AGENCY (INDIA) LTD	5
RLD	PUBLIC MEETING OF CH AJITH SINGH	50.23
	JAYANTH CHOUDARY	31.08
	ASHTO ESTATE PVT LTD	20
HARYANA JANHIT CONGRESS	NIL	-
AIUDF	GPS & ASSOCIATES	15
	SUKHBIR SINGH SAHNI	10
	BADRUDDIN AJMAL	1

Source :Analysis of Income Tax Returns Filed and Donations Received By Political Parties, A Report by National Election Watch & Association for Democratic Reforms.

From the table, it can be observed that –

(i) General Electoral Trust is a major donor for INC (Rs 3646 lacs) , BJP (Rs 2607 lacs) and SP (Rs 50 lacs) for the Financial Years 2003-04 to 2010-11.

(ii) Torrent Power donated Rs 1415 lacs to INC, Rs 1300 lacs to BJP and NCP received Rs 100 lacs.

(iii) Southern Engineering Works (SEW) is a major contributor to the INC (200 lacs) and CPM (35 lacs).

(iv) Videocon Industries has donated Rs 525.59 lacs to BJP, Rs 100 lacs to NCP and Rs 150 lacs to JD(U). Shiv Sena has received Rs 145 lacs from Videocon Industries between FY 2003-04 and FY 2010-11.

It was also reported that among the donors who contributed above Rs. 50 Lakhs to National Parties. General Electoral Trust was leader with contributions of Rs 36.41 crores to INC and Rs 26.07 crores to BJP between Financial years 2003-04 and 2010-11.

Second on the list is Torrent Power Limited which has contributed a total of Rs 14.15 crores to INC and Rs 13croresto BJP between FY 2003-04 and FY 2010-11

Sterlite Industries, a subsidiary of the Vedanta Group, has donated Rs 6 Crores to INC during FY 2004-05 and FY 2009-10 while The Madras Aluminium Co Ltd, also a subsidiary of the Vedanta Group had contributed Rs 3.5 Crores to BJP.

The Public and Political awareness Trust had made an overall contribution of Rs 9.5 Crores to BJP during the FYs 2003-04 and 2004-05. SEW Constructions, SEW Infrastructure and Videocon Industries areother major donors who contributed to INC, BJP, CPI and NCP.

However, for Regional Parties, Electoral Trust is one of the major donors donating Rs 158 lacs to Samajwadi Party during the FY 2004-05 and FY 2009-10.ITC is also a major donor making contributions to SP (Rs 78 lacs), AIADMK (Rs 55 Lacs) and to RJD (Rs 33 lacs) between FY 2003-04 and FY 2010-11.

Similar to the National Parties General Electoral Trust and Videocon Industries are other major donors for the Regional Parties. However, compared to the National Parties, individual donations form a major part of the overall income of the Regional Parties[1].

Thus, the Political Parties depend heavily on funds received by way of donations from various sources. Germany was the first country to start this practice of donating money to political parties. India soon followed the suit with big corporate houses such as Tatas and Birlas. Several reports published over time establish a relationship between the donations to Political Parties and corruption. In the light of the recent coal scam, as per the Comptroller and Auditor General of India, Tata Power is one of the major beneficiaries and it was also one of the major donors to political parties during that period, donating Rs 9.79 crore through its Electoral Trust. The Congress was given Rs 5.64 crore while the BJP got Rs 4.14 crore.

Samachar.com on August 28, 2012 reported that Anil Bhariwal, the convenor of the National Election Watch, says that they have found that many companies and large corporations have been funding political parties irrespective of which party is in power. "We feel that only smaller contributions are shown on paper while the bigger amounts are not declared. I am not sure what we can draw out of this. One needs to look into this and also find out whether these contributions are leading to any favours," says Bhariwal.

The first time the National Election Watch sought details of political donations, both the Congress and the Communist Party of India-Marxist stated that they were not public authorities defined under the Right to Information Act and hence were not compelled to reveal the details. The Nationalist Congress Party on the other hand told them it did not have people to compile data, while the BharatiyaJanata party and the Bahujan Samaj Party failed to respond to the request, which prompted them to approach the Chief Information Commissioner and argue their case.

Thus, whatever be the reason of the contribution by corporations whether a generous attempt or a scheme for being in the good books of political parties, one thing is the fact that such contributions have increased tremendously over the period. However, there is another aspect to the problem that is, the money that remains unaccounted for in the books of account.

Section 29C of the Representation of People Act, 1951 requires the political parties to submit the details of the contributions received in excess of Rs 20,000 from any person or a company. The provision means that all the contributions received over and above Rs. 20,000 whether as a single donation or as multiple donations should be reported. But it is often interpreted by the parties to report only the single donation exceeding Rs. 20,000 received at one time.

The problem is further aggravated by the "Coupon System" which is widely used by the political parties these days. Under this system, the political parties collect the funds from the donors in cash and in return, they are issued coupons in lieu of receipts. Since such donations are received in cash, it becomes difficult to establish the identity of the donor and thus such cash donations remain unaccounted for in the books because only those transactions are generally recorded for which some voucher in the form of receipt are issued.

In such situations where the corruption is at its peak, the procedures are complex and disclosures are inadequate, the increase, as per Companies Bill, 2012, in the legitimate contribution to political parties is a progressive step or the regressive one is to be seen. However, the increase from 5% to 7.5% has largely been criticized.

In a letter to the Hon'ble President of India dated August 08, 2013, the day when the Companies Bill was passed by Rajya Sabha, Sh. Gopal Krishna of Citizens Forum for Civil Liberties (CFCL) expressed concerns over the issue. He contends that this clause will work against the State funding of Elections and the prevention of menace of black money since corporate funding of election is the major root for various corporate crimes in the country such as impunity, environmental destruction, food poisoning and human rights violation. A supporter of the State Funding of the political parties and reducing their dependence on non-state actors, he made an appeal to the President saying that so long as these actors will continue to shape the outcome, democracy cannot be a winner as the deformed political system is turning legislature into a forum for legalized bribery. The way out could be to recommend that these very corporate donations be pooled into an electoral fund which can be used for state funding of elections. Therefore the provision for corporate funding of political parties be removed from the Companies Bill, 2012 and substituted by the provision of the state funding for political parties[2].

CONCLUSION AND RECOMMENDATIONS

Political Parties are indeed a necessity for any democratic society. India has 6 National Parties and 46 recognized State Parties. They represent the people and work for their interest by providing a vision and developing and adopting the suitable strategies and policy actions. For carrying out these tasks effectively, they need sufficient funds to meet the huge amount of expenses on election campaigns and the daily routine functions. More than the regulation required on the amount of funds, the need is to place a check on the way these funds are raised by the political parties. An immediate remedy would be a check and control on the corporate funding of political parties to prevent abuse and undue influence on political parties by the large business conglomerates and wealthy industrialists.

Thus, a limit on contributions and donations might work in restoring the confidence of general public in various political parties. A check on such undesirable funding will also help in saving the huge amount of country's resources and funds that are exuberantly spent by the political parties during elections. Equally important is the disclosure and transparency of such donations by both the companies and the political parties. There is no denying to the fact that largely such donations remain anonymous because of over Rs. 20,000 disclosure requirement and the coupon system. Mostly, the public is unaware of who contributed how much and to whom. Voters must have sufficient and timely information about the credibility of the political parties for making an informed decision. Therefore, Mr. S.Y. Quraishi, Chief Election Commissioner (CEC) also advocated the transparency in the corporate financing of political parties. According to him, payments should be made by cheques and there should be proper audit of these transactions. Audit reports should be put up online.Such donations should be disclosed to the Election Commission of India, the Income Tax Department and the public, he added further[3].

However, though the limit on political contribution has been increased from 5% to 7.5% in the Companies Bill, the new company legislation does promise to ensure greater transparency by requiring the companies to disclose such donations and contributions to the shareholders and other stakeholders. Contravention of these provisions shall invite hefty fine and penalty.How effective such provisions are, remains to be seen. Their actual effect can only be determined on their implementation. Till then, India awaits the signing of bill by the President and its enactment into law.

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2 Letter available for open access with the subject "Companies Bill facilitates corporate funding for political parties and co-option of NGOs" online at http://www.toxicswatch.org/2013/08/companies-bill-facilitates-corporate.html

3 Press Release dated June 17, 2011 by All India Association of Industries. Available online at http://www.aiaiindia.com/PressRelease/RealPress/qurasi.pdf

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SIGFREE WITH EXTENDED INSTRUCTION SEQUENCE GRAPH FOR DATA FLOW ANOMALY AND PROXY

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ABSTRACT

I propose SigFree an online signature-free out of box application layer method for blocking code injection buffer overflow attack messages targeting at various internet services such as web service. Motivated by the observation that buffer overflow attacks typically contain executables where as ligimate client requests never contain executables in most internet services, SigFree blocks attacks by detecting the presence of code. Unlike the previous code detection algorithms, SigFree uses a new data flow analysis technique called code abstraction that is generic, fast and hard for exploit code evade. SigFree is signature free, thus it can block new and unknown buffer overflow attacks. SigFree is also immunized from most attack side code obfuscation methods. Since SigFree is a transparent deployment to the servers being protected, it is good for economical Internet wide deployment with very low deployment and maintenance cost .I implemented and tested SigFree our experimental study shows that the dependency degree based SigFree could block all types of code injection attack packets (above 750) tested in our experiments with very few false positives. Moreover, SigFree causes very small extra latency to normal client requests when some requests contain exploit code

KEYWORDS

Buffer Overflow, Code Abstraction, Data flow anomaly & proxy and SigFree.

INTRODUCTION

Throughout the history of cyber security, buffer overflow is one of the most serious vulnerabilities in computer systems. Buffer overflow vulnerability is a root cause for most of the cyber attacks such as server breaking in, worms, zombies and botnets . A buffer overflow occurs during program execution when a fixed size buffer has had too much data copied into it. This causes the data to overwrite into adjacent memory locations and depending on what is stored there, the behavior of the program itself might be affected. Although taking a broader viewpoint, buffer overflow attacks do not always carry binary code in the attacking requests or packets code injection buffer overflow such as stack smashing probably count for most of the buffer overflow attacks that have happened in the real world.

Although tons of research has been done to tackle buffer overflow attacks, existing defenses are still quite limited in meeting four highly desired requirements (R1) Simplicity in maintenance; (R2) transparency t existing (legacy) server OS, application software and hardware; (R3) resiliency to obfuscation; (R4) economical Internet wide deployment. As a result, although several very secure solutions have been proposed, they are not pervasively deployed and a considerable number of buffer overflow attacks continue to succeed on a daily basis

To see how existing defenses are limited in meeting these four requirements, let us break down the existing buffer overflow defenses into six classes, which we will review shortly. Finding bugs in source code. (1b)Compiler extensions, (1c) OS modifications, (1d) Hardware modifications, (1e) Defense side obfuscation, (1f) Capturing code running symptoms of buffer overflow attacks.

Accordingly, SigFree works as follow: SigFree is an application layer blocker that typically stays between a service and the corresponding firewall. When a service requesting message arrives at SigFree, SigFree first uses a new O(N) algorithm, where N is the byte length of the message, to disassemble and distill all possible instruction sequences from the messages payload, where every byte in the payload is considered as a possible starting point of the code embedded(if any) . However, in this phase, some data bytes may be mistakenly decoded as instructions. In phase 2 , SigFree uses a novel technique called code abstraction. Code abstraction first uses data flow anomaly to prune useless instructions in an instruction sequence, then compares the number of useful instructions(scheme2) or dependence degree(scheme 3) to a threshold to determine if this instruction sequence contains code. Unlike the existing code detection algorithms that are based on signatures, rules or control flow detection, SigFree is generic and hard for exploit code to evade.

The merits of SigFree are summarized as ,SigFree is Signature Free, thus it can block new and unknown buffer overflow attacks.Without relying on string machining, SigFree is immunized from most attack side obfuscation methods.SigFree uses generic code data separation criteria instead of limited rules. This feature separates SigFree from it, an independent work that tries to detect code embedded packets Transparency. SigFree is an out of the box solution that requires no server side changes. SigFree is an economical deployment with very low maintenance cost, which can be well justified by aforementioned features.

REVIEW OF LITERATURE

COUNTING CODE INJECTION ATTACKS WITH INSTRUCTION SET RANDOMIZATION

I describe a new general approach for safeguarding systems against any type of code injection attack.I apply Kirchhoff's principle, by creating process specific randomized instruction sets of the system executing potentially vulnerable software. An attacker who does not know the key to the randomization algorithm will inject code that is invalid for that randomized processor, causing a runtime exception. To determine the difficulty of integrating support for the proposed mechanism in the OS,i modified the Linux kernel, the GNU binutils tools and the bochs-x86 emulator. Although the performance penalty is significant, this prototype demonstrates the feasibility of the approach and should be directly useable on a suitable modified processor.My approach is equally applicable against code injecting attacks in scripting and interpreted languages. The performance penalty in this case is minimal. Where my proposed approach is feasible, it can serve as a low overhead protection mechanism and can easily complement other mechanisms.

EFFICIENT TECHNIQUES FOR COMPREHENSIVE PROTECTION FROM MEMORY ERROR EXPLOITS

Despite the wide publicity received by buffer overflow attacks, the vast majority of today's security vulnerabilities continue to be caused by memory errors, with a significant shift away from stack smashing exploits to newer attacks such as heap overflows, integer overflows and format string attackers. While comprehensive solutions have been developed to handle memory errors, these solutions suffer from one or more of the following problems: high overheads (often exceeds 100%) , incompatibility with legacy C code and changes to the memory model to use garbage collection. Address space randomization (ASR) is a technique that avoids these drawbacks, but existing techniques for ASR do not offer a level of protection comparable to the above techniques.

PACKET VACCINE: BLACK BOX EXPLOIT DETECTION AND SIGNATURE GENERATION

In biblogy, a vaccine is a weakened strain of a virus or bacterium that is intentionally injected into the body for purpose of stimulating antibody production. Inspired by this idea, we propose a packet vaccine mechanism that randomizes address like strings in packets payloads to carry out fast exploit detection, vulnerability diagnosis and signature generation. An exploit with a randomized jump address behaves like a vaccine: it will likely cause an exception in a vulnerable program's process when attempting to hijack the **control-ow** and there by expose itself. Taking that exploit as a template, our signature generator creates a set of new vaccines to probe the program, in an attempt to uncover the necessary conditions for the exploit to happen.

STATIC ANALYSIS OF EXECUTABLES TO DETECT MALICIOUS PATTERNS

Malicious code detection is a crucial component of any defense mechanism. In this paper, i present a unique view point on malicious code detection.I regard malicious code detection as an obfuscation de-obfuscation game between malicious code writers and researchers working on malicious code detectors, such as

anti virus software.I tested the resilience of three commercial virus scanners against code obfuscation attacks. The results were surprising: the three commercial virus scanners could be subverted by very simple obfuscation transformation.I present an architecture for detecting malicious patterns in executables that is resilient to common obfuscation transformations.

OBFUSCATION OF EXECUTABLE CODE TO IMPROVE RESISTANCE TO STATIC DISASSEMBLY

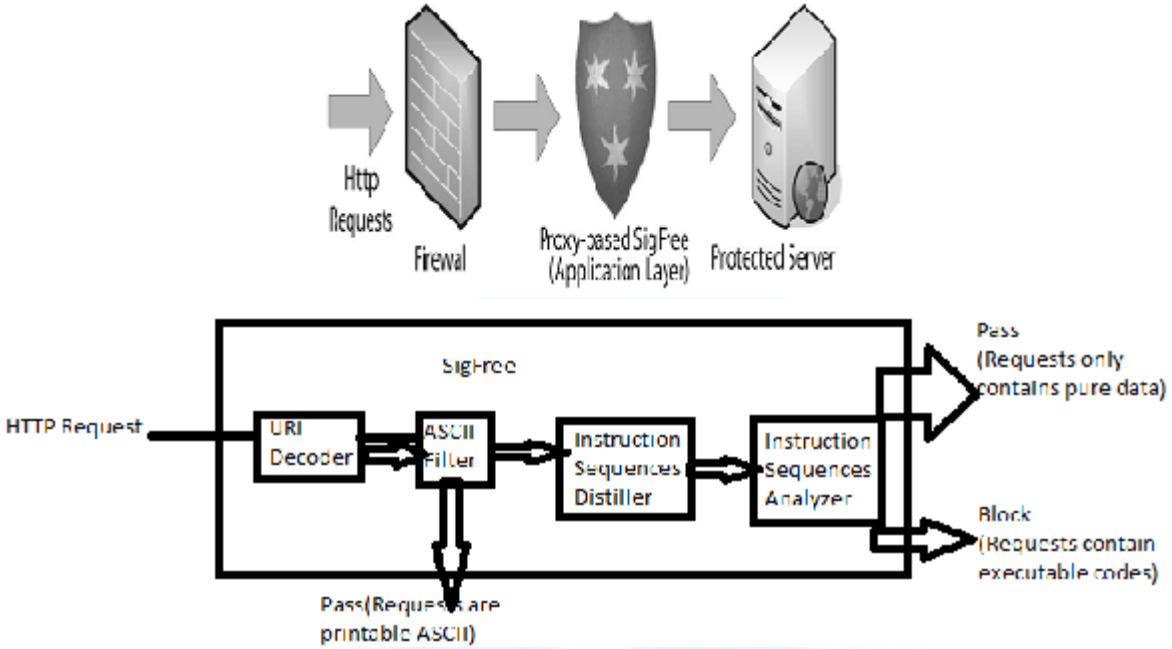
A great deal of software is distributed in the form of executable code. The ability to reverse engineer such executables can create opportunities for theft of intellectual; property via software piracy, as well as security breaches by allowing attackers to discover vulnerabilities in an application. The process of reverse engineering an executable program typically begins with disassembly, which translates machine code to assembly code. This is then followed by various recompilation steps that aim to recover higher level abstractions from assembly code. Experimental results indicate that significant portions of executables that have been obfuscated using techniques are disassembled in correctly, there by showing the efficacy of our methods.

IMPORTANCE OF THE STUDY

SigFree, an online signature free out of the box application layer method for blocking code injection buffer overflow attack messages targeting at various Internet services such as web service. Motivated by the observation that buffer overflow attacks typically contain executables where as legitimate client requests never contain executables in most Internet services, SigFree blocks attacks by detecting the presence of code. Unlike the previous code detection algorithms, SigFree uses new data flow analysis technique called code abstraction that is generic, fast and for exploit code to evade. SigFree is significant free, thus it can block new and unknown buffer overflow attacks. SigFree is also immunized from most attack side code obfuscation methods. Since SigFree is a transparent deployment to the servers being protected, it is good for economical Internet wide deployment with very low deployment and maintenance cost

METHODOLOGIES

ARCHITECTURE DIAGRAM



RESEARCH METHODOLOGY

PREVENTION/DETECTION OF BUFFER OVERFLOWS

Existing prevention/detection techniques of buffer overflows can be roughly broken down into six classes:

CLASS 1A: Finding bugs in source code. Buffer overflows are fundamentally due to programming bugs. Accordingly, various bug finding tools have been developed. The bug finding techniques used in these tools, which in general belong to static analysis, include but are not limited to model checking and bugs as deviant behavior .Class 1a technique are designed to handle source code only and they do not ensure completeness in bug finding. In contrast, SigFree handles machine code embedded in a request (message)

CLASS 1B: Compiler extensions. If source code is available, a developer can add buffer overflow detection automatically to a program by using a modified compiler". Tree such compilers are StakGuard, ProPolice and Return Address Defender(RAD), DIRA is another compiler that can detect control hijacking attacks , identify the malicious input and repair the compromised program. Class 1B techniques require the availability of source code. In contrast, SigFree does not need to know any source code.

CLASS 1C: OS modifications. Modifying some aspects of OS may prevent buffer overflows such as PAX, LibSafe and e-NeXsh. Class 1C techniques need to modify the OS .In contrast, SigFree does not need any modification of the OS

CLASS 1D: Hardware Modifications. A main idea of hardware modification is to store all return addresses on the processor. In this way , no input can change any return address.

CLASS 1E: Defence side obfuscation. Address Space Layout Randomization (ASLR) is main component of PaX, Address space randomization, in its general form, can defect exploitation of all memory errors. Instruction set Randomization, can detect all code injection attacks, where as SigFree cannot guarantee detecting all injected code. Nevertheless, when these approaches detect an attack, the victim process is typically terminated. "Repeated attacks will require repeated and expensive application restarts effectively rendering the service unavailable".

CLASS 1F: Capturing code running symptoms of buffer overflow attacks. Fundamentally, buffers overflow area code running symptom. If such unique symptoms can be captured, all buffer overflows can be detected.Class 1B, Class 1C and Class 1E techniques can capture some but not all of the running symptoms of buffer overflows.

WORM DETECTION AND SIGNATURE GENERATION

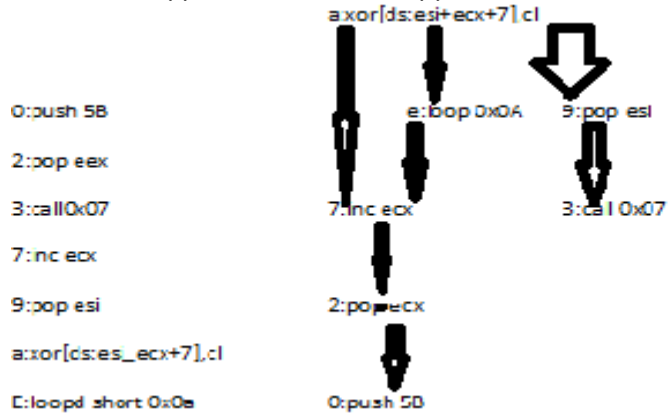
Because buffer overflow is a key target of worms when they propagate from one host to another, SigFree is related to worm detection. Based on the nature of worm infection symptoms, worm detection techniques can be broken down into 3 class [Class 2A] techniques use such macro symptoms as Internet background radiation to raise early warmings of Internet wide worm infection. [Class 2B] techniques use such local traffic symptoms as content invariance, content prevalence and address dispersion to generate worm signatures and/or block worms. [Class 2D] techniques use anomaly detection on packet payload to detect worms and generate. Wang and Stolfo first proposed Class 2D techniques called PAYL. PAYL is first trained with normal network flow traffic and then uses some byte level statistical measures to detect exploit code. Class 2B techniques are typically not very resilient to obfuscation. SigFree is immunized from most attack side obfuscation methods.

MACHINE CODE ANALYSIS FOR SECURITY PURPOSES

Although source code analysis has been extensively studied, in many real world scenarios, source code is not available and the ability to analyze binaries is desired. Machine code analysis has three main security purposes (P1) to malware detection, (P2) to analyze binaries and (P3) to identify and analyze the code contained in buffer overflow attack packets. The implementation of their approach is resilient to a number of code transformation techniques. Although their techniques also handle binary code, they perform offline analysis. SigFree is an online attack blocker.

Four rules are discussed in this paper: Case 1 not only assumes the occurrence of the call/jmp instructions but also expects that the push instruction appears before the branch; Case 2 relies on the interrupt instruction; Case 3 relies on instruction set; Case 4 exploits hidden branch instructions. Besides, they used a special rule to detect polymorphic exploit code that contains loop

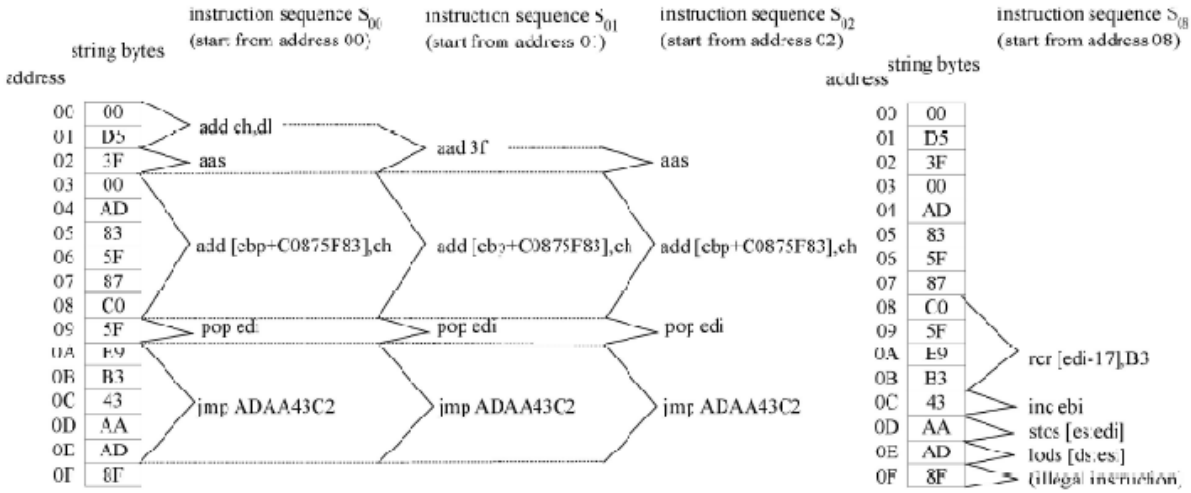
FIGURE 1: (a) A DECRYPTION ROUTINE (b) A DEF-USE GRAPH



INSTRUCTION SEQUENCE DISTILLER

This section first describes an effective algorithm to distill instruction sequences from requests, followed by several pruning techniques to reduce the processing overhead of instruction sequence analyzer

FIGURE 2: INSTRUCTION SEQUENCES DISTILLED



DISTILLING INSTRUCTION SEQUENCES

To distill an instruction sequence, first assign an address (staring from zero) to every byte of a request, where address is an identifier for each location in the request. Then I disassemble the request from a certain address until the end of request is reached or an illegal instruction opcode is encountered. There are two traditional disassembly algorithms: Linear sweep and recursive traversal. The linear sweep algorithm begins disassembly at a certain address and proceeds by decoding each encountered instruction. The recursive traversal algorithm also begins disassembly at a certain address, but it follows the control flow of instructions. In this paper,i employ the recursive traversal algorithm, because it can obtain the control flow information during the disassembly process. To get all possible instruction sequences from an N-byte request, we simply execute the disassembly algorithm N times and each time i start from a different address in the request. This gives us a set of instruction sequences. The running time of this algorithm is O(N)**.** One drawback of the above algorithm is that the same instructions are decoded many time, i design a memorization algorithm by using a data structure, which is an EIFG defined earlier, to represent the instruction sequences. To distill all possible instruction sequences from request is simply to create the EIFG for the request . An EIFG is used to represent all possible instruction in a request. To traverse an instruction sequence, we simply traverse the EIFG from the entry instruction of the instruction sequence and fetch the corresponding instructions from the instruction array . FIGURE 3 shows the data structure for the request shown in FIGURE 2. The details of the algorithm for creating the data structure are described in Algorithm 1. Clearly, the running time of this algorithm is O(N), which is optimal as each address is traversed any once.

ALGORITHM 1: Distill all Instruction sequences from a request initialize EISG G and instruction arrray A to empty
for each address *i* of the request **do**
add instruction node *i* to G
i ← the start address of the request
while *i* <= the end address of the request **do**
inst ← decode an instruction at *i*
if *inst* is illegal **then**
A[i] ← illegal instruction *inst*
Set type of node *i* "illegal node " in G
else
A[i] ← instruction *inst*
if *inst* is a control transfer instruction **then**

for *inst* is a control transfer instruction **do**
if target *t* is an external address **then**
add external address node *t* to G
add edge *e*(node *i*,node *t*) to G
else
add edge e(node *i*,node *i+inst.length*) to G
i←*i*+1

EXCLUDING INSTRUCTION SEQUENCES

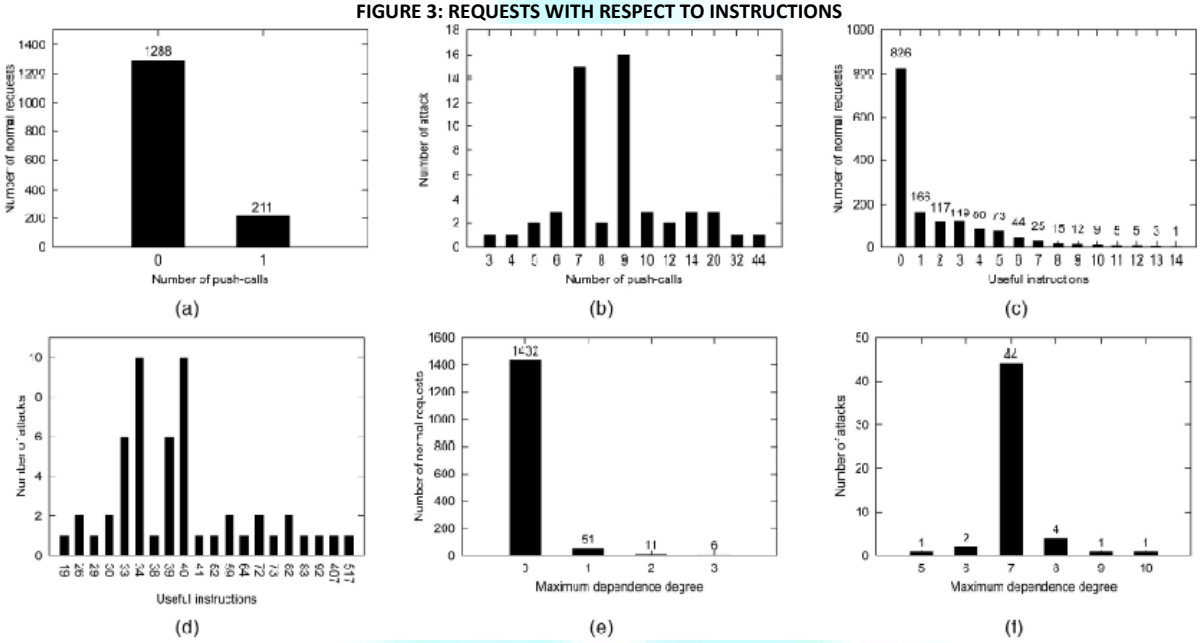
The previous step may output many instruction sequences at different entry points. Next, i exclude some of them based on several heuristics. Here, excluding an instruction sequences means that the entry of this sequence is not considered as the real entry for the embedded code. The fundamental rule in excluding instruction sequences is not to affect the decision whether a request contains code or not, this rule can be translated into the following technical requirements: if a request contains a fragment of a program, the fragment must be one of the remaining instruction sequence or a subsequence of a remaining instruction sequences or it differs from a remaining sequence only by few instructions.

STEP1: If instruction sequence s_a is a subsequence of instruction sequence s_b , we execute s_a . The rationale for excluding s_a is that if s_a satisfies some characteristics of programs, s_b also satisfies these characteristics with a high probability.

STEP2: If instruction sequence s_a merges to instruction sequence s_b after a few instructions and s_a is no longer than s_b, we exclude s_a. It is reasonable to expect that s_b will preserve s_a's characteristics. Many distilled instruction sequences are observed to merge other instruction sequences after a few instructions.

STEP 3: For instruction sequences, when they are executed, which ever execution path is taken, an illegal instruction is inevitably reacted. We say an instruction is inevitably reached if two conditions hold. One is that there are no cycles in EIFG of the instruction sequence; other is that there are no external address nodes in the EIFG of the instruction sequence.

FIGURE 3: REQUESTS WITH RESPECT TO INSTRUCTIONS



INSTRUCTION SEQUENCE ANALYZER

A distilled instruction sequence may be a sequence of random instructions or a fragment of a program in machine language.

SCHEME 1: A program machine language is dedicated to a specific OS; hence, a program has a certain characteristics implying the OS on which it is running, for example calls to OS or kernel library. A random instruction sequence does not carry this kind of characteristics. By identifying the call pattern in an instruction sequence, we can effectively differentiate a real program from a random instruction sequence. To address this issue, we use a pattern composed of several instruction used to transfer parameters.One possible obfuscation is that attackers may use other instruction is substituted to replace the "call" and "push" instructions. FIGURE 1 shows an example of obfuscation, where "call EAX" instruction is substituted by "push J4" and "jmp EAX". Although we cannot fully solve this problem, by recording this kind of instruction replacement patterns

SCHEME 2: Next, we use the detection of data flow anomaly in different way called code abstraction. We observe that when there are data flow anomalies in an execution path of an instruction sequence, some instructions are useless, where as in a real program at least one execution path has certain number of instructions. Data flow anomaly, the term data flow anomaly was originally used to analyze programs written in higher level languages in the software reliability and testing field. There are three data flow anomalies: define-define define-undefined and undefined reference. The define-define anomaly means that a variable was defined and is defined again, but it has never been referenced between these two actions. The undefined refence anomaly indicates that a variable was undefined receives a reference action. The defined-undefined anomaly means that a variable was defined and before it is used as undefined. Figure 1 shows an example

DETECTION OF DATA FLOW ANOMALY

There are static or dynamic methods to detect data flow anomalies in the software reliability and testing field. Static methods are not suitable in our case due to its slow speed; dynamic methods are not suitable either due to the need for real execution of a program with some inputs. As such, we propose a new method called code abstraction, which does not require real execution of code. As a result of the code abstraction of an instruction, a variable could be in one of the six possible states. The six possible states are state U: undefined, state D: defined but not reference; and state DU: abnormal state defines- undefined. FIGURE 6 depicts the state diagram of these states. Each edge in this state diagram is associated with d, r, or u which represents "define", "reference", and "undefined" respectively.I assume that a variable is in "undefined" state at the beginning of an execution path. Now,i start to traverse this execution path. If the entry instruction of the execution path defines this variable, it will enter the state "defined". Then, it will enter another state according to the next instruction, as we shown in FIGURE 6. Once the variable enters an abnormal state, a data flow anomaly is detected. I continue this traversal to the end of the execution path. ALGORITHM 2 shows algorithm to check if the number of useful instructions in an execution path exceeds a threshold. The algorithm involves a search over an EISG in which the nodes are visited in a specific order derived from a depth first search. The algorithm assumes that an EISG G and the entry instruction of the instruction sequence are given and push down stack is available for storage. During the search process, the visited nodes is abstractly executed to update the states of variables , find data flow anomaly and prune useless instructions in an execution path.

ALGORITHM 2 check if the number of useful instruction in an execution path exceeds a threshold

INPUT: *entry* instruction of an instruction sequence, EISG G

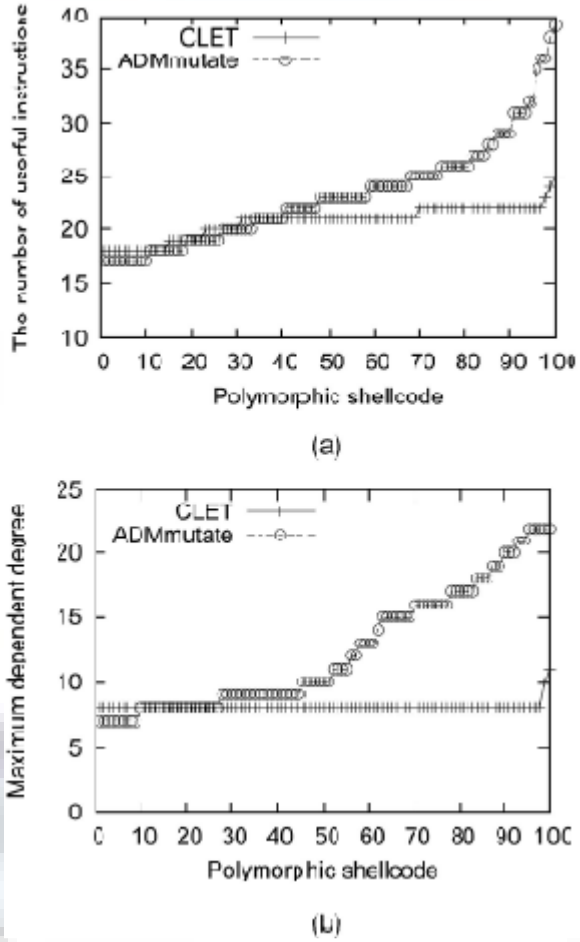
total← *0; useless*←*0;stack*←empty

```
  initialize the states of all variables to "undefined"
  push the empty instruction, states,total and useless to stack
 while stack is not empty do
   pop the top item of stack to i, states,total and useless
   if total←useless greater than a threshold   then
    return  true
  if i is visited then
    continue (passes control to the next iteration of the WHILE loop)
    mark i visited
    total←total+1
    Abstractly execute instruction i
    if  there is a define-define or define-undefine anomaly then
      useless←useless+1
   if  there is an undefine-reference anomaly then
     useless←useless+1
 for each instruction j directly following i in the G  do
    push j,states,total and useless to stack
return  false
```

HANDLING SPECIAL CASES

Next, i discuss several special cases in the implementation of scheme 2. General purpose instruction. The instructions in the IA-32 instruction set can be roughly divided into four groups: General purpose instructions, floating point unit instructions, extension instructions and system instructions. General purpose instructions are also the most often used instructions in malicious code. I believe that malicious codes must contain number of general purpose instructions to achieve the attacking goals. Other types of instructions may be leveraged by an attacker to obfuscate his real purpose code, e.g. used as garbage in garbage insertion. As such, we consider other groups of instructions as useless instructions.

FIGURE 4: POLYMORPHIC SHELL CODE DEPENDS ON INSTRUCTIONS DEGREE



INITIAL STATE OF REGISTERS

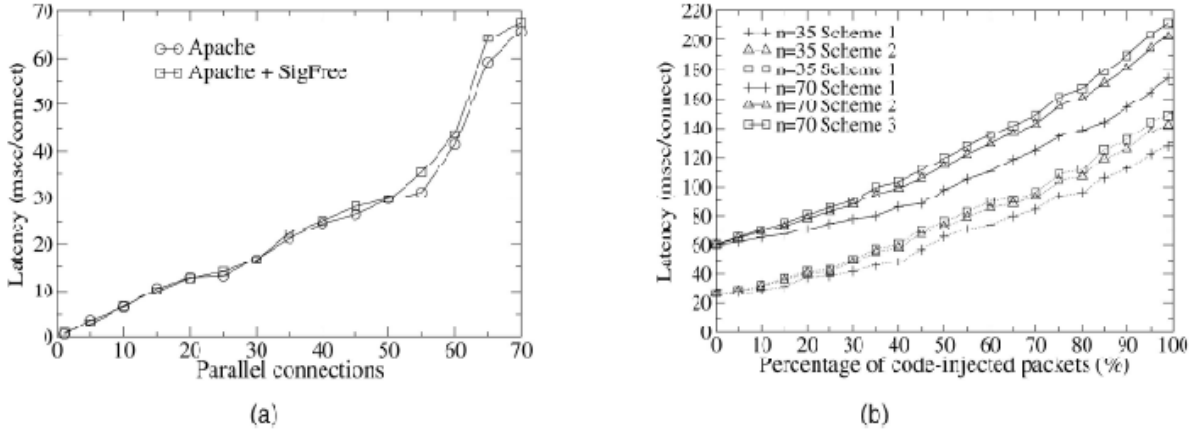
For registers, we get their initial states to "undefined" at the beginning of an execution path. The register "ESP", however, is an exception since it is used to hold the stack pointer. Thus, we set register ESP "defined" at the beginning of an execution path indirect address. An indirect address is an address that serves as a reference point instead of an address to the direct memory location.Thus, we always treat a memory location to which an indirect address points as state "defined" and hence no data flow anomaly will be generated. Indeed, this treatment successfully prevents an attacker from obfuscating his code using indirect addresses. Useless control transfer instructions (CTIs). Condition instructions Jcc(jump on condition code cc) and LOOPcc use one or more of the status flags as condition codes and test them for branch or end loop conditions. During a program execution at runtime, an instruction may affect a status flag on three different ways: set, unset, undefined. We consider both set and unset are defined in code abstraction.

SCHEME 3: I propose SCHEME 3 for detecting the aforementioned specially crafted code. Scheme 3 also exploits code abstraction to prune useless instructions in an instruction sequence. Unlike SCHEME 2, which compares the number of useful instructions with a threshold, SCHEME 3 first calculates the dependent degree of every instruction in the instruction sequence. If the dependence degree of any useful instructions in an instruction sequence exceeds a threshold, i conclude that the instruction sequence is a segment of a program. Dependency is a binary relation over instructions in an instruction sequence.

STAND ALONE SIGFREE

Implemented a stand alone SigFree prototype using the C programming language in the Win32 environment. The stand alone prototype was compiled with Borland C++ version 5.5.1 at optimization level 02. The experiments were performed in Windows 2003 server with Intel Pentium 4, 3.2 GHz CPU and 1 GByte memory. I measured the processing time of the stand alone prototype over all 0-10 Kbytes images collected from the above real traces. I set the upper limit to 10 Kbytes because the size of a normal web request is rarely over that if it accepts binary inputs. The types of the images include JPEG, GIF, PNG and X-ICON. FIGURE 5 shows that the average processing time of the three schemes increases linearly when the sizes of the image files increase. It also shows that SCHEME 1 is the fastest among the three schemes and SCHEME 3 is a little bit slower than SCHEME 2. In all three Schemes, the processing time over a binary file of 10 Kbytes is no more than 85ms.

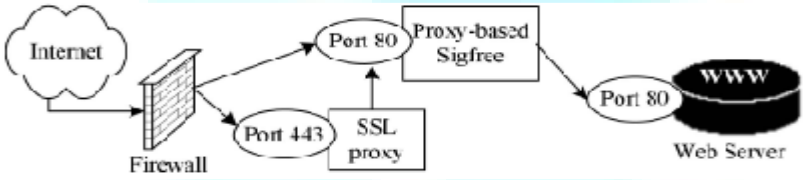
FIGURE 5:PERFORMANCE IMPACT OF SIGFREE ON APACHE HTTP SERVER



PROXY BASED SIGFREE

To evaluate the performance impact of SigFree to web servers,i also implemented a proxy based SigFree prototype. FIGURE 6 depicts the implementation architecture. It is comprised of the following modules *URI decoder*- the specification for URLs limits the allowed characters in a Request- URI to only a subset of the ASCII character set. This means that the query parameters of a request –URI beyond this subset should be encoded. Because a malicious payload may be embedded in the request-URI as a request parameter, the first step of SigFree is to decode the request-URI.*ASCII filter,* malicious executable codes are normally binary strings. In order to guarantee the throughput and response time of the protected web systems, if a request is printable ASCII ranging from 20 to 7E hex, SigFree allows the request to pass. Note that ASCII filter does not prevent the service from receiving non-ASCII strings. All non-ASCII strings will analyzed by ISD and ISA. The proxy based prototype was also compiled with Borland C++ version 5.5.1 at optimization level O2. The proxy based prototype implementation was hosted in the windows 2003 server with Intel Pentium 4, 3.2 GHz CPU and 1-GByte memory.

FIGURE 6: SIGFREE WITH AN SSL PROXY



RESULTS

DATABASE TABLES

FIGURE 7: ADMIN TABLE

	TABLE_QUALIFIER	TABLE_OWNER	TABLE_NAME	TABLE_TYPE	REMARKS
18	sigfree	dbo	systypes	SYSTEM TABLE	NULL
19	sigfree	dbo	sysusers	SYSTEM TABLE	NULL
20	sigfree	dbo	dtproperties	TABLE	NULL
21	sigfree	dbo	Username	TABLE	NULL
22	sigfree	dbo	sysconstraints	VIEW	NULL
23	sigfree	dbo	syssegments	VIEW	NULL

FIGURE 8:USER DATABASE TABLE

	FirstName	password	confirm	username	city	state	emailid
1	vivek	123455	123456	vivek	chennai	tamil nadu	vivek@gmail.com
2	null	null	null	null	null	null	null
3	obarai	123455	123456	obarai	chia	ffxgk	oba@gmail.com
4	veera	badra1234	badra1234	veera	Hyderabad	AP	veerabadra@gmail.com
5	anitha	anitha	anitha	anitha	Vijayawada	AP	veera@gmail.com
6	teja	123455	123456	teja	chennai	tamil nadu	teja143@gmail.com
7	Mahesh	mahesh	mahesh	mahesh	tirupati	AP	mahesh@gmail.com
8	seshu	seshu1	seshu1	seshu	bvrm	ap	seshu@gmail.com
9	vamshi	vamshi	vamshi	vamshi	hyderabad	AP	vamshi@gmail.com

FIGURE 9: CLIENT SIDE

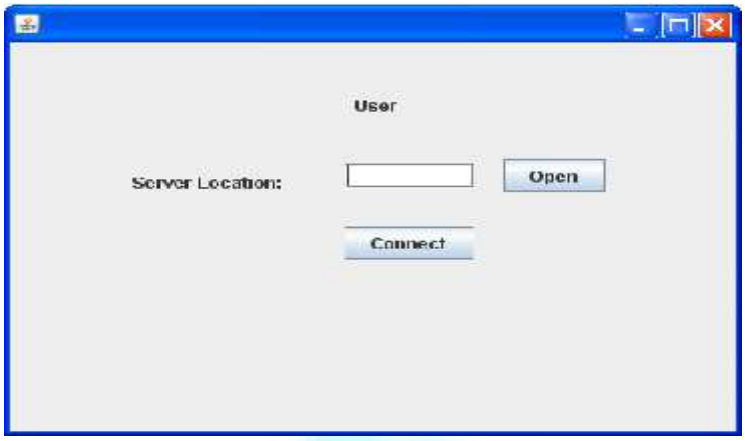


FIGURE 10 : CLIENT PROGRAM

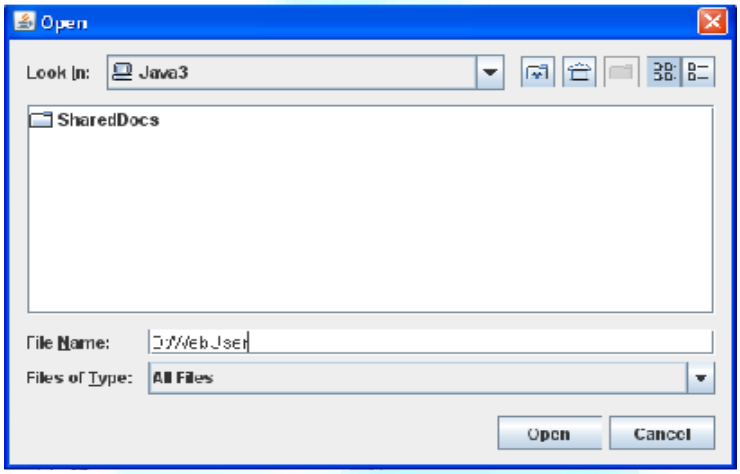


FIGURE 11: SIGFREE APPLICATION LOGIN PAGE

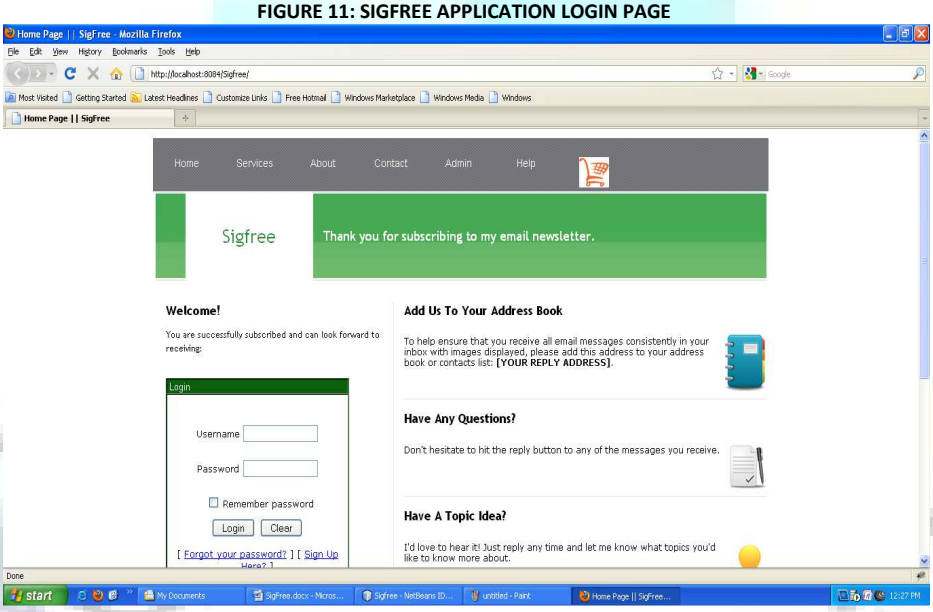


FIGURE 12: HACKER SENDS THE ADDS

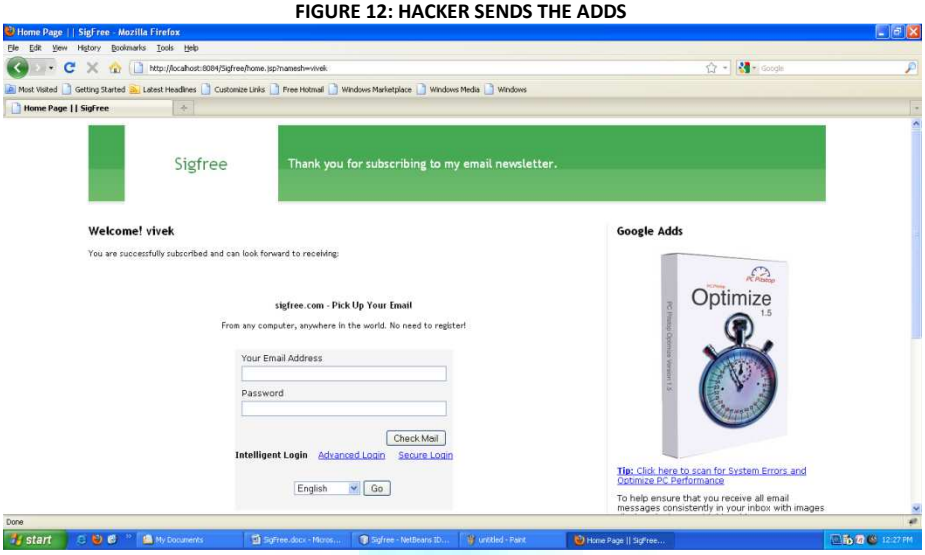


FIGURE 13: USER CLICKS ON ADD

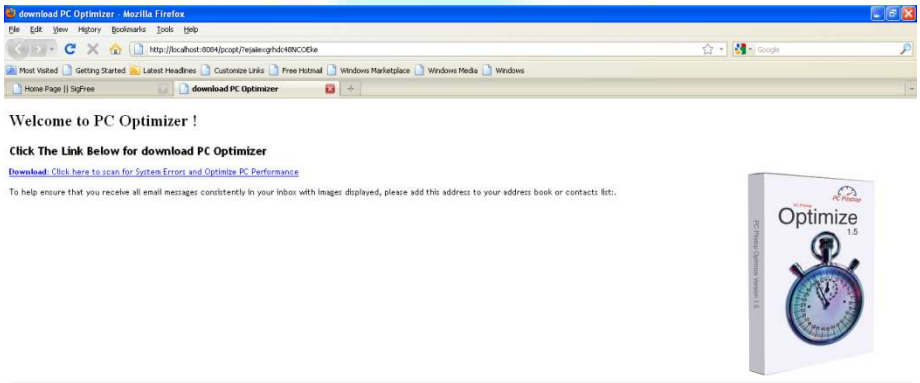
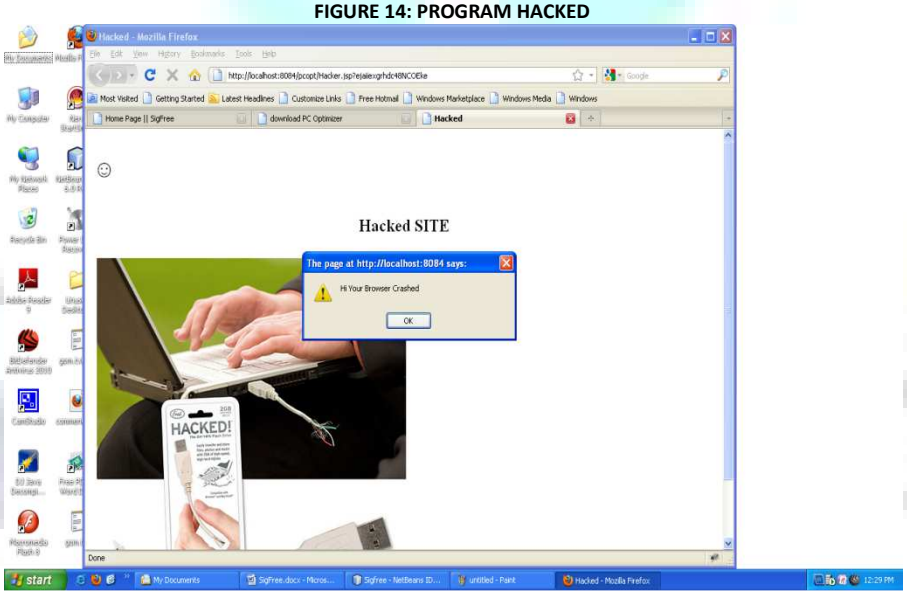


FIGURE 14: PROGRAM HACKED



ADMIN

FIGURE 15: ADMIN LOGIN PAGE

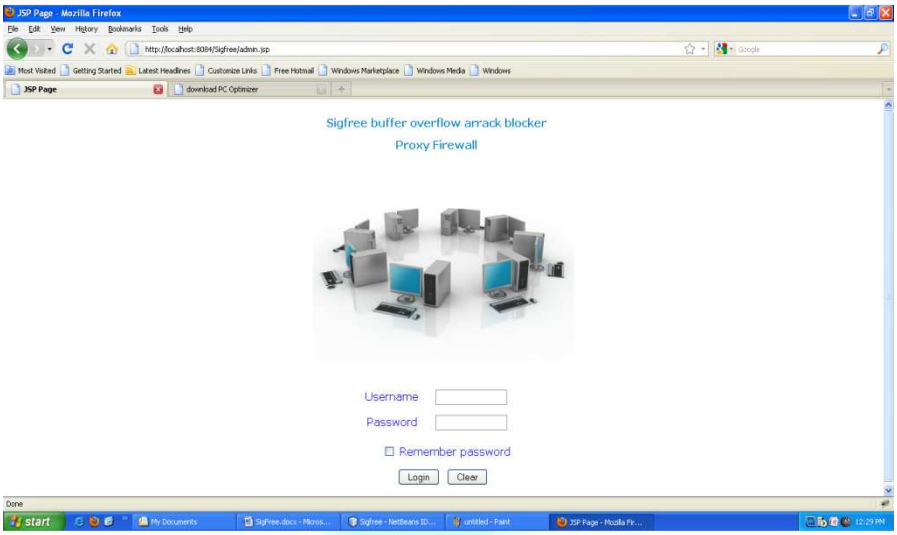


FIGURE 16: CLUSTER VIEW

FIGURE 17: AFTER SELECTING CLUSTER1

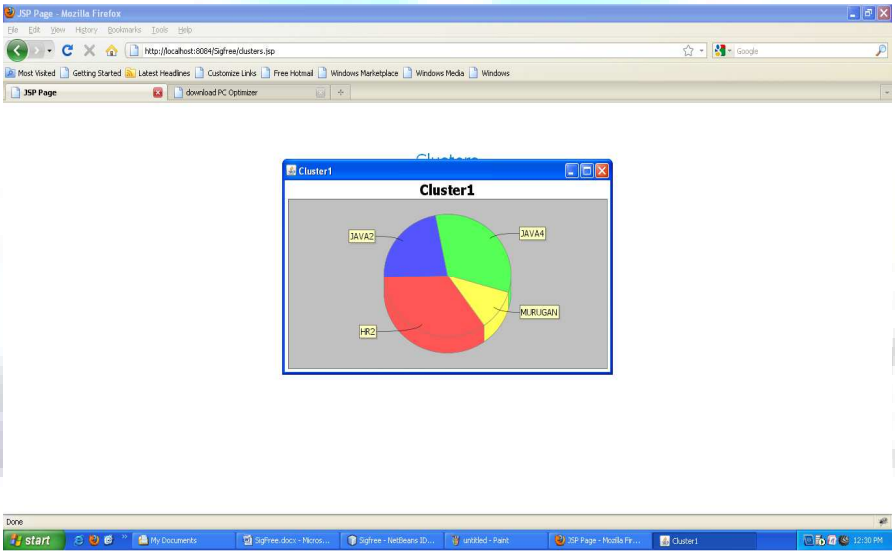


FIGURE 18: USER'S VIEW

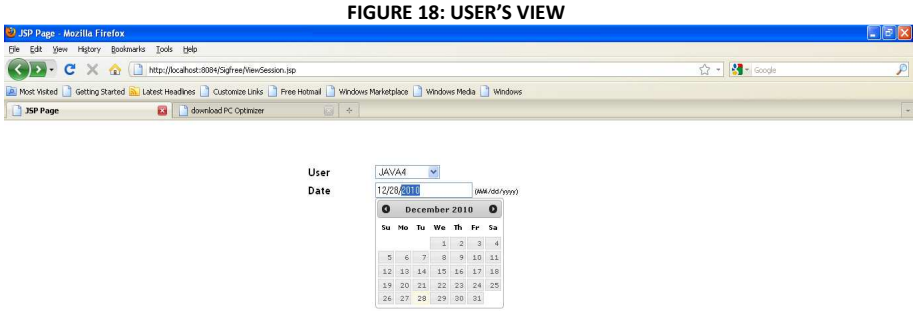
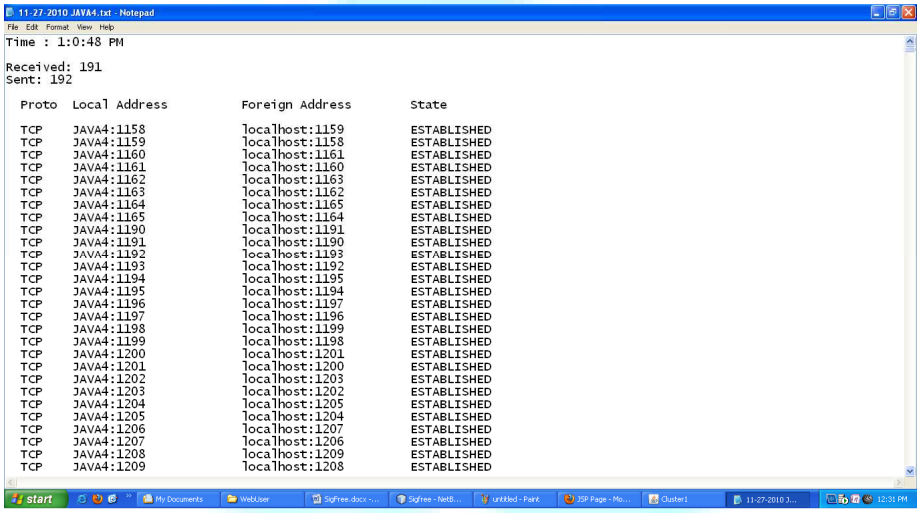


FIGURE 19: CONNECTIONS ESTABLISHED



CONCLUSION

A great deal of software is distributed in the form of executable code. Such code is potentially vulnerable to reverse engineering, in the form of disassembly followed by recompilation. This can allow an attacker to discover vulnerabilities in the software modify it in unauthorized ways or steal intellectual property via software privacy. This paper describes and evaluates techniques to make executable programs harder to disassemble. Our techniques are seen to be quite effective applied to the widely used SPECint-95 benchmark suite, they result in disassemble over 65%of the instructions and 85% of the functions in the obfuscated binaries. We SigFree does not require any Signatures, it can block new unknown attacks. It is immunized from most attack side code obfuscation methods and good for economical Internet wide deployment with little maintenance cost

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A STUDY ON CHALLENGES OF INDIAN HOSPITALITY INDUSTRY AND REMEDIES FOR SUSTAINABILITY IN THE EVER CHANGING MARKET SCENARIO

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ABSTRACT

Hospitality industry is poised for a steep growth over a long term period. This is mostly attributed to increase in domestic travel and high disposable income. The aviation industry, which directly impacts the hospitality industry has started to open up and will continue to grow over the years. Budget /Bed and Breakfast hotels are preferred by middle income groups and their business will grow with schemes/ price reductions offered by budget airways. National and international social travel sites have also brought about a transparency to the hospitality industry. They have increased the accessibility of hotels while providing information about lesser known places. All in all, there are many positives for the hospitality industry to look forward to in the coming years. However, there are many factors which are hampering the rate at which the industry could be growing. Some, the hotels can control and some need inputs from the government. The purpose of this study is to highlight the main challenges faced by the hospitality industry, envision a change and explore solutions for sustainability in the ever-changing market scenario. Sustainable development, customer relationship management, skilled staff shortage, employment turnover and talent retention, security and digital marketing have emerged as the major challenges. It is important for stakeholders of hospitality industry to consider these challenges in a dynamic market situation and counter them by adopting appropriate changes recommended.

KEYWORDS

Customer Relation Management, Hospitality Industry Challenges, Social Media and Tourism Industry, Sustainability.

INTRODUCTION

The hospitality industry is considered the world's fastest growing industry contributing for nearly 10% of the world's GDP (Boella, 2000). In recent years, hospitality Industry in India has seen a remarkable boom, propelled by the growth of Indian Tourism Industry. It has assumed a vital place in almost all businesses covering a diverse range of establishments in the form of accommodation, food and drinks thus encompassing hotels, motels, restaurants, bars, ships, airlines and railways. The industry is witnessing higher growth with the explosion of travel and tourism leading to several international hotels establishing themselves in India, with many eying for greater space. The arrival of foreign tourists has shown a compounded annual growth of 6 per cent over the past 10 years, placing travel and tourism as the second highest foreign exchange earner for India. Moreover, it is also estimated that the tourism sector will account for nearly 5.3 per cent of GDP and 5.4 per cent of total employment.

REVIEW OF LITERATURE

WORLD ECONOMY: With globalization, the Indian economy is integrated with the world economy wherein liberalization and privatization is the order of the day. Business models will have to measure up to the standards set by the leaders in the respective fields, anywhere in the world. The Indian industry which was until now working in a protected environment is exposed to global competition. Organizations are reacting to this phenomenon by resorting to restructuring and re-engineering, leading to cost cutting and competitiveness. Since the crash of the world economy, hospitality industry is faced with challenges with reduced demand and diminished returns leading to a squeezed budget.

ECONOMIC GROWTH: India is one of the fastest growing economies in the world recording a strong growth in the past few years, at more than 9% each during FY06 - FY08. Despite the global economic slowdown, the Indian economy clocked growth of 6.7%, 7.4% and 8.5% in FY09, FY10 and FY 11 respectively. Though hospitality industry contributed only 2% of the GDP in 2003-04, it is projected to grow at 8.8% from 2007-16, which would place India as the second-fastest growing tourism market in the world. Foreign investors are evincing interest in establishing operational facilities in India competing with the heavy investments made by domestic industries for expanding their facilities through greenfield and brownfield projects.

AVIATION INDUSTRY AND THE HOTEL INDUSTRY: There is a direct relation between the aviation industry and the hospitality industry. The growth of the aviation industry directly contributes to the development of the hospitality industry. As our aviation sector grows, more and more tourists, business professionals and seasoned travellers find their way into our country through bigger airports like Mumbai, Hyderabad, Delhi and Bangalore and eventually into smaller ones like Bagdogra, Port Blair, Srinagar etc., thereby augmenting opportunities of hospitality industry.

TOURISM INDUSTRY AND HOTEL INDUSTRY: Growth of hospitality and tourism industry depend on common factors. However growth of hospitality industry heavily relies on tourism industry and hence tourism is one of the most important growth drivers. According to the latest Tourism Satellite Accounting (TSA) research, released by the World Travel and Tourism Council (WTTC), the demand for travel and tourism in India expected to grow by 8.2 % between 2010 and 2019 will place India in the third place and make it the second largest employer in the world. The report forecasts India to get more capital investment in travel and tourism sector thereby projecting it to become the fifth fastest growing business travel destination from 2010 through 2020. In the annual budget 2012-13 allocation for tourism sector saw an increase of 9.5 per cent over the previous year. Rs.548 crore is earmarked for creating new infrastructural facilities like constructing budget accommodations, wayside amenities, tourist reception centres, refurbishment and illumination of monuments, adventure and sports facilities and Rs.348.20 crore is earmarked for the 'Incredible India' campaign, which showcases India's major holiday destinations . To promote domestic tourists, the annual budget 2012-13 has allocated Rs. 81 crore, a hike from last year's Rs. 67.75 crore. All these measures augur well for the Indian hospitality industry.

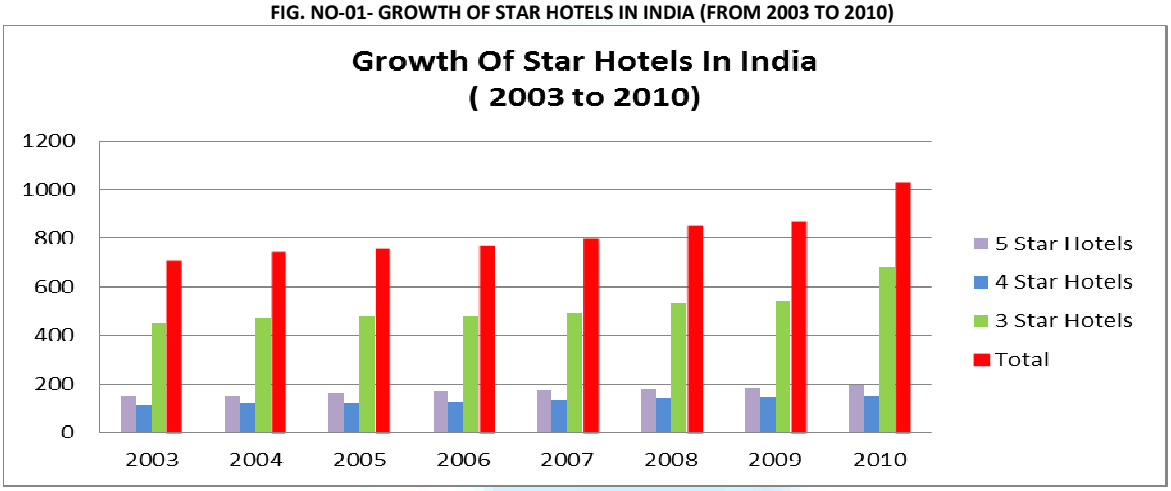
GROWTH OF HOSPITALITY INDUSTRY: The hospitality industry recorded strong growth in early 2000, translating it to a rise in occupancy rate during 2005/06 and 2006/07. The average rates for hotel rooms also increased in 2006/07 due to the demand-supply gap for hotel rooms, mainly in major metros. Hotels charged higher, compared to global rates which lured domestic and international players into hospitality industry, making India one of the most attractive destinations for such investments. Sharp rise in rates translated into cost-effective lodging options leading to emergence of corporate guest houses in major metros, and leased apartments as replacements for hotels. Though average room rates rose in 2007/08, occupancy rates slowly dropped reaching its lowest ebb during 2009-10. With the rise of domestic tourists, later part of 2010 showed improvement with increased occupancy and lower average room rates. During a survey, collected data of eight years (2003-2010) indicated steady growth of star hotels during the period. Some measures taken by the government allowing 100% FDI in the hotel industry (including construction of hotels, resorts, and recreational facilities) through the automatic route, elimination of customs duty for import of raw materials, equipment, liquor etc and certain policy measures for tourism industry will help the growth of hospitality industry in the coming decade.

TABLE NO 1: GROWTH OF STAR HOTELS IN INDIA (SINCE 2003 TO 2010)

Year	5 Star	4 Star	3 Star	Total
2003	149	111	451	711
2004	152	120	472	744
2005	158	123	477	758
2006	167	125	480	772
2007	173	135	492	800
2008	179	141	534	854
2009	184	146	537	867
2010	199	151	683	1033

Source: Evolution and contemporary challenges facing Human Resource Professionals at the dawn of the XXI century: Effect of Social Media in Star hotels in India by Dr. Kunal Bhattacharya & Mr. Herman Singh Thomas

FIG. NO-01- GROWTH OF STAR HOTELS IN INDIA (FROM 2003 TO 2010)

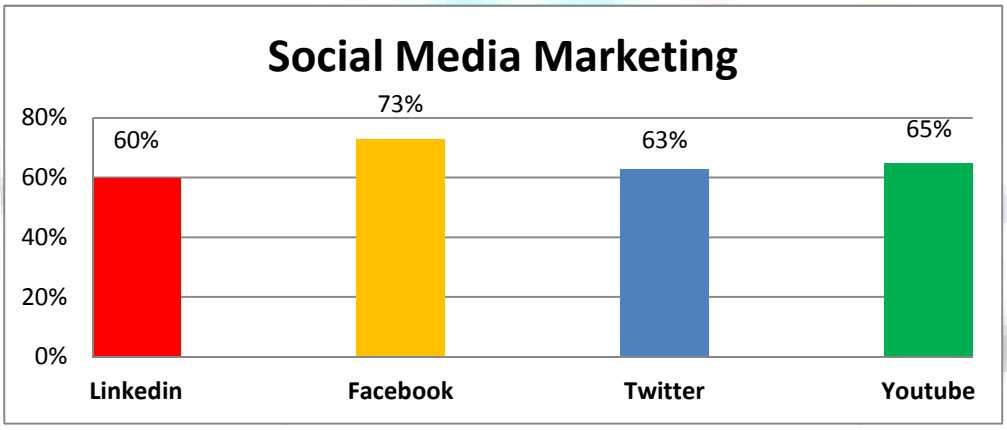


Source: Evolution and contemporary challenges facing Human Resource Professionals at the dawn of the XXI century: Effect of Social Media in Star hotels in India by Dr. Kunal Bhattacharya & Mr. Herman Singh Thomas

INCREASE IN DOMESTIC TRAVEL: Increased Free Trade Agreements (FTA) and tourist movement within the country has aided growth in the hospitality industry. Growing interest in domestic tourism and availability of matching and easy financial options, propels business tourism thereby positively impacting hospitality industry. As per the ICRA quarterly review of March 2012, the number of international tourists in India grew by 4.4% which is a tad lesser than the growth projections of last year which was at 7%. This could partly be associated to the natural disasters in Japan, unrest in middle-east and the ongoing economic crisis in Europe. Outbound travel too, has dropped drastically. Depreciating rupee has brought domestic travel back to the table with many families deciding to spend less on their holidays. The hotel industry has realized that they now have to deal with quantum of travellers and not aim to maximize margins because the domestic traveller is only too conscious about the budget. 5 star hotels as well as budget hotels are coming up with innovative offerings like a spa package or a free meal or happy hours to cater to the needs of the budget traveller.

SOCIAL CUSTOMER RELATIONSHIP MANAGEMENT (CRM): Social media is fast becoming the choice of customers. Facebook, Twitter, YouTube are quickly becoming the best marketing tools at the disposal of hospitality industry. About one - third of online time spent by people is on networking and communicating through emails, social networks, blogs, and instant messages which is a 43 percent increase over 2009. CEO of Facebook reported that the site will have more than 1 billion users in 2011(Sweney, 2010). But, in 2012 the number of Facebook users in the world is 850 million. A survey carried in India indicated that Facebook with 73 % was the most used social website for corporate marketing. Overall, most social media sites have made the hotel industry deeply accessible as well as accountable for the services they offer.

FIG. 2: GRAPH SHOWING DIFFERENT SOCIAL MEDIA SITES USED FOR SOCIAL MEDIA MARKETING



Source: Effect of Social Media in Star hotels in India by Dr. Kunal Bhattacharya & Mr. Herman Singh Thomas.

INTERNATIONAL EVENTS AND INDIA'S EMERGENCE AS A BUSINESS HUB: Growing number of international events being organized in India is another reason which has worked in the favour of Indian hospitality industry. Rock concerts, sporting events, business meets are all contributing towards large influx of foreign tourists.

CHANGING CONSUMER DYNAMICS AND EASE OF FINANCE: Highly disposable income arising out of high salary and choice of modern youngsters for quality life over personal savings, has changed the pattern of spending. Being brand conscious and having the power to spend has enhanced consumer spending. Affordability, credit culture, personal loans are chasing youngsters to week - end and periodical leisure hunts which is not only providing a facelift to tourism but is also propelling the growth of hospitality industry.

NEED FOR THE STUDY AND IMPORTANCE OF THE RESEARCH PROBLEM

Hospitality industry is poised for a vertical growth in the coming years as there are many positives to look forward. However with the crash in world economy, there are many factors which are hampering the rate at which the industry could be growing. There is a need for the hospitality industry to identify these challenges and adopt remedial measures to counter them. This study aims to delve into these challenges and suggest changes for the benefit of hospitality industry.

OBJECTIVE OF THE STUDY

To highlight the main challenges faced by the hospitality industry, envision a change and explore solutions for sustainability in the ever - changing market scenario.

RESEARCH METHODOLOGY

This paper examined a number of hospitality and hotel associated websites from around the world, used publicly accessible secondary data in the form of customer reviews, published statistics, and texts including theoretical work, secondary analyses by 'experts' and reports to offer solutions to the challenges faced by hospitality industry.

FINDINGS AND REMEDIES

SUSTAINABLE DEVELOPMENT OF HOTEL INDUSTRY

Environment conservation and enhancement are vital for hospitality industry. Sustainable dreams are in mind leading to discussions but less of action, though the evolving trend is to watch hotels on their degree of environmental and social commitment. Benchmarking is capturing attention and progressing to develop (Wöber, 2001). Aggressive social views on sustainable development and forthcoming government regulations, environmental issues and conservation add up to the challenges. Unless, stakeholders keep pace with these changes, it would affect their competitive positioning and profitability.

Environmental responsibility is turning out to be a corporate issue. Issues of sustainability will soon be enforced to safeguard the scarce natural resources leading to a tough business environment. Hence aspects associated with sustainable development should be embedded in most products offered by hotel industry.

CUSTOMER RELATIONSHIP MANAGEMENT

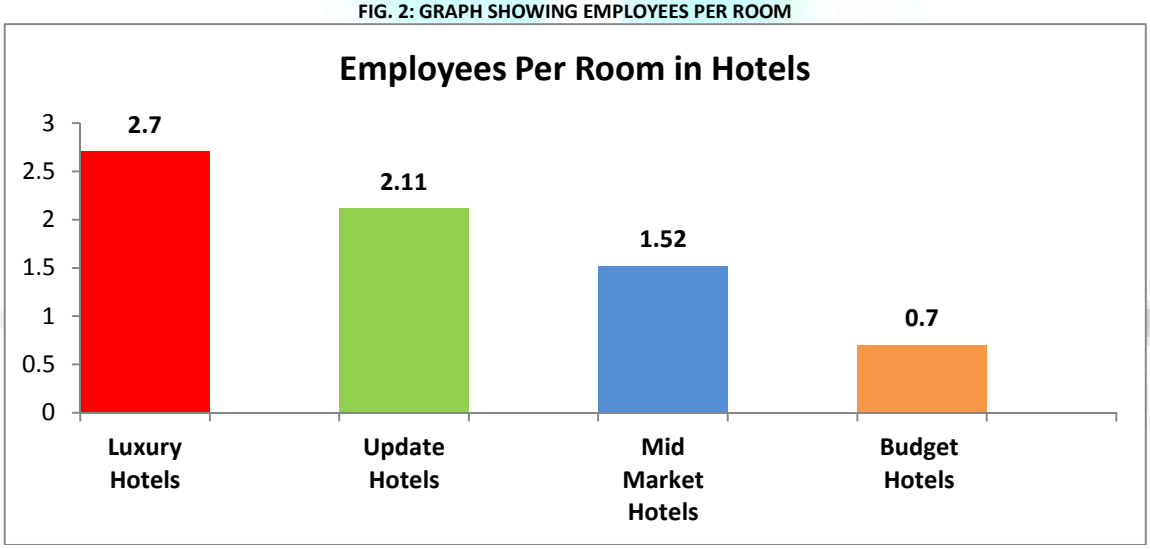
CRM in hospitality industry is used to find frequent but not revenue generating guests. Majority of guests enjoying loyalty programs do not bring in more revenue and hotels do not have a system in place to quantify the other income generated.

Customers should be well understood as their needs are fluid and by the time one comes to terms with them, fresh needs will be there to be taken care off. Rather than implementing a CRM loyalty program just because a competitor has one, hospitality executives need to look at how CRM tools can give necessary information to find high-value customers and find specific needs, said Suzanne Clayton, director of hospitality and gaming at SAS Institute, Raleigh-Durham, North Carolina Area. An effective data base can give a background check on the clientele and help the service provider to give satisfying customer experience by catering to their needs. Hotels should use available or generate such tools to differentiate between frequent and profitable customers and formulate a strategy to engage them in lavish spending by establishing a long but continuous relationship. This will help in predicting their future requirements and plan in investing in such facilities. Organizations should come out of conventional thinking and be innovative. Creativeness and innovation will not only play a role in the growth of hospitality industry, but, play a major role in attracting and retaining new guests while keeping the existing guests happy.

SKILLED STAFF SHORTAGE

Hospitality industry being one of the largest employment generators in the country, provides employment to 36% skilled and 64% semi-skilled/unskilled persons (Baum, 1995). Three to five jobs are created for every room constructed. There is an acute shortage of skilled staff (Choi et al, 2000) making it a critical issue to balance supply and demand. In India, the average employee-to-room ratio at 1.6 (2008-09), is higher than that for hotels across the world. Hotels try to make their property special to customers leading to higher need of skilled workforce. Though talent crunch is felt at senior and mid management levels, shortage of front line staff is acute due to their demand in service heavy industries like airline, banking, BPO, etc which leads to a mismatch of demand and supply. A study report of Tourism Ministry indicates that existing supply of human resources do not even cater to 40% of the demand leading to employment of untrained persons compromising quality of services offered by hotels.

FIG. 2: GRAPH SHOWING EMPLOYEES PER ROOM



Source: HVSIHMS Survey, 2011 Edition

Few corporate hotels have established their own culinary school to feed them with trained and skilled workforce. Other hotels should have a memorandum of understanding with hospitality institutes for their staff requirement. Simultaneously hotels should have close cooperation with such institutes for student training, staff orientation capsule, funding for research and training on modern gadgets and equipment.

CULTURAL DIVERSITY, EMPLOYEE TURNOVER AND TALENT RETENTION

Hotel industry highly depends on effective and quality human resources who can woo their customers and retain them. According to a study by Nelson and Dobson, the main elements of success in the hospitality education are the excellence of graduates and their retention in industry (Nelson and Dobson, 2001). Race for talent from the competing service sector and within the sector has made attrition a significant issue for the industry, especially when availability of quality talent is scarce. Over the last three years, attrition rates in entry and mid-management level have doubled. Employee attrition rate in industry is at 25-

30 per cent across different levels. High staff turnover is a perpetual problem plaguing the hospitality industry due to shortage of skilled labour and the industry does not have any control on staff retention. Pay, incentives, working conditions, employee welfare and employer credibility are moderate in the industry making it difficult to attract experienced and skilled workforce and retain them which has become the greatest challenge for hospitality industry (Barron, 2008). Diverse work force is slowly catching up in hotels for efficient service and profitability but it would be difficult to manage such diversity.

Programs should be evolved periodically to involve the family and create an atmosphere which would make it difficult for an employee to break the bond. Manager's personal rapport and good relationship with employees, understanding their personality, family background and problems, helping attitude, social interaction, celebration of multi religious festivals, and adopting a policy of being listened and respected would definitely support turnover reduction. It is proved that creating such a family atmosphere can successfully help retention (Frabotta, 2001). Employee relationship management is key reason for employee retention, especially in an increasingly multi-cultural and competitive scenario. Multicultural training will enhance awareness of cultural diversity in employees and enable a culturally enriched environment (Baum et al, 2007), thus enabling their retention.

SECURITY

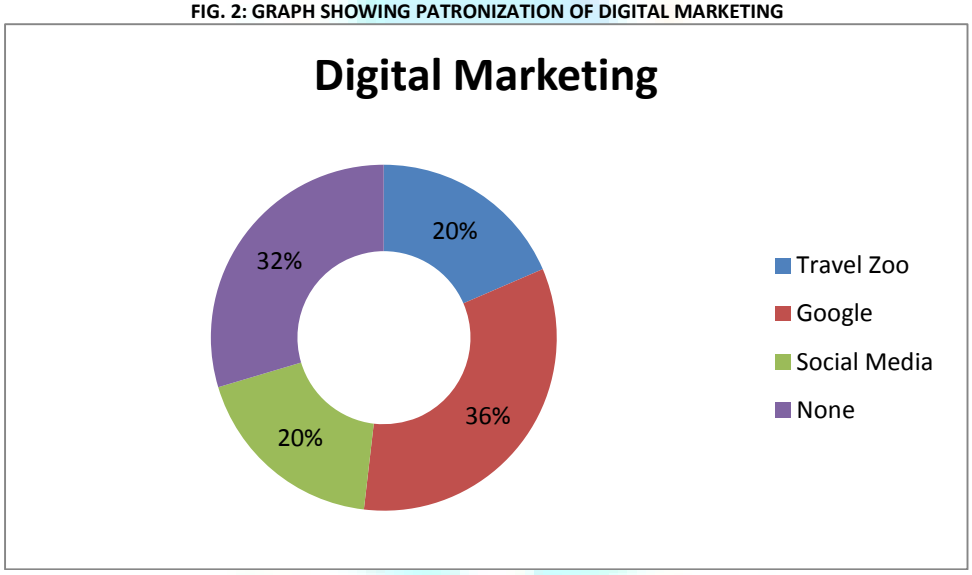
Security is becoming an important factor dictating the growth of hospitality industry. Hotels are not designed with security in mind and thus become soft targets. Terror strikes, insurgency in north and east, political unrest in various parts of the country, moral policing issues have all hampered the security environment of hospitality industry adversely affecting tourist sentiments. Mumbai terror attacks were depressing and raised safety concerns leading to customer discomfort, owing to tight security measures at vital areas and vulnerable points. Cybercrime is fast catching up and turning out to be a serious issue with innumerable internet frauds adversely impacting online spends. Theft of data related to guest identity profile due to phishing is another danger of technology. Overall the security environment is challenging.

Enhanced security screening balanced with favorable customer perception should differentiate a suspicious activity from a tourist activity. Security should not be intrusive but indiscreet and professional. As a deterrent some security measures should be visible. Proactive security plans interfaced with modern security devices along with trained staff will provide a safe environment, protect guest interests and enhance the image and reputation of hotels. Department of Tourism had warned that luxury hotels would lose their star rating if effective security plans are not in place. Training the staff on cyber security threats, protection and responsibilities along with adoption of current cyber security systems will help avert cyber thefts.

DIGITAL MARKETING

Contrary to established opinion, a recent research by Ecole hoteliere de Lausanne (Switzerland) and Rate Tiger finds that social medial is shunned by hotel industry as only one in three hotels use them where as one in eight do not use them, relying on direct booking. In the short – term, hotel industry would be in a quandary whether to invest in social media.

FIG. 2: GRAPH SHOWING PATRONIZATION OF DIGITAL MARKETING



Source: Ecole Hoteliere de Lausanne (EHL) Research

Till such time it becomes possible to track the sales through online marketing, it would be premature for the industry to avoid digital marketing. More and more people are joining the wagon of tech savvy customers and hence hotels must explore the growth potential of online spending and smart phone technologies by embracing social media and mobile marketing strategies. Simultaneously the hospitality industry must integrate digital technologies with marketing strategies, gain access to client relationships that would otherwise be lost to online travel agencies, position the brand at the forefront of online discussions, increase profit margins with direct client bookings and further the brand's image by communicating core values directly and in a complimentary environment to garner greater advantage.

RECOMMENDATIONS

SUSTAINABILITY: Global environmental degradation should be countered with environmental protective measures to tread on a sustainable path. For enhancing environmental awareness and evolving an eco-friendly practice on architecture, construction and operation of hotels, necessary training should be organized by the government and NGOs to the stakeholders.

EMPOWERMENT OF TOURISM MINISTRY: India has the potential of a worldwide tourist hot spot. India's tourism ministry should be equipped with enough powers and authority to realize that potential. To enable completion of ongoing projects and provision of loans at lower rates for future capital expenditure, infrastructure status should be granted to hospitality industry.

EMERGING REGULATIONS: Regulation will continue to be an important initiator of change, and driver of momentum in business sustainability between now and 2015. This is particularly evident in the hospitality sector. Efficiency of hotel buildings can only be improved by offering special incentives like lower interest on investment and tax concessions to hospitality sector. Application of uniform luxury taxes and applicable tax on food and beverages across the country will streamline operations and add transparency to the functioning of the hotel industry. Initiatives to speed up the process of visa procurement and extension will help the tourism industry and enhance the performance of the hospitality industry.

TRAINING INSTITUTES: Huge gap exists between the training capacity of educational institutes and the real need of the hospitality industry. A "first of its kind" finishing school which will offer soft skills training to youngsters aspiring for a career in the hospitality industry was launched at Calcutta. Similar schools should be planned by other state governments to overcome shortage of skilled workforce. Over 25% of students trained by IIHM opt for overseas jobs. Staff shortage can only be overcome by establishing additional professional institutes, says Shalini Khanna of IIHM, Bangalore.

COLLEGE FACULTY AND CURRICULUM: Good pay and incentives will overcome shortage of qualified and experienced teaching staff. Outdated college curriculum and hospitality education literature should be revamped and revised periodically (Reigel, 1995), training facilities improved and state of art kitchen

established to meet current industry needs. There was a hotel boom in the late 1980s and 1990s but demand for hotel staff was met by hotel management and catering institutes, but, this time, the industry is not ready. Hotel industry will need to add 100,000 staff within four years, but only about 20,000 are even being trained and a big slice of them will not join the hotel industry, opines Anand, president of the Hotel Association of India.

HUMAN RESOURCE: Current room inventory of major hotel chains is around one lakh which will more than double in the next few years. According to the 2011 Indian Hotel Industry Manpower Survey, the Indian hospitality industry will need skilled manpower of close to 3 lakh people by 2021. A recent Employment Trend survey indicates 40,000 people are required by the end of 2012. India Hospitality Review brings to light that while hotel management schools in India turn out 10,000 graduates a year on an average, the need is much more. Also according to industry experts, the available talent pool has to be re-trained once they get on board for at least three months since there is considerable industry-academic gap. In-house training and development programmes, creation of a talent pool through public private partnerships, opening of hotel management institutes are measures to tide over the problem.

CONCLUSION

The pace of change will differ across the globe but we are approaching a tipping point. Initiated by regulation and changing stakeholder attitudes, by 2015 the political, business and consumer sustainability agendas will have converged on the hospitality industry. Looking further ahead, by 2030 the hospitality landscape will be unrecognizable compared to that of today and sustainability will be one of the pervasive drivers of change. Operations, financial planning, technology, human resources, business models, physical assets and infrastructure have to be synergized to address the challenges encountering hospitality industry from a 360-degree perspective.

SCOPE OF RESEARCH

Related study needs to be conducted to facilitate the hospitality industry to understand futuristic opportunities and threats for evolving a sustainable growth strategy.

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A STUDY ON PERFORMANCE EVALUATION OF PUBLIC & PRIVATE SECTOR MUTUAL FUNDS IN INDIA

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ABSTRACT

Mutual fund provides a readymade option to households for portfolio diversification as well as relative risk aversion through collecting and investing their savings in different risk-return profile instruments. Its performance depends on the performance of underlying portfolio. If one or more schemes perform badly in the portfolio, that can effect or hurt the investment decisions of investors and may get them out from the scenario of wealth creation process. For saving investors' money from such a hazard, it becomes necessary to evaluate the performance of mutual fund portfolio so that investors can take/judge their investment decisions rationally. This evaluation would help in checking the prime idea of "putting all eggs in different baskets" behind mutual funds and guessing that how far this idea is doing well for investors. Therefore, our study has attempted to evaluate the comparative performance of public and private sector mutual fund schemes t he Indian Mutual fund Industry has witnessed a structural transformation during the past few years. Therefore it becomes important to examine the performance of the mutual fund in the changed environment. This paper has evaluated the performance of Indian Mutual fund scheme from 1st April, 2007 to 31 March, 2012. To examine the funds sensitivity to the market fluctuations in terms of beta. To appraise investment performance of mutual funds with risk adjustment the theoretical parameters as suggested by Sharpe, Treynor and Jensen. To rank the funds according to Sharpes, Treynors and Jensons performance measure.

KEYWORDS

risk and return, Sharpes, Treynors and Jensons ratio, NAV.

1. INTRODUCTION

Mutual Funds over the years have gained immensely in their popularity. Apart from the many advantages that investing in mutual funds provide like diversification, professional management, the ease of investment process has proved to be a major enabling factor. However, with the introduction of innovative products, the world of mutual funds nowadays has a lot to offer to its investors. With the introduction of diverse options, investors needs to choose a mutual fund that meets his risk acceptance and his risk capacity levels and has similar investment objectives as the investor.

With the plethora of schemes available in the Indian markets, an investors needs to evaluate and consider various factors before making an investment decision. Since not everyone has the time or inclination to invest and do the analysis himself, the job is best left to a professional. Since Indian economy is no more a closed market, and has started integrating with the world markets, external factors which are complex in nature affect us too. Factors such as an increase in short-term US interest rates, the hike in crude prices, or any major happening in Asian market have a deep impact on the Indian stock market. Although it is not possible for an individual investor to understand Indian companies and investing in such an environment, the process can become fairly time consuming. Mutual funds (whose fund managers are paid to understand these issues and whose Asset Management Company invests in research) provide an option of investing without getting lost in the complexities.

Most importantly, mutual funds provide risk diversification: diversification of a portfolio is amongst the primary tenets of portfolio structuring, and a necessary one to reduce the level of risk assumed by the portfolio holder. Most of us are not necessarily well qualified to apply the theories of portfolio structuring to our holdings and hence would be better off leaving that to a professional. Mutual funds represent one such option. Lastly, Evaluate past performance, look for stability and although past performance is no guarantee of future performance, it is a useful way to assess how well or badly a fund has performed in comparison to its stated objectives and peer group. A good way to do this would be to identify the five best performing funds (within your selected investment objectives) over various periods, say 3 months, 6 months, one year, two years and three years.

Shortlist funds that appear in the top 5 in each of these time horizons as they would have thus demonstrated their ability to be not only good but also, consistent performers. An investor can choose the fund on various criteria according to his investment objective, to name a few:

- Thorough analysis of fund performance of schemes over the last few years managed by the fund house and its consistent return in the volatile market.
- The fund house should be professional, with efficient management and administration.
- The corpus the fund is holding in its scheme over the period of time.
- Proper adequacies of disclosures have to see and also make a note of any hidden charges carried by them.
- The price at which you can enter/exit (i.e. entry load / exit load) the scheme and its impact on overall return

2. LITERATURE REVIEW

Barua and Verma (1991) provided empirical evidence of equity mutual fund performance in India. They studied the investment performance of India's first 7year close-end equity mutual fund, Master share. They found that the fund performed satisfactory for large investor in terms of rate of return. Ippolito (1992) expressed that fund/scheme selection by investors is based on past performance of the funds and money flows into winning funds more rapidly than they flow out of losing funds. Sarkar and Majumdar (1995) evaluated financial performance of five closeended growth funds for the period February 1991 to August 1993, concluded that the performance was below average in terms of alpha values (all negative and statistically not significant) and funds possessed high risk.

Jaydev (1996) evaluated performance of two schemes during the period, June 1992 to March 1994 in terms of returns / benchmark comparison, diversification, selectivity and market timing skills. He concluded that the schemes failed to perform better than the market portfolio (ET's ordinary share price index). Gupta and Sehgal (1997) evaluated mutual fund performance over a four year period, 1992-96. The sample consisted of 80 mutual fund schemes. They concluded that mutual fund industry performed well during the period of study. The performance was evaluated in terms of benchmark comparison, performance from one period to the next and their risk-return characteristics.

Mishra (2001) evaluated performance over a period, April 1992 to December 1996. The sample size was 24 public sector sponsored mutual funds. The performance was evaluated in terms of rate of return, Treynor, Sharpe and Jensen measures of performance. The study concluded dismal performance of PSU mutual funds in India, in general, during the period, 1992-96.

Zakri Y.Bello (2005) matched a sample of socially responsible stock mutual funds matched to randomly selected conventional funds of similar net assets to investigate differences in characteristics of assets held, degree of portfolio diversification and variable effects of diversification on investment performance. The study found that socially responsible funds do not differ significantly from conventional funds in terms of any of these attributes. Moreover, the effect of diversification on investment performance is not different between the two groups. Both groups underperformed the Domini 400 Social Index and S & P 500 during the study period.

Mayank V. Bhatt and Chetan C. Patel (2008) studied the performance comparison of different mutual funds schemes in India through Sharpe index model and concluded that mutual funds are the most popular and safe parameter for an investor to invest.

Kavita Chavali and Shefali Jain (2009) evaluated the performance of equity linked savings schemes and concluded that the fund chosen by the investor should match the risk appetite of the investor. Narayan Rao and M. Ravindran evaluated performance of Indian mutual funds in a bear market through relative performance index, risk-return analysis, Treynor ratio, Sharpe ratio, Jensen measure, and Fama's measure. The results of performance measures suggested that most of mutual fund schemes in the sample of 58 were able to satisfy investor's expectations by giving excess returns over expected returns based on both premium for systematic risk and total risk.

Mutual Fund as an investment vehicle is capturing the attention of various segments of the society, like academicians, industrialists, financial intermediaries, investors and regulators.

3. RESEARCH OBJECTIVES/RESEARCH QUESTIONS/HYPOTHESES

The major objectives of the study are:-

1. To evaluate Mutual Fund Schemes in respect of their risk & return.
2. Analyzing the performance of mutual fund schemes with their benchmark
3. Finding the Volatility of mutual fund schemes by using beta.
4. Provide information about pros and cons of investing in Mutual Funds.

4. RESEARCH METHODOLOGY

Data Sources: Mutual funds which have been operating for greater than five years and performing during the period of study (i.e. 2007 –2012) were selected for the present research. There were 340 such mutual funds belonging to categories - Money market category funds, Debt Category Funds, Equity category funds and balanced category funds, etc. The reasons for studying the performance of mutual fund for a period of five years (2007- 2012) are:

- A large number of mutual funds have been affected during 2007 - 2012.
- The mutual fund industry in India registered notable growth & fluctuations during 2007 – 2012 Period.
- The Indian stock market has fluctuated exceptionally well during 2007 – 2012.

It gives brief ideas related to Mutual Fund investment like

- Comparison of different mutual funds & their schemes
- By using what kind of tool customer can safely invest his money
- Information on the risks & returns involved in mutual funds
- Giving the right information to the investor about the safe investments in mutual fund's schemes.
- Analysis of the performance of mutual fund schemes with their Benchmark
- Provide information about pros and cons of investing in Mutual Funds
- Safety of the investment to the customer.

Type of research: Type of research is Descriptive research**,** which is Quantitative in nature**.**

The whole study can be termed as critical study of risk & return of investment in mutual funds. It is purely a quantitative study of available secondary data**.**

Sample Size: Sample size of the study was as below:

Method of sampling is convenience sampling. Six mutual funds and their schemes are selected.

The present study is a sample study. Samples were selected from top & representative mutual funds offered by domestic and foreign AMC's operating in India. Samples drawn for the study includes six funds & their schemes from AMCs, operating in India.

SAMPLE PROFILE

Mutual Funds'Schemes of

1 UTI mutual fund
2 SBI mutual funds
3 Reliance mutual funds
4 Franklin Templeton mutual funds

PERFORMANCE MEASURES

The Treynor Measure

Developed by Jack Treynor, this performance measure evaluates funds on the basis of Treynor's Index. This Index is a ratio of return generated by the fund over and above risk free rate of return (generally taken to be the return on securities backed by the government, as there is no credit risk associated), during a given period and systematic risk associated with it (beta). Symbolically, it can be represented as:

Treynor's Index (Ti) = (Ri - Rf)/Bi.

Where, Ri represents return on fund, Rf is risk free rate of return and Bi is beta of the fund.

All risk-averse investors would like to maximize this value. While a high and positive Treynor's Index shows a superior risk adjusted performance of a fund, a low and negative Treynor's Index is an indication of unfavorable performance**.**

The Sharpe Measure

In this model, performance of a fund is evaluated on the basis of Sharpe Ratio, which is a ratio of returns generated by the fund over and above risk free rate of return and the total risk associated with it. According to Sharpe, it is the total risk of the fund that the investors are concerned about. So, the model evaluates funds on the basis of reward per unit of total risk. Symbolically, it can be written as:

Sharpe Index (Si) = (Ri - Rf)/Si

Where, Si is standard deviation of the fund. While a high and positive Sharpe Ratio shows a superior risk adjusted performance of a fund, a low and negative Sharpe Ratio is an indication of unfavorable performance

Jenson Model

Jenson's model proposes another risk adjusted performance measure. This measure was developed by Michael Jenson and is sometimes referred to as the Differential Return Method. This measure involves evaluation of the returns that the fund has generated. The surplus between the two returns is called Alpha, which measures the performance of a fund compared with the actual returns over the period. Required return of a fund at a given level of risk (Bi) can be calculated as:

Ri = Rf + Bi (Rm - Rf)

Where, Rm is average market return during the given period. After calculating it, alpha can be obtained by subtracting returns of the fund.

Higher alpha represents superior performance of the fund and vice versa. Limitation of this model is that it considers only systematic risk not the entire risk associated with the fund and an ordinary investor cannot mitigate unsystematic risk, as his knowledge of market is primitive.

Beta

Market risk is commonly measured by the Beta co-efficient. Beta reflects the sensitivity of the fund's return to fluctuations in the Market Index. The formula for calculating Beta may be stated as;

Beta value= (σi /σm) X pim

Where —σi is the standard deviation of the fund, —σm is the standard deviation of the Market, and —pim is the correlation coefficient of the portfolio with market.

Standard Deviation

Standard deviation is a measure if dispersion in return. A high value of standard deviation means high risk.

HYPOTHESES OF THE STUDY

1. There is no significant difference between the returns of different mutual fund schemes of respective mutual fund categories.
2. There is no significant difference between the returns of mutual funds of different mutual funds categories. The broader hypothesis for the study would be as under.

Ho: There would be no significant difference in performance of various selected six Mutual Funds in various sectors.

H1: There would be significant difference in performance of various selected six Mutual Funds in various sectors.

Above Hypothesis would be expected to review with following sub – parameters which are as under.

a) Level of Risk
b) Level of Return
c) Values of Book Value Ratio and Price Earnings Ratio.
d) Assets under Management
e) Diversification of Assets
f) Net Assets Value.

5. ANALYSIS AND INTERPRETATION:

STUDY OF RETURNS OF GROWTH SCHEMES

Scheme Name	1month %	3month %	6month %	1year %	3 year %	5 years %	Since Inception	Category	Structure
Reliance Growth- Growth	-5.99	-11.12	-19.21	-26.89	18.92	6.38	24.77	Equity	Open Ended
Templet on India Growth Fund - Growth	-6.12	-8.72	-21.04	-29.05	20.63	7.03	15.71	Equity	Open Ended
UTI Equity Fund - Growth	0.51	-3.96	-11.14	-11.30	24.46	8.20	9.09	Equity	Open Ended
SBI Magnum Equity Fund - Growth	1.05	-3.79	-11.54	-10.56	25.29	6.67	10.52	Equity	Open Ended

STUDY OF RETURNS OF DIVIDEND SCHEMES

Scheme Name	1month %	3month %	6month %	1year %	3 year %	5 years %	Since Inception	Category	Structure
Reliance Growth- Growth	-5.99	-11.11	-19.20	-26.89	18.92	6.37	16.96	Equity	Open Ended
Templet on India Growth Fund - Growth	-6.12	-8.72	-21.04	-29.05	20.64	7.03	13.65	Equity	Open Ended
UTI Equity Fund - Growth	0.51	-3.95	-11.13	-11.30	24.43	8.03	8.94	Equity	Open Ended
SBI Magnum Equity Fund - Growth	1.05	-3.78	-11.55	-11.55	25.48	6.76	10.60	Equity	Open Ended

STUDY OF RETURNS OF BALANCED SCHEMES

Scheme Name	1month %	3month %	6 month %	1year %	3 year %	5 years %	Since Inception	Category	Structure
FT India Balanced Fund - Dividend	1.47	-2.78	-7.48	-5.78	17.94	6.66	11.35	Equity & Debt	Open Ended
FT India Balanced Fund - Growth	1.47	-2.78 -	-7.48	5.78	17.93	6.66	13.38	Equity & Debt	Open Ended
UTI Balanced Fund - Dividend	0.73	-4.65	-11.67	-12.47	18.33	4.75	9.39	Equity & Debt	Open Ended
SBI Magnum Balanced Fund - Dividend	1.13	-3.71	-12.41	-14.97	16.09	4.02	12.96	Equity & Debt	Open Ended
UTI Balanced Fund - Growth	0.70	-4.64	-11.64	-12.47	18.55	4.90	12.85	Equity & Debt	Open Ended
SBI Magnum Balanced Fund - Growth	1.13	-3.70	-12.40	-14.96	16.19	4.05	13.72	Equity & Debt	Open Ended

STUDY OF RETURNS OF LIQUID SCHEMES

Scheme Name	1month %	3month %	6month %	1year %	3 year %	5 years %	Since Inception	Category	Structure
Reliance Liquid Fund – Daily Div	0.63	1.82	3.61	7.05	5.17	5.83	4.90	Short Term Debt	Open Ended
Templet on India Cash Mgmt. A/c Fund -Dividend	0.48	1.40	2.69	5.21	3.48	4.24	3.57	Short Term Debt	Open Ended
UTI Liquid Fund – Cash Plan - Daily Div	0.65	1.88	3.74	7.24	5.11	5.72	4.54	Short Term Debt	Ope Ended
SBI Premier Liquid Fund – IP - Daily Div	0.62	1.80	3.57	6.99	5.00	5.51	4.41	Short Term Debt	Open Ended
Reliance Liquid Fund – Growth	0.79	2.32	4.61	9.08	6.65	7.47	7.23	Short Term Debt	Open Ended
Templet on India Cash Mgmt. A/c Fund - Growth	0.61	1.78	3.46	6.78	4.55	5.49	5.38	Short Term Debt	Open Ended
UTI Liquid Fund – Cash Plan - Growth	0.74	2.16	4.31	8.41	6.09	6.89	6.28	Short Term Debt	Open Ended
SBI Premier Liquid Fund – IP - Growth	0.79	2.29	4.56	8.97	6.41	7.06	6.49	Short Term Debt	Open Ended

STUDY OF RETURNS OF INCOME SCHEMES

Scheme Name	1month %	3month %	6month %	1year %	3 year %	5 years %	Since Inception	Category	Structure
Reliance Income Fund – Retail - Dividend	2.07	2.29	4.03	6.01	2.51	7.57	6.23	Debts	Open Ended
Templet on India Income Fund - Dividend	0.63	1.65	3.68	7.69	5.07	5.72	5.64	Debts	Open Ended
UTI Bond Fund - Dividend	1.24	2.74	5.53	10.26	2.87	7.95	7.34	Debts	Open Ended
SBI Magnum Income Fund - Dividend	1.63	2.82	4.61	8.15	3.22	3.94	4.73	Debts	Open Ended
Reliance Income Fund – Retail - Growth	2.07	2.29	4.03	6.57	3.37	7.91	9.14	Debts	Open Ended
Templet on India Income Fund - Growth	0.63	1.80	3.83	8.24	5.61	6.73	8.90	Debts	Open Ended
UTI Bond Fund - Growth	1.59	3.10	6.16	11.21	3.63	7.37	8.56	Debts	Open Ended
SBI Magnum Income Fund - Growth	1.63	2.82	4.83	8.62	3.64	4.94	7.23	Debts	Open Ended

CALCULATIONS AND STUDIES OF DIFFERENT MEASURES OF RISK

S.D., Beta, Sharpe & Treynor of Equity & Growth Schemes as on 31st March, 2012

Scheme Name	S.D.	Beta	Sharpe	Treynor
Reliance Growth - Growth	**3.73**	**0.86**	**0.05**	**0.23**
Templeton India Growth Fund - Growth	3.75	0.86	0.06	0.25
UTI Equity Fund - Growth	**3.08**	**0.73**	**0.08**	**0.33**
SBI Magnum Equity Fund - Growth	**3.76**	**0.88**	**0.06**	**0.24**

S.D., Beta, Sharpe & Treynor of Growth dividend Schemes as on 31st March, 2012

Scheme Name	S.D.	Beta	Sharpe	Treynor
Reliance Growth - Dividend	**3.73**	**0.86**	**0.05**	**0.23**
Templeton India Growth Fund - Dividend	**3.75**	**0.86**	**0.06**	**0.25**
UTI Equity Fund - Dividend	**3.08**	**0.73**	**0.08**	**0.33**
SBI Magnum Equity Fund - Dividend	**3.75**	**0.88**	**0.06**	**0.25**

S.D., Beta, Sharpe & Treynor of Balanced Schemes as on 31st March, 2012

Scheme Name	S.D.	Beta	Sharpe	Treynor
FT India Balanced Fund -Dividend	**2.46**	**0.90**	**0.05**	**0.15**
FT India Balanced Fund - Growth	**2.46**	**0.90**	**0.05**	**0.15**
UTI Balanced Fund - Dividend	**2.72**	**0.98**	**0.06**	**0.17**
SBI Magnum Balanced Fund - Dividend	**2.97**	**1.08**	**0.04**	**0.10**
UTI Balanced Fund – Growth	**2.72**	**0.98**	**0.06**	**0.17**
SBI Magnum Balanced Fund - Growth	**2.97**	**1.08**	**0.04**	**0.10**

S.D., Beta, Sharpe & Treynor of Liquid Schemes of Selected Mutual Funds as on 31st March, 2012.

Scheme Name	S.D.	Beta	Sharpe	Treynor
Reliance Liquid Fund – Daily Div	**0.03**	**0.46**	**-0.26**	**-0.02**
Templeton India Cash Mgmt. A/c Fund - Dividend	0.03	0.45	-1.38	-0.09
UTI Liquid Fund – Cash Plan -Daily Div	0.03	0.50	-0.32	-0.02
SBI Premier Liquid Fund – IP - Daily Div	0.03	0.44	-0.45	-0.03
Reliance Liquid Fund – Growth	0.04	0.60	0.53	0.03
Templeton India Cash Mgmt. A/c Fund - Growth	0.04	0.58	-0.53	-0.03
UTI Liquid Fund – Cash Plan -Growth	0.04	0.58	0.24	0.01
SBI Premier Liquid Fund – IP –Growth	0.04	0.57	0.34	0.02

S.D., Beta, Sharpe & Treynor of Income Schemes of Selected Mutual Funds as on 31st March, 2012.

Scheme Name	S.D.	Beta	Sharpe	Treynor
Reliance Income Fund – Retail- Dividend	0.81	1.99	0.06	0.02
Templeton India Income Fund- Dividend	0.36	0.89	0.05	0.02
UTI Bond Fund - Dividend	0.82	1.78	0.05	0.02
SBI Magnum Income Fund - Dividend	0.62	1.44	0.01	0.01
Reliance Income Fund – Retail - Growth	0.80	2.00	0.08	0.03
Templeton India Income Fund - Growth	0.37	0.91	0.08	0.03
UTI Bond Fund - Growth	0.82	1.79	0.07	0.03
SBI Magnum Income Fund - Growth	0.62	1.43	0.02	0.01

6. RECOMMENDATION/SUGGESTION/FINDINGS

RESEARCH FINDINGS

This research work has find out the following facts and figures about the risk and returns of selected Mutual Funds Schemes as on 31st December, 2011.

(1) Not any of mutual fund schemes is best on the short-term basis. Hence, on the basis of recent returns, UTI Equity-G is the best options and on the basis of far previous year returns, Reliance Growth.G is the best options. Therefore on overall basis Reliance Growth.G is the best option.

(2) Not any of mutual fund schemes is best on the short-term basis. On the basis of recent returns, UTI Equity-D is the best options and on the basis of far previous year returns, Reliance Growth.D is the best options. Therefore on overall basis Reliance Growth.G is the best option.

(3) Returns are positive for 1 month of FT India Bal. Fund.D&G, SBI Mag. Bal. Fund.D&G and UTI Bal. Fund.D&G . That is on the basis of 1 month return FT India Bal. Fund.D&G, SBI Mag. Bal. Fund.D&G are the best option. Options with negative returns are not selected. On the basis of long-term returns & returns since inception SBI Mag. Bal. Fund.D&G & FT India Bal. Fund.D&G are the best options. Therefore on overall basis SBI Mag. Bal. Fund.D&G is the best option.

(4) The top selected liquid schemes are Reliance Liq. Fund-G, SBI Pre. Liq. Fund-IP.G, UTI Liq. Fund.CP-G and in their descending order for short-term up to 1 year, i.e. best one is Reliance Liq. Fund-G on the basis of short-term, i.e. up to 1 year. On the basis of 3 yrs., 5 yrs. and return since inception, maximum return is secured by the Reliance Liq. Fund-G, then by the SBI Pre. Liq. Fund-IP.G, UTI Liq. Fund.CP-G in their descending order for 3 yrs., 5 yrs. returns and

SBI Pre. Liq. Fund-IP.G and UTI Liq. Fund.CP-G for return since inception. Therefore, Reliance Liq. Fund-G is the best one on overall basis long-term and short-term both.

(5) On the basis of all the short-term period up to 1 year, we see that UTI has performed well on the basis of 3 months, 6 months and 1 year. But in the last 1 month Reliance have performed well comparative to others in their descending order. Hence, best option is UTI Bond Fund-G on short-term as well as long-term basis. But Templ. India Income Fund-G&D have secured more returns for 5 years period comparative to others & best one is Templ. India Income Fund-G.

(6) On the basis of Standard Deviation., SBI Mag. Equity Fund.G, Templ. India Growth Fund-G, Reliance Growth-G and UTI Equity Fund-G are most risky in their descending order. UTI Equity Fund-G is least risky on all risk bases. On the basis of Beta the pattern is almost similar to the previous one. As per Sharpe and Treynor, returns are good enough or compensate the risk taken by investors by investing in these. The best option is UTI Equity Fund-G.

(7) On the basis of Standard Deviation, SBI Mag. Equity Fund.D, Templ. India Growth Fund-D, Reliance Growth-D and UTI Equity Fund-D are most risky in their descending order. UTI Equity Fund-D is least risky on all risk bases. On the basis of Beta, the pattern is almost similar to the previous one. As per Sharpe and Treynor, returns are good enough or compensate the risk taken by investors by investing in these. The best options, in their descending order, are UTI Equity Fund-D.

(8) On the basis of Standard Deviation. SBI Mag. Balance Fund. D&G, UTI Balance Fund-D&G and FT India Balance Fund-D&G are most risky in their descending order. FT India Balance Fund-D&G are least risky on all risk bases. On the basis of Beta, the pattern is almost similar to the previous one. As per Sharpe and Treynor, returns are good enough or compensate the risk taken by investors by investing in these. Therefore, on overall basis UTI Balance Fund-D&G are the best options.

(9) On the basis of Standard Deviation. Reliance Liq. Fund-Dly D, SBI Pre. Liq. Fund-IP.Dly D, UTI Liq. Fund.CP-Dly D andTempl. India CM A/c Fund-D are least risky with same risk. Schemes with dividend option are least risky on all risk bases. On the basis of Beta, the pattern is little bit different. The pattern is Reliance Liq. Fund-G, SBI Pre. Liq. Fund-IP.Dly D in their descending order of risk. SBI Pre. Liq. Fund-IP.Dly D is the least risky. Sharpe and Treynor are positive only for Reliance Liq. Fund-G, and SBI Pre. Liq. Fund-IP.G, UTI Liq. Fund.CP-G. That shows that the returns are good enough or compensate the risk taken by investors by investing only for/in Reliance Liq. Fund-G and SBI Pre. Liq. Fund-IP.G, UTI Liq. Fund. Therefore the best one is Reliance Liq. Fund-G and the worst one is Templ. India CM A/c Fund-D.

(10) On the basis of Standard Deviation. UTI Bond Fund-D&G, Reliance Income Fund-Ret.- D&G, SBI Mag. Income Fund. D&G and Templ. India Income Fund-D&G are most risky in their descending order. Templ. India Income Fund-D&G are least risky on all risk bases. On the basis of Beta, the pattern is almost similar to the previous one. As per Sharpe and Treynor, returns are somewhat enough or compensate the risk taken by investors by investing in these. The best options, in their descending order, Templ. India Income Fund-G, Reliance Income Fund-Ret.-G, Therefore, on overall basis Templ. India Income Fund-G is the best options.

7. LIMITATION OF THE STUDY

This report gives an insight about mutual funds and mutual fund Schemes but with few limitations as follows:

The big question is how to judge a mutual fund before investing? It is important for an investor to consider a fund's performance over several years.

The report only analyses mutual fund schemes of only some funds. There are around 44 AMCs offering wide range of schemes but to analyze all of them is a tedious task.

Information is mainly collected regarding top and representative mutual funds.

Different fund managers adopt different strategies to improve performance. While one fund manager may have invested in speculative stocks over a period, another one who have invested in speculative stocks may have struck gold in that year to outperform the former by a long way.

Lack of proper knowledge and awareness about advantages and disadvantages associated with various schemes among the investor.

- The time period for the project was limited and information provided is limited to the extent of internet and journals.
- The sample size is limited to only six mutual funds.
- The study is limited to mutual fund schemes in respect of their risk, return and liquidity.
- The analysis is mainly based on share price and unit price information.

To get an insight in the process of portfolio allocation and deployment of funds by fund manager is difficult.

The project is unable to analysis each and every scheme of mutual funds to create the ideal portfolio.

The portfolio of mutual fund investments can change according to the market conditions.

8. CONCLUSIONS

This research work has find out the following facts and figures about the risk and returns of selected Mutual Funds Schemes as on 31st March, 2012. On these risk and returns we conclude that.

ON THE BASIS OF RETURN

The major market of Mutual Fund is in Income schemes, Growth schemes and Liquid schemes, out of which Growth market is mostly leaded by UTI and Templeton on the basis of, mainly, returns up to 5 years. No doubt that in Growth SBI and Reliance have also performed well, out of which one is private Indian MF and other is Bank sponsored MF.

The situation is same in both, dividend & growth options of Equity & Growth schemes of selected Mutual Funds.

In Balanced schemes, Franklin Templeton and then UTI & SBI are also performing well. On overall basis SBI Mag. Bal. Fund D&G is the best option.

In Liquid & Money Market schemes, the situation are little bit different with the leading Mutual Funds Reliance, SBI and UTI are performing well in their descending order.

Therefore, Reliance-G is the best one on overall basis long-term and short-term both.

In Income & Bond schemes, leading players Templeton and UTI, Reliance are performing well in their descending order. SBI has also performed well with other on the same criteria, i.e. on the basis of returns.

With Dividend option, Reliance Growth-D, UTI Equity Fund-D, Templeton India Growth Fund-D all are best on the basis of NAV creation through their overall long term better performance in descending order.

With Growth option, Reliance Growth-G is best on the basis of NAV creation through their overall long term better performance in descending order.

ON THE BASIS OF RISK

Risk is highest with SBI, Templeton, Reliance and UTI in their descending order in Equity & Growth segment with both the options.UTI is least risky on all risk bases. On the basis of risk adjusted return best options, in their descending order, is UTI Equity & Growth segment with both the options. Therefore, UTI is also the best options on, both, the risk & return bases.

SBI and UTI most risky in their descending order in the balance segment. Franklin Templeton is least risky on all risk bases. On the basis of risk adjusted return best options, UTI balanced fund D&G. Therefore, on overall basis UTI is the best option.

In Liquid & Money Market segment, schemes with dividend option are least risky on all risk bases. In which SBI is the least risky. On the basis of risk adjusted return best options, in their descending order, are Reliance, SBI and UTI with Growth option. Therefore, the best one is Reliance-G and the worst one is Templeton-D.

UTI and Reliance are most risky in their descending order in Income & Bond segment. Templeton is least risky on all risk bases. On the basis of risk adjusted return best options, are Templeton and Reliance with Growth options. Therefore, on overall basis Templeton-G is the best options.

But in the present scenario market is not performing well. That's why MFs schemes are not performing well except liquid and income schemes in the short run.

So, in nutshell, we can say that Reliance and SBI are beneficial for investment in Liquid & Money Market schemes in all aspects. Templeton and Reliance are best for Income &

Bond schemes. UTI & Templeton are best for Equity & Growth schemes and Franklin Templeton is best for balanced scheme.

These are best in different schemes because these are best approximately in each and every aspect of these schemes. Hence, we can say that the…

(1) Mutual Funds are growing in number and gaining popularity among small investors with an exception of last 1 month to 1 year, especially in the case of Equity & Growth schemes and balanced scheme.

(2) Preferences of investors are different towards different type of schemes as well as organization. Acceptability of Mutual Funds has changed the pattern of investments.

(3) Mutual Funds generally in the long run outperform the market.
Returns provided by the Mutual Funds are generally better in long run than the returns provided by the other similar investment. Movement in market prices of schemes is positively related to the movements in NAV.

(4) The return and risk-adjusted return on Mutual Funds are satisfactory in long run except during the recession.

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DETERMINANTS OF RURAL HOUSEHOLDS LOAN REPAYMENT PERFORMANCE, IN OROMIA NATIONAL REGIONAL STATE: THE CASE OF DODOTA WODEDA

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ABSTRACT

A study was conducted to identify factors affecting loan repayment performance of Rural Householders in Dodota Woreda (District), Oromia Region of Ethiopia. It has tried to assess the extent to which rural credit service provided by MFIs functions and how default and non-default rates are associated with socio-economic characteristics of rural households in the study area Necessary data were collected from both primary and secondary sources. The cross sectional primary data was collected from selected rural households and experts of the financial institute operating in the study area. Stratified sampling technique was employed to select rural household clients of two MFIs, OCSSC (Oromia Credit and Saving Share Company) Microfinance and KSCUCS.s (Keleta Saving and Credit Union) operating in the study area. Descriptive analysis result shows that the loan default rate in the study area is very high. Around 39% of the clients of the selected MFIs have defaulted on their loan either technically or financially. The Logistic regression analysis revealed the fact that the borrowers (rural households) age, sex, number of oxen owned, land holding size, access to extension service, loan supervision, and training before loan were found to be positively and significantly affecting rural households' decision to fully and timely repay their loan. However, household size and the level of interest rate are the major factors which are responsible for the increase in the default rate of households in the study area. Surprisingly, households fertilizer use, off farm income, irrigation use, and amount of money spent on nonproductive (festival) purpose were found to have no significant impact on the rural households' loan repayment performance.

KEYWORDS
Dodota Woreda, Rural households, Micro financing, Loan repayment, Logit model.

INTRODUCTION

In Ethiopia, agriculture is a dominant economic activity. The livelihood of the population in rural areas is mainly based on agriculture – typically mixed farming. The agricultural sector accounts for nearly 44% of the GDP and provides employment for 85% of the population (MoFED[4], 2010). The sector is characterized by small and subsistent farming.

In spite of its vast agricultural potential, Ethiopia has been trapped in the state of food insecurity and poverty. The country has been chronically dependent on food aid, and it is currently one of the largest recipients of food aid in Africa (Teklay and Solomon, 2013). In an effort to improve the precarious food situation in Ethiopia, expanding the use of new and improved technologies are crucial issues that has to be considered both by policy makers and development partners.

In Ethiopia among other things, lack of finance is one of the major problem impending production, productivity and income of rural and urban population. Since access to institutional credit is very limited, majority of the poor obtained financial service through informal money lenders, from their families and other informal sources

Access to financial services to small farmers is regarded as one possible strategy to gradually transform the subsistent farmers into commercial. Agricultural credit is a critical input required by the small farmers to establish and expand their farms and hence increasing their agricultural production and their farm income. Agricultural credit also enables the poor farmers to fully utilize their farm resources and take advantage of the potential profitable investment opportunities in their immediate environment (Zeller and Sharma, 1998). Thus, here comes the importance and significance of the availability of microfinance institutes to bridge the gap between owned and required capital to finance basic farm operations and technologies that would increase production and productivity of the rural community.

In Ethiopia, the importance of agricultural credit in the development of the sector has been underlined strongly by different authors including Bekele 1995; who have concluded that credit helps to bring about the required productivity and food self-sufficiency through the adoption of new and improved technologies. Moreover, Tekaly and Solomon (2013) concluded that rural households without credit access are more exposed to state of being food insecure than the households with relative credit access.

Realizing the importance of access to financial services to the development of rural community, effort has been made by different development partners and government to provide financial services through Micro-financing schemes. The Ethiopian government issued its first microfinance legislation in 1996 (proclamation 40/96) with the aim of providing microfinance service to poor by deposit taking microfinance institutions. As of June 2007, there were about 27 microfinance institutions registered under National Bank of Ethiopia. (AEMFI[5], 2008). These MFIs are operating throughout the country.

However, in Ethiopia like other sub-Saharan African countries, loan default is a bottleneck that impairs the effective implementation and expansion of financial services of Micro-finance institutions. Loan default is also discouraging the financial institutions from refinancing the defaulting members, which put the defaulters once again into vicious circle of low productivity. Farmers who hadn't repaid their last loan could not apply for credit in the next year. As a result they con not acquire all seasonal inputs necessary to run their agricultural activities.

In Oromia Regional State specifically in Dodota Woredas, Oromia Credit and Saving Share Company (OCSSC) and Keleta Saving and Credit Union (KSCU) provide credit for rural householders since 2006. However, the loan repayment performance of the beneficiaries was found to be low, with an average loan recovery rate of 94.1% and 84.8% respectively for last five years (OCSSC, 2012 and KSCU, 2012). If such situation continues, the institutions themselves may default and terminate their financial service provision to the needy rural households.

Therefore, this paper attempted to identify major factors affecting the loan repayment of rural householders in Dodota Woreda in Oromia Regional State of Ethiopia.

[4] MoFED : Ministry of Finance and Economic Development of Ethiopia
[5] AEMFI : Association of Ethiopia Microfinance Institution. Website- www.aemfiethiopia.org (2008), Addis Ababa Ethiopia.

OBJECTIVES OF THE STUDY

The overall objective of this study is to analyze the loan repayment performance of rural householders of Dodota Woreda. Specifically the paper will try to;

- identify socio-economic factors affecting loan repayment and
- identify institutional factors affecting loan repayment

SIGNIFICANCE OF THE STUDY

This study contributes to the existing body of knowledge in the rural community particularly in Dodota Woreda about major factors responsible for rural households' poor loan repayment performance. The study also provides a piece of information which help local governmental and nongovernmental financial institutions, policy makers, policy implementers, to channel their efforts to minimize the loan default rate by designing successful credit programs in the study area and in similar Woredas having similar socio-economic characteristics in Arus Zone. Moreover, the study would provide micro level information for those who would like to conduct detailed and comprehensive studies on rural credit.

RESEARCH METHODOLOGY

STUDY AREA

The study area called Dodota Woreda[6] is found in the East Arsi Zone of Oromia Regional State, south East of Addis Ababa at a distance of 125 km and to the North of Assela. The capital city of the zone, at a distance of 50 km. Dodota is one of the 26 Woredas of Arsi zone. The historical name of the Woreda is derived from trees name mostly found in the rift valley named as "Dodota". However before 2004 the Woreda named as Dodota Sire. But due to the decentralization policy of government, Sire as a Woreda separated from it. Curerently Dodota has 14 kebeles[7] of which 12 are kebeles and 2 urban administrations in Dera town. The Woreda is located between $8^0$10'N to $8^0$30'N Latitude and $39^0$10'E to $39^0$30'E Longitude. Relatively; Dodota is found North of Hetosaa, North- west of Lode Hetossa, West of Sire,East of Zuway Dugda Woreda and South of East Shewa Zone, With the total area of 445.6 Km^2.

According to Agricultural Development Office (2011) the study area (Dodota Woreda) is dominated by kolla[8] climate, with altitude ranging from 500m-1300 masl. The annual average rainfall ranges between 500 mm-900mm notably in the main rainy season of summer (June to August) , with temperature renege between 15^oC-27^oC. From total area of Woreda, about 49.3 % and 16.10% are used for crop production and construction and residential purpose. The soils in the Woreda are characterized as fertile sandy to clay soils which is more productive with irrigation but there are shortage of rain & water in the area. Due to its rift valley location and desertification, the Woreda has low network of river systems. The Woreda has high potential for both traditional and modern irrigation system mostly from Awash River for production of sugar cane, fruits, and vegetables.

According to the 2007 population census, population of the Woreda was reported to be 72680 of which 36576 were males and 36104 were females. 68% of the population live in the rural areas and gain their livelihood from agricultural sector. The overall population density of the Woreda was '163 p/$km^{2;}$ and agricultural density was 114p/km^2. In the Woreda, the average family size in the rural areas was 7.2 persons per household.

The study area is characterized by production of annual food crops and livestock rising. The major annual crops grown in the Woreda are cereals, Pulses and Oil Seeds. From cereal crops Wheat, Barley, Maize and Teff, are the most widely grown once. In addition, the Woreda is known in producing some cash crops like sugar cane, tomato, onion and different fruit by the use of irrigation.

Livestock production takes different forms such as providing traction power for land preparation; threshing and transportation as well as using manure to fertilize the soil for crop production and the livestock products are used as a source of food for the family. Similarly, crop production can contribute to livestock production by supplying feed in the form of residuals and stacks. Animal dung is also an important source of energy for households and can be used as a source of income for the farmer's in the vicinity of the towns. Livestock like, Cattle 43%, Sheep 25%, Goats 25%, Donkeys 6%, Horses 1%, Mules 0.85%, and Camels 0.15% are the major livestock population found in the Woreda. Oxen is the only source of traction power in the area, are owned by most of the farmers. In general, farmers give priority to have oxen ownership relative to ownership of other forms of livestock. As a result, the number of oxen per farmer is second to that of poultry, whose production and management system is simple and later change to beef farming after the end of cultivation of land.

Regarding the financial service access, there are different types of financial service in the Woreda. Microfinance institutes are mostly used for transfer of money and saving of money for the farmers rather than borrowing. The Operation of Mekilit Microfinance is limited only to two urban kebeles in Dera twon.

The Oromia Credit and Saving Share Company (OCSSC) and Keleta Saving and Credit Union (KSCU) are the major microfinance institutions which are operating both in urban and rural kebeles of the Dodota Woreda.

The OCSSC started its operation in Dodota Woreda in 2006 for the purpose of providing financial services to poor people with the initial client number of 440 poor households and loan with the amount of 651640 Birr. In year 2011 this micro finance provided loan to1326 rural and 1681 urban clients with the loan size of 4344965.96 Birr and 5256435 Birr respectively.

Another microfinance institute called OCSSC (Oromia Credit and Saving Share Company) is operating on the basis of group lending. Small and self-formed groups of borrowers, who took on collective responsibility for repayment of loans, were selected on the basis of several criteria, of which business plan and poverty status were the more important ones. To get loan rural households (farmers) of the Woreda are organized in to groups, with the members of 40-60 peoples in each group. Based on OCSSC records, the borrowing interest rate in 2011/12 was 13% per year on average. Borrowers were expected to make regular deposits and repayments. OCSSC reported that, the average loan default rate for OCSSC in 2007 was 3%, but in 2011 it was 7 %.

Before the formation of KSCUC farmers of Dodota Woreda were organized under Self-help to get support and acquire credit from the institution for long period. Later Self-help was shifted to form farmer's cooperative union (now Called Keleta saving and credit union cooperatives) at 2006 with the member of 695 and loan amounts of 856743.6 Birr to improve the livelihood of farmers in the Woreda. In 2011 these cooperatives union provided loan to 2450 rural households (farmers) and 654 nonfarm clients with the loan amount of 7315700.56 Birr and 2943342.86 Birr respectively. To get loan farmers have to save first about 25% of the loan and organized in to groups. KSCUC reported that, the total borrowing interest rate is 15% of which 13% will be paid to KSCUC and 2% for each groups in which the borrower belongs. The average loan default rate for KSCUC in 2007 was 10 %, but in 2011 it has increased to 17%. These imply that the average default rates are increasing over time. If it continues like these, the institution cannot be effective and may not sustain in its operation. Therefore, it is reasonable to identify the major factors affecting the loan repayment performance of rural householders of Dodota Woreda.

SOURCES AND METHOD OF DATA COLLECTION

For the purpose of assessing factors affecting loan repayment performance of rural households both primary and secondary data were collected from different sources. The cross sectional primary data were collected from 191 randomly selected households and experts of the financial institute operating in the study area. Structured questionnaires were used to collect primary data from selected households in the study area. Personal interview was also conducted to collect relevant information from respondents who are working as expert in the selected microfinance institutes (MFIs) of the financial institutes. To ensure the validity of the instrument, the questionnaire was pre tested.

[6] Woreda is the second tier after 'zone' in administrative structure of Federal regions and it is composed of a number of kebeles(the smallest administration structure next to woreda)

[7] kebele is the smallest administrative unit of Ethiopia similar to a neighborhood or a localized and delimited group of people

[8] Kolla is a climatic condition characterized by above 22^oc temperature and annual rainfall less than 1400 mm, below 1500 mater above sea level (m. a.s.l) of elevation,

To supplement the primary data, secondary data were collected from published and unpublished sources of seasonal and annual reports of the Woreda , zonal and regional offices of the Agriculture and Rural Development (ARD), and Financial Institute Office (FIO) where generation of information about the general back ground of the Woreda was made. The total sample size was determined using the following relationship given by Watson (2001).

$$n = \frac{p(1-p)}{\frac{e^2}{Z^2} + \frac{p(1-p)}{N}} \quad \text{----------} \quad (1)$$

Where n represents the optimal sample size, Z is the abscissa of the normal curve that cuts off an area at the tails, e is the desired level of precision, and p is the estimated proportion of an attribute present in the population. Hence, in this paper, the researcher took the proportion of households who have repaid their loan successfully (P= 0.61). The desired a confidence level of 95%.

METHOD OF DATA ANALYSIS

To meet the objectives of the study, both descriptive and econometric analysis were employed. The collected data was analyzed using different Statistical Packages.

MODEL SPECIFICATION

To examine factors influencing the loan repayment performance of rural households, binary logistic regression model was used. The dependent variable is binary or dichotomous and has only two groups: Defaulters and non-defaulters, whereas, the explanatory variables could be continuous, categorical or dummy. In estimating binary choice models the Linear Probability Models (LPM) are the possible alternative models that can be used for a binary response variable (Gujarati, 2004). Some of the problems of applying the Ordinary Least Squares when the response variable is dichotomous are: [1] Non-normality of the disturbances $[\mu i]$, although OLS does not require the disturbances $[\mu i]$ to be normally distributed, we assumed them to be so distributed for the purpose of statistical inference. [2] Heteroscedasticity variance of the disturbances terms: the classical assumption of homoscedastic can no longer be maintained in LPM. As statistical theory shows, for a Bernoulli distribution the theoretical mean and variance are, respectively, P and $P(1-P)$, where P is the probability of success (i.e. in our case the non-default probability of rural household) showing that the variance is a function of the mean. [3] Possibility of $E(Yi/X)$ might lie outside of Logical band; that is, the range of 0 to 1. Hence, there is no guarantee that Ŷi, the estimators of $E(Yi \mid Xi)$, will necessarily fulfill this restriction, and this is the real problem with the OLS estimation of the LPM. [4] Even the fundamental problem with the LPM is that it is not logically a very attractive model because it assumes that $Pi = E(Y = 1/X)$ increases linearly with X; that is, the marginal or incremental effect of X remains constant throughout (Ibd)

In this study the dependent variable is a binary choice, either the householders is defaulters (Y=1) or none(Y=0). It is believed that a set of factors represented as vector *X* affects the probability of being in either of the two groups.

$$prob\ (Y = 1/X) = F(X, \beta) \quad \text{----------} \quad (2)$$

$$prob\ (Y = 0/X) = 1 - F(X, \beta) \quad \text{----------} \quad (3)$$

The set of parameters β reflects the impact of changes in *X* on the probability. In this case what interests us is the marginal effect of explanatory variables on the probability of being default.

Both Probit and Logit model which are Linear Probability Models (LPM) are commonly well -established approaches in the analysis of binary choices (Gujarati, 2004). Whether to use Logit or Probit is a matter of computational convenience. Probit and Logit models are different due to the specification of the distribution of the error terms as Logit model assumes that the underlying distribution of the error terms is logistic while Probit assumes the distribution to be normal. But both are almost converges to each other with increase in sample size. The Logit model has been widely used in many fields, including Economics. Hosmer and Lemeshew (1989) pointed out that a Logit model has got advantage over others in the analysis of dichotomous outcome variable in that it is extremely flexible and is easily used model from mathematical point of view and results in a meaningful interpretation.

Thus, owing its advantage this study used binary Logit model. The model enable us the determination of those factors affecting loan repayment performance of rural householders in the study area. In the study rural households are classified as defaulter and non - defaulter based on their ability to repay their debt**.** Accordingly, the cumulative logistic probability model is specified as follows:

Following Gujarati (2004), the Logit model, for binary choice, variable Y_i takes value 1 $(Y_i = 1)$ if the household is default, $Y_i = 0$ $(Y_i = 0)$ otherwise. The Probability of being default is a function of Z_i. Where $\mathbf{Z_i = \alpha + \beta_i X_i}$

Following the same author the logistic model could be written in terms of the odds ratio and log of odds ratio, which enable one to understand the interpretation of the coefficients. In this study, the odds ratio is the ratio of the probability that a household would default (P_i) to the probability that a household would be non-defaulter ($1-P_i$).

$$(1 - \mathrm{Pi}) = \frac{1}{1+e^{zi}} \quad \text{----------} \quad [4]$$

$$\left(\frac{Pi}{1-Pi}\right) = \frac{1+e^{zi}}{1+e^{-zi}} = e^{zi} \quad \text{----------} \quad [5]$$

Therefore,

$$\left(\frac{Pi}{1-Pi}\right) = \frac{1+e^{zi}}{1+e^{-zi}} = e^{(\alpha+\sum\beta iXi)} \quad \text{----------} \quad [6]$$

Taking the natural logarithm of equation (4)

$$Y_i = \ln\left(\frac{\mathrm{Pi}}{1-\mathrm{pi}}\right) = \alpha + \sum_{i=1}^{k} \beta_i X_i \quad \text{----------} \quad [7]$$

$$Y_i = \alpha + \sum_{i=1}^{k} \beta_i X_i + \mu_i \quad \text{----------} \quad [8]$$

Where: K=the number of explanatory variables; Xi= vector of independent socio-demographic, socio-economic and institutional variables of households and µ=the error term of the model. For continuous variables, the marginal effect is the probability change in response to an increase in the value of the independent variable by one evaluated at the mean value

VARIABLES AND THEIR ASSUMPTIONS

Dependent Variable: The dependent variable of this study is loan repayment of the rural household. It is a binary or dichotomous variable representing the payment status of households.

Independent Variables: It is hypothesized that households' loan repayment decision (status) at any time is influenced by the combination of various factors. This includes both dummy and continuous variables such as: household characteristics, socioeconomic characteristics and institutional characteristics in which the borrowers operate. The variables expected to affect the loan repayment performance are summarized in table 1.

TABLE 1: DEFINITION OF THE INDEPENDENT VARIABLES INCLUDED IN THE MODEL AND THEIR EXPECTED SIGN

Variable	Description	Type	Unit of measurement	Expected sign
Sex	Sex of the borrower	Dummy	1 if the borrower was male and 0 otherwise.	+/-
Age	Age of the borrower	Continuous	Age in number of years	+
Family size	Household size of the borrower	Continuous	Number of the family members	_
Education	Educational Level of the borrower	Continuous	The level of formal education	+
Land Size	Land Holding size of the borrower	Continuous	Total land owned per household in hectare	+
Oxen	Ownership of Oxen	Continuous	Total number of Oxen owned per the borrower.	+
Loan size	Amount of loan	Continuous	Amount borrowed by the borrower.	_
Interest rate	Interest rate	Continuous	Amount of interest rate paid by household for the borrowing	_
Off-farm Income	Off farm income of borrower	Continuous	Amount of additional income that the borrower gets outside of farming activities	+
Irrigation	Whether the borrower use irrigation or not	Dummy	1 if the household has access to irrigation , 0 otherwise	+
Access to Ext.	Access to Extension services	Dummy	1 if the household has access to agricultural extension, 0 otherwise	+
Training	Training before loan	Dummy	1 if the household has got training before loan , 0 otherwise	+
Supervision	Loan supervision	Dummy	1 if the household has been supervised, 0 otherwise	+
Loan Diversion	Loan diversion is a money spent on festival or other nonproductive use	Continuous	Amount of money spent on festival	_

RESULT AND DISCUSSION

DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF HOUSEHOLD

The households' profile and their demographic and socio-economic characteristics are summarized in table 2. It was hypothesized that household size will have a negative influence on the households (borrowers) loan repayment performance. As the number of household size increases the family need for basics good and services will increase proportionally and this may induce the borrowers to divert part or all of the borrowed money towards fulfilling their basic needs or the need of their family members instead of using the money for more productive use. This may reduce the households (borrowers) loan repayment performance. As expected the household size of the borrowers who have defaulted on their loan is higher than those borrowers who have successfully repaid their loan and this difference is statistically significant at 1% of significance level (table 2)

TABLE 2: HOUSEHOLDS' SOCIO-ECONOMIC CHARACTERISTICS AND THEIR LOAN REPAYMENT STATUS (continuous variables)

	Non-defaulter (№=117)		*Defaulter (№=74)*		*p- value* (chi2)
Continuous Variables	*Mean*	*SD*	*Mean*	*SD*	
Family size	*5.6*	*2.3*	*7.7*	*1.8*	*9.037***
Age of the HH	41.2	10.9	37.8	8.5	*0.019****
Land size in ha	*2.3*	*1.1*	*1.8*	*089*	*0.015***
Livestock holding (TLU)	5.6	*0.9*	*3.21*	*1.5*	0.431
Oxen Ownership in Number	2.0	0.9	1.3	0.58	0.000***

Source: Own Survey Data, 2013

Note: ***, ** and * Significant at 1%, 5% and 10% significance level

There is ongoing debate among scholars about the relationship between age of borrower households and their loan repayment status. Some argue that as the age of the borrower increases, she/he become more knowledgeable and experienced in managing her/his scare resources. In other words, as the age of the household increases her or his experience about farm resource and risk management increases. As a result the loan repayment performance improves with the age of the borrower. In contrary to this, some scholars argue that even though as age increases experience and wealth may accumulate. However, due to natural physical limit, individuals' ability to undertake farm activities and more physical labor will decrease. This may reduce the households' ability to generate more income and repay their debt. Thus, according to this group, household age and their loan repayment performance expected to be inversely related. However, table 2 revealed that as age of borrowers increase their loan repayment performance seems increasing. The average age of non-defaulters' is higher (43.2) than that of defaulters which is an average of 37.8 years. The statistical test confirmed that there is statistically significance difference between the mean ages of the two groups

Land is a key asset for rural households specifically for farmers to sustain and make their livening. Land is also the major sources of income for the household in the study area. If there is large arable land owned by a household, they might get enough amount of agricultural produce which will be enough to support the whole family members. Thus, it was hypothesized that households who own more arable land are less likely to default on their loan. The mean farm size of non-defaulters and default households is 2.3ha and 1.8ha, respectively. The overall mean farm size of the sample households is about 2.1ha. The difference in farm size between the two groups is statistically significant at 5% significance level. It means that, the households with smaller land size are most likely default on their loan than those having relatively larger farm size.

Another farm input that may affect the level of farm income is the number of oxen owned by rural households. Farmers with large number of oxen expected to enjoy higher level of crop production and hence improved level of farm income. This in turn expected to improve the loan repayment performance. The average number of oxen owned by the non-defaulters is relatively higher (two oxen) than the defaulters who own only a single ox. This difference in the oxen ownership is statistically significant at 1% significance level.

Table 3 presents the socio-economic characteristics of households in terms of categorical variable. The sex profile of respondents shows that majority (58.6%) of the clients of the Microfinance Institutions (MFIs) are female clients. It seems that the larger proportion (62.2%) of defaulters is also female clients as compared to their male counterparts which represent 37.8% of the total defaulters. However, the chi-square test does not prove any statistically significant difference between male and female clients in their loan repayment performance.

Education level of households in the study area was also assessed to see how it will affect the loan repayment performance of households and is described in table 4.3. It can be concluded that most of the clients of the MFIs in the study area are illiterate. Literate households represent only about 27% of the households. Education is an important factor that enables households to properly utilize the borrowed fund and hence improving their repayment performance. From the total borrowers who have defaulted on their debt, 81% of them are illiterate as compared to 19 % who are literate and can at least read and write. From this it can be argued that those households who are literate have better loan performance than their counter part illiterate households. The difference in the loan performance between the two groups is also statistically significant at 1% significance level.

TABLE 3: HOUSEHOLD LOAN REPAYMENT STATUS AND HOUSEHOLD CHARACTERISTICS (Categorical variables)

Categorical Variables		Non-defaulter		Defaulter		χ^2	P-value
		Frequency	Percent	Frequency	Percent		
Sex	Female	66	56.4	46	62.2	0.0225	0.881
	Male	51	43.6	28	37.8		
Educational Status	Literate	38	32.5	14	19		
	Illiterate	79	67.5	60	81	7.8818***	0.005
Fertilizer Utilization	Yes	104	88.9	55	74.3	1.3548	0.244
	No	13	11.1	19	25.7		
Access to Extension service	Yes	82	70	38	51.4	1.32	0.251
	No	35	30	36	48.6		
Use of Irrigation	Yes	14	12	8	10.8	0.900	0.764
	No	103	88	66	89.2		
Loan Supervision	Yes	98	83.8	55	74.3	2.1592**	0.043
	No	19	16.2	19	25.7		
Training before loan	Yes	44	37.6	18	24.3		
	No	73	62.4	56	75.7	1.0981	0.2709

Source: Own Survey Data 2013

Note: ***, and ** represents significant at 1% and 5% significance level

Fertilizer use supposed to increase farm income through its effect on farm productivity. This in turn expected to increase the probability loan repayment. About 83.25% of the households in the surveyed area have applied fertilizer in their farms in previous production season. Surprisingly, most of the households (74.3%) who have defaulted on their loan are those who applied fertilizer to their fields as a farm input. However, the chi-square test revealed the fact that there is no association between the fertilizer use and the households' loan performance. This implies that fertilizer utilization in the study area could not help to discriminate households in to non-default and default groups. This might be due to the fact that the price of fertilizer is expensive for rural poor households which may result in reducing the rate applied in their fields. In appropriate rate of fertilizer application may not bring significant improvement in the crop yield. Similar finding was obtained by Teklay and Solomon (2013), who have observed during survey that commonly fertilizer is sold in the local market just like salt or other grains did. Meaning, farmers who have received[9] fertilizer took it to the local market and sale it so as to smooth their daily consumption. This might affect the rate of application and time of application of fertilizer which in turn reduces the farm return from fertilizer.

Loan supervision by the loan officer is an important activity that has to be implemented on regular basis to minimize the problem of moral hazard and thereby ensuring the productive use of the loan by the rural households. As it can be seen above in table 3, most of the respondents (80%) were officially supervised on their loan utilization and their repayments schedule**.** It seems that there is an association between loan repayment performance and loan supervision in the study area. This association is statistically significant at 5% level of significance indicating that those households who are periodically supervised are most likely perform better than those who are not supervised at all.

LOAN REPAYMENT PERFORMANCE

The respondents' loan repayment performance as of the date of data collection - April 2013 is presented in table 4. The loan repayment performance is a categorical variable. Most of the householders were not fully repaid their loans timely. During this study out of the total 191 interviewed householders' 117 (61.3 %) respondents' have fully repaid their loan on time, and the remaining 74 which makes 38.7% of the respondents have defaulted on their loan.

TABLE 4: LOAN REPAYMENT PERFORMANCE OF RURAL HOUSEHOLDS

Repayment status	Frequency	Percent	Cumulative (%)
No-default	117	61.3	61.3
Default	74	38.7	100
Total	191	100	

Source: Compute based on selected MFIs.

During the survey among defaulters, 46 which is 62 % of them were complete defaulters while 38 % of them are technical defaulters who paid total interest rate and between 30-50% of the principal. This figure is very high by any standard and need to be addressed if the MFIs have to continue in their provision of financial services to the needy rural households in the study area (Dodota Woreda). Table 5 presents loan default rate by MFIs.

TABLE 5: DISTRIBUTION OF DEFAULTERS BY MFIs

		OCSSC		KSCUC	
Borrowing rate of interest		13%		15%	
		Frequency	Percent	Frequency	Percent
Repayment status	Default	17	25.8	57	45.6
	No-default	49	74.2	68	54.4
	Total	66	100	125	100

Source: Survey data (2013)

As it can be observed in the above table (table 5), the loan default rate between the two MFIs, OCSSC and KSCUC is quite different. The OCSSC loan collection performance is better than its counterpart KSCUC. About 74.2% of OCSSC clients have fully repaid their loan as compared to KSCUC which has collected the loan from only 25.8% of its clients. From this it can be argued that among the MFIs operating in the study area OCSSC loan collection performance is much better. The possible reason for the difference in the loan recollection performance of the two MFIs can be due to difference in the lending interest rate. The average interest rate charge by OCSSC is 13% which is less by 2% than the amount charged by KSCUC (15%).

DETERMINANTS OF RURAL HOUSEHOLD LOAN REPAYMENT PERFORMANCE- LOGIT ESTIMATE

So far the paper has tried to characterize rural households based on different demographic and socio-economic factors. However, in this section attempts have been shifted towards explaining the main demographic and socio-economic determinants of rural household's loan repayment performance which is beyond the scope of descriptive analysis and other indices.

Pair wise correlation matrix was employed to test for the existence of the problem of multicollinearity. Accordingly, it is found that there is no serious multicollinearity problem among the explanatory variables. To avoid the effect of heteroscedasticity robust logistic regression was employed as it handles the effect of heteroscedasticity.

[9] In effort to bust agricultural productivity and encourage farmers to apply fertilizer, the local government will distributed fertilizer to the farmers on credit bases.

In addition, various goodness of fit tests validate that the model fits the data well. The LR chi-square test robustly rejects the null hypothesis that all slope coefficients are simultaneously equal to zero. This implies that the model correctly predicted the observations. The Hosmer-Lemeshow[10] test of goodness of fit also fails to reject the null hypothesis that the model fits the data well. Hence, the Hosmer and Lemeshow test statistic shows a significant association between the observed and the model's prediction of a household's loan performance status. The count R^2 for the binary Logit model is found to be 90.00 percent implying that the Logistic model correctly predicted 90 % of the total sample households. Thus, it can be concluded that the binary Logit model under consideration fits the data very well and fairly.

After ensuring the validity of basic assumptions and the explanatory power of the model, it is fitted to the binary Logit model which is depicted in table 6. In the estimation result of Logit model the response variable-rural household loan repayment status regressed on different demographic and socio-economic correlates which are expected to have due influence on households' loan repayment performance in the study area.

In this binary Logit model, fourteen explanatory variables are included of which eight variables are found to be significant determinant factors of rural household loan repayment performance in the study area. These include, age, sex, household size number of oxen owned, land holding size, access to extension service, loan supervision, interest rate and training before loan. The remaining six explanatory variables were found to have no significant influence on loan repayment performance of the rural households in Dodota Woreda.

TABLE 6: LOGIT REGRESSION RESULT FOR FACTORS AFFECTING RESPONDENT'S LOAN REPAYMENT PERFORMANCE

Finished Repayment	Coef.	Robust Std. Err.	P -value	Marginal Effect (dy/dx)
Age	.0866844***	.0266094	0.001	0.016971
Sex	.8348492*	.4670688	0.074	-0.16345
Education	.3852951	.4664572	0.409	0.075433
HH Size	-.5304126***	.1158594	0.000	-0.10384
Land size	.6095041**	.2957256	0.039	0.119328
Fertilizer use	-.0003767	.0080806	0.963	-7.4E-05
Access to Ext	.3807655**	.1669607	0.023	0.07455
Oxen	.6820004**	.3396219	0.045	0.133521
Off-farm Income	-.1151236	.6318846	0.855	-0.02254
Loan Size	-.0001386	.0004181	0.740	-2.7E-05
Loan Supervision	.8015279	.5566085	0.107	0.156922
Training	.7141108**	.4997868	0.051	0.13981
Interest Rate	-99.06652***	27.44141	0.000	-19.398
Money spent	.0008125	.0030354	0.789	0.0002
Logistic regression **Log likelihood = -74.089439**		**Number of obs = 190** **LR chi2(15) = 103.97** **Prob > chi2 = 0.0000** **Count R2 = 90.00**		

Source: STATA output based on survey data

Where, ***, **,* represent level of significance at 1%, 5% and 10% respectively

Age of Household: The estimated parameter for age of the rural household head has a positive and statistically significant impact at one percent level of significance on the rural households' loan repayment performance. This implies that as age of households (borrowers) increase the probability of loan repayment will increase as well and vice versa. The marginal effect which is 0.0169, implying that as the age of the borrower increases by one more year the probability of loan repayment in full and in time increases by 1.6 percent assuming other things are remain unchanged. This finding is consistent with the findings of Okorie (2004) in Nigeria who has reported that age is positively and significantly affects loan repayment performance. However, the finding is inconsistent with the findings of Kashuliza (1993) in Tanzania who has identified that age of the borrower to inversely affect the loan repayment performance in his study area.

Sex of Household: The study has tried to see to what extent being male or female affects the loan repayment of clients in the study area. Sex of the respondent was found to positively and significantly affect the probability of full repayment of loan at ten percent level of significance. Meaning that male borrowers seems to have low probability of default than the female borrowers in Dodota Woreda (study area). Possible explanations for females poor loan repayment performance may be that female borrowers most likely to divert the borrowed fund to household consumption than their male counterparts as they shoulder more responsibility in managing their households expenditure.

Household Size: Household size has been identified to have a significant and negative effect on farmer's loan repayment performance in the study area. This is consistent with the findings of Oladeebo (2008) in Nigeria and Kashuliza (1993) in Tanzania, who all concluded that the family size of the borrowers is one of the significant factor affecting the loan repayment performance of households in their respective study area. Thus, it can be concluded that borrowers with relatively large family size are most likely default on their loan as the result is statistically significant at one percent significant level. The marginal effect shows that a unit increase in household size, will increase the probability of loan default by around 10 % in the study area, other things remain the same.

Land size: As expected, farm size was found to be positively associated with full recovery of loan and it is statistically significant at five percent level of significance. The positive coefficient implies that farmers with relatively larger holdings have higher probability to fully repay their loan. A unit increase in land holding size will increase the probability of full repayment nearly by 12%.

Access to Extension Service: Consistent with researcher's expectation, the coefficient of extension service was found to be positive and significant factor affecting the loan repayment performance of households in the study area. Rural household (borrowers) who do not have access to extension services most likely default on their loan than their counterpart borrowers who have access to extension services. This can be explained by the fact that through extension service households will get periodic training and advisory services on the use fertilizer, improved seeds and other agricultural technologies. Such services enable participants to improve their farm productivity. Increased farm productivity will ultimately increase farm income which will results in improving households repayment capacity.

Number of Oxen: It was assumed that the households' farm productivity increase as the number of oxen owned increases and hence enhances the households' loan repayment capacity. In accordance with the expectation the number of oxen owned by household found to be crucial for farmers' loan repayment performance. It is positively and significantly associated with the loan repayment performance. The marginal effect depicts that a unit increase in number of oxen owned by the borrowers, the probability of full repayment will increase by about 13% other things remain unchanged.

Training before Loan Provision: Consistent to the researcher's expectation, training before loan which is a useful instrument for credit repayment performance is positively related to credit repayment performance of rural households. The result was found to be significant at five percent level of significance. This result is also consistent with the theoretical framework and empirical findings of different researches conducted in different countries. Similar results were obtained by Olagunju (2007), and Okorie (2004), in Nigeria, and Jama and Kulundu (1992) in Kenya.

[10] Under the Hosmer- Lemeshow goodness of fit , the null hypothesis is that the model fits data well and hence, failing to reject it means the model fits the data well

Interest Rate: Interest rate is cost of borrowing and it is expected to negatively affect the repayment ability of borrowers. As expected the interest rate that the borrowers has to pay for their borrowing had a negative and significant effect on the probability of fully loan repayment in the study area. This implies, that higher borrowing rate, most likely increase the probability of default of the rural households. The marginal effect of interest rate revealed the fact that, other things held constant a unit increase in interest rate, will increase the probability of default by nearly 14% and vice versa. The finding was also consistent with the finding of Arifujjaman (2007).

CONCLUSION

Poverty still remained a daunting challenge to developing countries that threaten their development effort. In deed it is a problem for almost all sub-Saharan African countries irrespective of their level of development and can be observed in many forms. It causes can be different. It may be due to lack of resources, lack of coping capacity, lack of basic human capabilities, lack of institutional defenses or in extreme cases it can be due to lack of all of them. In a wider sense, it may be a combination of economic, social and political deprivations. To address this problem different strategies have been implemented by developing countries. Recently Microfinance (MF) has been given due weight as one of the means to fight against poverty. MF programs include extending small loans to poor people aiming at enhancing self-employment projects that generate income to improve the living conditions of the poor and hence alleviating poverty. Ethiopia as part of the developing countries has adopted MF programs and many MFIs are providing credit services to both rural and urban poor households.

In Ethiopia improving access to financial services particularly in rural areas are regarded as one of the development strategies to eradicate poverty in developing countries. However, the success and sustainability of financial service provision of credit is constrained by loan repayment performance of the potential borrowers. Identifying major factor affecting the repayment performance of borrowers is a first step towards suggesting remedial measures. It was with this sprit this study has tried to assess and analyze the loan repayment performance of rural householders of Dodota Woreda, in Oromia Regional state of Ethiopia based on data collected from 191 respondents.

The study documented that the households in the study area are characterized by a low loan repayment performance where about 61 % respondents fully repaid their loan while 39% of them defaulted on their loan. This figure is very high by any standard and is negatively affecting the operation of MFIs. Thus, it is imperative to identify the major factors contributing for such high loan default rate.

Interest rate paid by borrowers happens to be higher particularly when the borrower is poor rural households. It is negatively affecting the loan repayment performance of households and is responsible for increasing the default rate in the study area. It was observed that the MFIs lending rate is higher than the commercial banks' lending rate. One can argue that high borrowing rate is the characteristic of small loan. However, if the rural financial service provision has to sustain it is imperative to improve the loan repayment performance of potential borrowers. One way is taking measures that reduce the rate of borrowing by MFIs through improved efficiency of loan service so as to decrease the borrowing interest rate. The reduction of borrowing interest rate is further justified by the empirical finding which showed that a unit decreases in the rate of interest rate leads to a decrease a defaulting rate by almost 10%.

It was observed that the average family size of the households who have defaulted on their loan is relatively higher (around 7 family members). The empirical finding document that households with relatively large family size are the one who most likely default on their loan and this calls for concerted effort to educate the rural community on modern family planning. This is to say that family planning services need to be considered as one of the important rural development strategies to fight poverty in the rural Ethiopia in general and in Dota Woreda in particular.

The study recognized the fact that any factor that affects the farm productivity such as; farm size, agricultural extension services, ownership of oxen and other relevant farm input have a significant impact on the households income and hence on their loan repayment performance. Thus, addressing the issue of farm input and their productivity through improved agricultural extension services need to be considered as a policy measure that improve the loan repayment performance of the rural household.

Provision of financial services to the rural community could be successful in improving the livelihood of rural households if it is accompanied with training before loan provision and regular supervision to ensure the productive use of the fund by the borrowers. Thus, planning and proper implementation of these two activities need to considered as part and parcel of the financial operation of MFIs.

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AN ANALYSIS OF CELEBRITY ENDORSEMENT IN INDIA REGIONAL VS. NATIONAL CELEBRITIES

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ABSTRACT

Celebrity Endorsements, as a part of marketing communication strategy, is used by marketers for their brand. In India also, this strategy is gaining pace. The amazing fact is that each brand when endorsed by a national celebrities at a national level; the same brand is endorsed by a regional celebrity at regional level. A star appeal however needs to be perfectly blended intelligently and strategically to reap the benefits and make brands. This paper highlights the level of awareness of these celebrities at regional level. It also identifies the popularity level of regional and national celebrities. The research revealed that the impact of National (Bollywood) movie starts is more than Regional (Tollywood-West Bengal) movie stars.

JEL CODE
M37

KEYWORDS
Celebrities, National, Popularity, Q Score, Regional.

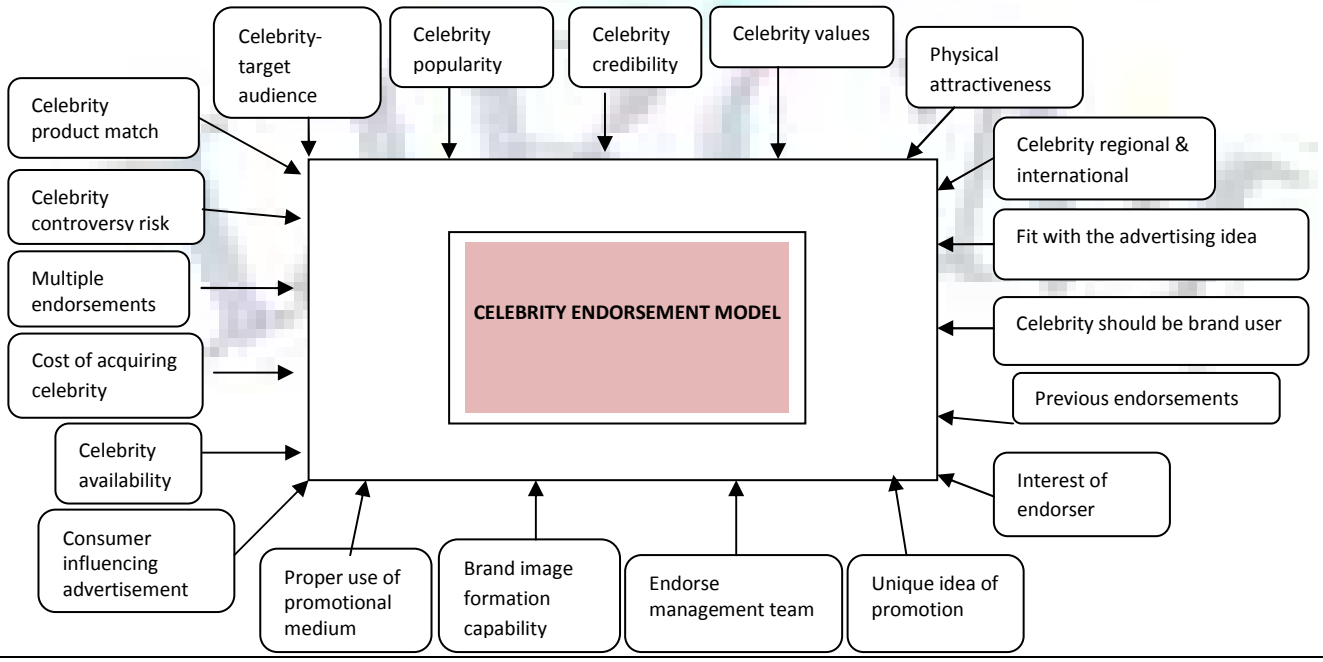
INTRODUCTION

Every business has more or less same product with similar properties. Here, the crucial role of marketer comes. His main challenging task is to mark a presence in the minds of the consumers that will hold the subject's attention and keep them from changing the channel or turning the page. One of the very promising approach for this differentiation strategy is Celebrity Endorsements. Celebrities are those dynamic individuals with likeable and attractive qualities. Celebrities are individuals who enjoys public recognition and who uses this recognition on behalf of a consumer good by appearing with it in an advertisement. (McCracken,1989). Kamins (1989) defines Celebrity endorsers as "an individual who is known to the public for their achievements in the areas other than that of the product endorsed". During the past 100 years, the commercial use of celebrities has evolved from simple cigarette cards to multi-media messages with million dollar contracts (Agarwal & Kamakura, 1995).

A variety of celebrity endorsers have been transformed from a few models and athletes and now encompasses men, women, boys and girls from the world of sports, films, television, radio, music and obscurity (McCracken, 1989). The use of celebrities in marketing communication especially in advertising has been a very common marketing strategy for companies for supporting their brand image. In 1979, celebrities have been used in approximately 16% of all advertisements in United States (Erdogan, 1999). In 2000, the percentage of commercials with celebrity endorsers is estimated at around 25% in the US (Shimp, 2000). Most of the advertisements creatively use the image of celebrities to get the attention of the audience. A celebrity product association can capture a viewer's attention, increase the public awareness, and induce consumers to purchase the product endorsed. The utilization of celebrity endorsement in marketing programmes is far more effective than other types of endorsers like company manager, expert, or typical consumer (Seno & Lukas, 2007).

Mukherjee (2009) had identifies 20 attributes of effective celebrity endorsement. The success of celebrity endorsement is dependent on these 20 factors. These factors basically speak of various parameters that define the suitability of celebrity with the brand he/she is endorsing.

FIGURE 1: 20 ATTRIBUTES OF EFFECTIVE CELEBRITY ENDORSEMENT (Adapted: Mukherjee D., impact of celebrity endorsement on brand image, 2009**)**



MEASURING THE EFFECTIVENESS OF CELEBRITY

Products are more or less similar nowadays. Therefore, the role of celebrities has become more challenging when it comes to endorsement. What matters is the effectiveness of the endorser. There are few models to analyse the effectiveness of the celebrities. These are:

- **THE MULTIPLIER EFFECT FORMULA**

Where, S= successful brand
E= effective product
D= distinctive identity
AV= added values

S = E*D*AV
(MULTIPLIER EFFECT)

For a brand to be successful, it needs to have a proper combination of effectiveness of the product with certain Distinctive Features, to which the celebrities add values with their presence.

- **FRED ANALYSIS**: It stands for **F**amiliarity, **R**elevance, **E**steem and **D**ifferentiation. This analysis provides guidelines when selecting a spokesperson. It measures the effectiveness by taking into consideration:
  - firstly, the target market must be aware of the person
  - secondly, there should be a meaningful link between the product endorsed and the endorser
  - thirdly, consumers should have an utmost respect for the celebrity because of their distinguished careers
  - Lastly, target consumers must see the endorser above all others.
- **THE Q-SCORE METHOD**: This technique is usually used by companies to select the right celebrity for the product endorsement. It also enables the marketers to determine the ranking of the celebrities as per consumer's choice. It measures the credibility, believability, popularity and likeability of a celebrity. It is calculated by dividing percentage of respondents who have indicated the celebrity as one their favourite, i.e., popularity measure by the percentage of respondents who indicate that they heard of that celebrity, i.e., familiarity measure. However, the most accepted method to measure the effectiveness of celebrity endorsement is Q-Score method.

CELEBRITY ENDORSEMENT IN INDIA

In India, Celebrity endorsement started gaining prominence since 1980's. The introduction of television added a variable effective medium of communication. Every region has its own celebrity system. Thus, a celebrity can easily and broadly be divided into three parts- global celebrity, national celebrity and regional celebrity. Global celebrity is one who is known all over the globe, or more than one country like Michael Jackson or sport stars. National celebrities as the name suggests are those whose recognition are restricted to a particular nation. Movie stars are generally national celebrities. Last but not the least, Regional Celebrities are those who belong to a particular region of a country and are not known or comparatively less known in other regions.

In India, we have a rich culture of diversity. Its every state has its own language, and has its local regional film celebrities. These celebrities play a very important role as brand ambassadors for certain brands in their specific regions. A single brand when endorsed in India by a national celebrity, the same brand is endorsed in other regions by their regional celebrity.

So, brands are now shifting themselves by localizing their campaigns to capture the local market. They are changing their attitude of 'one size fits all', and trying to adapt themselves in every region. In southern India, regional celebrity endorsement is very successful (Rao, 2007).

Some of the smarter brands have realised that they need a local brand ambassador if they have to improve the brand connect. For this, they are having a national brand ambassador and a separate regional ambassador to appeal to their local consumers.

TABLE 1: SHOWING THE DIFFERENT NATIONAL AND REGIONAL BRAND ENDORSERS FOR THE SAME BRAND

Brand	National brand ambassador (or for northern belt)	Regional or South India brand ambassador
Fair and Handsome	Shahrukh Khan	Surya
Pepsi	Ranbir Kapoor	Ram Charan Tej
Kurkure	Juhi Chawla	Simran
Navratna Oil	Amitabh Bachchan	Suriya, Mahesh Babu
Tata Indicom	Kajol	Trisha
Fanta(previous campaign)	Rani Mukherjee	Trisha
Perk (previous campaign)	Preity Zinta	Trisha
Idea Cellular	Abhishek Bachchan	Siddarth
ThumsUp	Akshay Kumar	Mahesh Babu
Vivel Shampoo	Hrithik Roshan	Trisha
7Up	MallikaSherawat (previously)	Allu Arjun

Source: Celebrity endorsements in South India – the next 'Big thing' by Allu Shirish. (part-I) Retrieved on 23/02/2012 from http://www.indiaglitz.com/channels/telugu/article/56031.html

Celebrity branding both in regional and national level is done nowadays to overcome this problem, wherein a celebrity uses his status to promote a product, service or charity.

SCOPE AND SIGNIFICANCE OF THE STUDY

In today's trend of advertising, we witness the usage of celebrity endorsement is a real strategy to win the race. The association of brand to celebrity is very crucial aspect. In a country like India, which is heterogeneous by nature, there is a need of research about the popularity of regional and national celebrities, which leads to our main objective of the study. By the help of such an analysis, a marketer can develop his strategy accordingly.

OBJECTIVE OF THE STUDY

The objectives of this study are as follows:

1. To determine the level of awareness of regional and national celebrities
2. To compare the popularity of these celebrities as brand endorsers.

HYPOTHESES

Popularity measure of a national celebrity as compared to other types of celebrities is usually higher because of their wider reach. On the basis of this, I formulate following hypotheses-

H1: popularity score of national celebrity is higher than a regional celebrity.

DETAILED METHODOLOGY

The methodology comprises of both primary and secondary research.

The study has been carried out in Kolkata city (capital of West Bengal). Secondary research was undertaken to prepare a list of 20 celebrities consisting of 10 national and 10 regional celebrities who are endorsing at least one brand and who have achieved substantial name and fame. The Overall rankings of 20 celebrities are found using 'Q' score technique.

SAMPLE SIZE: A sample size of 100 individuals, both male and female in the age group of 19-39 years was considered. The consumer of this age group is majorly student, so universities/colleges in the Kolkata were targeted.

SAMPLING TYPE*:* Judgemental and convenience sampling is done to select the respondents.

DATA COLLECTION INSTRUMENT*:* Data was collected by getting a questionnaire filled from the universities of the said city. The questionnaire was divided into two (2) parts. In the first part respondents were given a list of 10 regional and10 national celebrities followed by series of related questions. In the second section, questions related to their demographics were asked. This part was constituted for the classification purpose only.

DATA ANALYSIS AND INTERPRETATION

Primary data collected during the course of the study was analysed using simple percentages. Then 'Q' scores of the selected celebrities were found out to determine the awareness level in terms of Familiarity, Suitability and Popularity of the selected celebrities and determining their potential as probable brand endorser.

FAMILIARITY MEASURE: A celebrity is said to be familiar if he/she is correctly identified by the respondent. If not so, the respondent is said to be unaware about the celebrity.

The study shows that all the National (Bollywood) Celebrities have 100% familiarity among the respondents. However, regional celebrity Payel Sarkar has least familiarity among respondents, i.e., 94%. Other celebrities namely Dibyendu Mukherjee, Soham Chakraborty, Koel Mallick, Ananya Chatterjee have 97, 99, 96 and 99 score respectively.

TABLE 2: FAMILIARITY SCORE OF THE CELEBRITIES

S.No.	Name of Celebrities	No. of familiar Respondents	Percentage (%)
1	Dev	100	100
2	Victor Banerjee	100	100
3	Pooja Bose	100	100
4	Dibyendu Mukherjee	97	97
5	Soham Chakraborty	99	99
6	Mimi Chakraborty	100	100
7	Jeet	100	100
8	Koel Mallick	96	99
9	Payel Sarkar	94	96
10	Ananya Chatterjee	98	99
11	Ranbir Kapoor	100	100
12	Salman Khan	100	100
13	Amitabh Bachchan	100	100
14	Akshay Kumar	100	100
15	Shahrukh Khan	100	100
16	Deepika Padukone	100	100
17	Priyanka Chopra	100	100
18	Sonam Kapoor	100	100
19	Katrina Kaif	100	100
20	Kareena Kapoor	100	100

SUITABILITY MEASURE: Respondents were asked to rate the Celebrities depending on their suitability of the brands endorsed by them.

The celebrity who scored highest in suitability measure percentage is Amitabh BAchchan (82%) followed by Dev (81%), Ranbir Kapoor (80%), Katrina Kaif (79%), and Salman Khan (77%).

TABLE 3: SUITABILITY SCORE OF THE CELEBRITIES

S.No.	Name of Celebrities	Degree of Suitability of Celebrity image with the brand		
		High	Medium	Low
1	Dev	81	7	12
2	Victor Banerjee	34	51	15
3	Pooja Bose	63	4	33
4	Dibyendu Mukherjee	28	57	15
5	Soham Chakraborty	53	34	13
6	Mimi Chakraborty	57	39	4
7	Jeet	67	24	9
8	Koel Mallick	74	17	9
9	Payel Sarkar	72	18	10
10	Ananya Chatterjee	71	9	20
11	Ranbir Kapoor	80	13	7
12	Salman Khan	77	5	18
13	Amitabh Bachchan	82	11	7
14	Akshay Kumar	33	62	5
15	Shahrukh Khan	59	11	30
16	Deepika Padukone	75	6	19
17	Priyanka Chopra	69	14	17
18	Sonam Kapoor	20	77	3
19	Katrina Kaif	79	13	8
20	Kareena Kapoor	43	52	5

POPULARITY MEASURE: Popularity score of the celebrity is measured by the respondents who have rated the celebrity as "One of my Favourite". Popularity Percentage is calculated by the number of respondents who have rated the celebrity as one of my favourite divided by the number of respondents who are familiar with the celebrity and then multiplying the figure by 100.

The celebrity who scored highest in popularity measure percentage is Amitabh Bachchan (67%) followed by Salman Khan (63%), Shahrukh Khan (60%), Dev (58%) and Ranbir Kapoor (54%). The study shows that 8 out of top 10 popular celebrities are national (Bollywood) celebrities. Only 2 regional celebrities got place in top 10 rankings of popularity measure.

TABLE 4: POPULARITY SCORE OF THE CELEBRITIES

S.No.	Name of Celebrities	Popularity Score	Percentage
1	Dev	58/100	58%
2	Victor Banerjee	14/100	14%
3	Pooja Bose	26/100	26%
4	Dibyendu Mukherjee	9/100	9%
5	Soham Chakraborty	19/100	19%
6	Mimi Chakraborty	21/100	21%
7	Jeet	28/100	28%
8	Koel Mallick	42/100	42%
9	Payel Sarkar	30/100	30%
10	Ananya Chatterjee	33/100	33%
11	Ranbir Kapoor	54/100	54%
12	Salman Khan	63/100	63%
13	Amitabh Bachchan	67/100	67%
14	Akshay Kumar	12/100	12%
15	Shahrukh Khan	60/100	60%
16	Deepika Padukone	39/100	39%
17	Priyanka Chopra	34/100	34%
18	Sonam Kapoor	4/100	4%
19	Katrina Kaif	51/100	51%
20	Kareena Kapoor	36/100	36%

CALCULATING 'Q' SCORE: It is the Quotient score. It is generally used by firms to understand the popularity scores of the celebrities. It is measured by dividing popularity score percentage by familiarity score percentage, and then multiplying it by 100.

$$Q\ SCORE = \frac{POULARITY\ \%}{FAMILIARITY\ \%} X100$$

TABLE 5: Q SCORES OF THE CELEBRITIES

S.No.	Name of Celebrities	Familiarity		Popularity		Q Score
		Score	Percentage	Score	Percentage	
1	Dev	100	100	58/100	58%	58
2	Victor Banerjee	100	100	14/100	14%	14
3	Pooja Bose	100	100	26/100	26%	26
4	Dibyendu Mukherjee	97	97	9/100	9%	9.28
5	Soham Chakraborty	99	99	19/100	19%	19.2
6	Mimi Chakraborty	100	100	21/100	21%	21
7	Jeet	100	100	28/100	28%	28
8	Koel Mallick	99	99	42/100	42%	42.42
9	Payel Sarkar	96	96	34/100	34%	35.42
10	Ananya Chatterjee	99	99	33/100	33%	33.33
11	Ranbir Kapoor	100	100	54/100	54%	54
12	Salman Khan	100	100	63/100	63%	63
13	Amitabh Bachchan	100	100	67/100	67%	67
14	Akshay Kumar	100	100	12/100	12%	12
15	Shahrukh Khan	100	100	60/100	60%	60
16	Deepika Padukone	100	100	39/100	39%	39
17	Priyanka Chopra	100	100	30/100	30%	30
18	Sonam Kapoor	100	100	4/100	4%	4
19	Katrina Kaif	100	100	51/100	51%	51
20	Kareena Kapoor	100	100	36/100	36%	36

FINDINGS

The analysis of the Q Score signifies that higher the Q score of the celebrity, higher will be the popularity and awareness among the respondents. It also shows that the celebrities with high score are able to communicate the message correctly and also establishes a connection in the mind of the target consumer. Through this analysis, table 4 has been generated. It clearly shows that among the selected celebrities from national as well as regional level, Amitabh Bachchan has the highest score (67%) followed by Salman Khan (63%), Shahrukh Khan (60%), Dev (58%), Ranbir Kapoor (54%). Among the top 10 celebrities, 6 places have been captured by national celebrities. However, the remaining 4 were regional celebrities. The lowest Q score are of Dibyendu Mukherjee (9%) and Sonam Kapoor (4%). It clearly revealed that the National (Bollywood) celebrities are popular than the regional celebrities.

TABLE 6: RANKING OF CELEBRITIES AS PER Q SCORE

S.No.	Name of Celebrities	Q Score	S.No.	Name of Celebrities	Q Score
1	Amitabh Bachchan	67	11	Ananya Chatterjee	33.33
2	Salman Khan	63	12	Priyanka Chopra	30
3	Shahrukh Khan	60	13	Jeet	28
4	Dev	58	14	Pooja Bose	26
5	Ranbir Kapoor	54	15	Mimi Chakraborty	21
6	Katrina Kaif	51	16	Soham Chakraborty	19.19
7	Koel Mallick	42.42	17	Victor Banerjee	14
8	Deepika Padukone	39	18	Akshay Kumar	12
9	Kareena Kapoor	36	19	Dibyendu Mukherjee	9.27
10	Payel Sarkar	35.42	20	Sonam Kapoor	4

CONCLUSION

Featuring Celebrities in advertising is such a marketing strategy that will continue for a very long. Which celebrity should be used, this question has to be analysed properly when it comes to a diversified place like India. Celebrities get the viewers' attention, but whether they work to sell the product depends on proper celebrity casting. The use of celebrity for brand promotion is increasing day by day but it cannot be treated as an assured strategic tool to enhance market share, demand of the product or even profit because it mainly depends upon suitability of celebrity with a product and brand as well. Further, celebrities with least familiarity and popularity rates with consumers are not able to establish a meaningful connection with audiences. The Q score technique provides a solution to find the level of acceptability of the celebrity by the audience. From the study it is evident that the celebrities who are able to make right association with their brands endorsed are able to make the right connect with the target audience, thereby communicating the message more effectively. Further, it was revealed from the data that impact of bollywood stars is higher than the Regional Stars.

SCOPE FOR FURTHUR RESEARCH

This study compares two regions of India. Similarly other regions can also be compared. Moreover, to give international appeal to such a kind of study, comparison between national and international celebrities can also be done. Such a kind of study will help the marketers to understand the perception of customers regarding different endorsers to a same brand in a single market arena. Moreover, it is right to say that when the decision regarding the celebrity endorsement is planned intelligently and strategically by having a proper focus on the market, then only a marketer will be able to reap the benefits and build a successful brand.

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TERRITORIAL ACCOMMODATION OF ETHNIC CONFLICT AND ITS NEXUS WITH POST CONFLICT STATE BUILDING AND PEACE

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ABSTRACT

The main objective of this paper is to try and find, in the literature, arguments- pro and con, insights on specific modalities and their risks and benefits, constraints, best practices and lessons learned whether territorial accommodation and/or power sharing is contributing to better ethnic conflict management, post conflict state building and enhancing sustainable peace; or not. Its conclusion is that the effects of territorial accommodation and self-governance autonomy on peace and security have been varying considerably among the federations of the countries in the world (like in Canada, Bosnia, Belgium, Russia, Spain, India, Ethiopia etc). Accordingly, there is no finalized strong consensus among the scholars in the field as to whether territorial self-governance for divided societies is a best strategy in resolving ethnic-conflicts and creating sustainable peace or not. Hence, the theoretical debates on territorial accommodation (self-governance) among the scholars, being accompanied by their respective empirical studies, have been prevalent and receiving the attentions of politicians, political scientists and others. In line with the arguments of the authors, there have been practical illustrations as the territorial accommodation/self-governance can be best strategy in resolving conflicts(example of India, Bosnia, Canada, Belgium); and to the contrary being a triggering and fueling factors of the ongoing or potential conflicts as in the case of the disintegration of the soviet union. The finding of the paper shows that; the design and adoption of territorial accommodation/self-governance is not an end strategy by itself. The practical implementations of genuine territorial self-rules should be realized; that in turn can recognize and achieve impartial, all-inclusive participation and sense of harmonized national ownership among the different ethnic groups of the federalized political system. The further research question of this paper will be conducting pertinent and sustainable further empirical studies to sufficiently address the reason "why different context of the countries over the world have been influencing the results of territorial accommodation/self-governance in line with ethnic conflict resolution and creating peace and stable state in different ways".

KEYWORDS
Territorial accommodation/Territorial self-governance; Ethnic conflict management; Post conflict state building and peace.

1. INTRODUCTION

Among ethnic conflict management mechanisms and practices, territorial accommodate is widely becoming the subject matter and agenda of academic debates among scholars in the field. Yet, there are still no simplified, universally accepted and harmonized conclusive stands on the usefulness of territorial accommodation of ethnic conflicts towards the establishment and enhancement of sustainable conflict settlements. The main arguments of the scholars are central in relation to the question of whether territorial accommodation is a viable strategy for conflict management or not. However, none of the scholars is able to supply a conclusion to end the debates regarding the pro and con of territorial accommodation of ethnic conflicts approaches. Rather, they have been providing sophisticated responses to the core issues persistently raised in the processes of the debate, which further have their own contribution to frame and shape further future research questions and related issue (Wolff, 2011).

Wolff (2011) articulated that whether there is an escalation to violence or not, conflicts in which territory is at stake present an alarming policy challenges to the governments of states in which they occur. Undoubtedly, these challenges are highly crucial for post-protracted violent civil war. Yet, territorial institutional accommodation and/ or power sharing is one of the solutions adopted for such territorial self-determination conflicts; regardless of the scale of their violence. Therefore, focusing on the range of territorial institutional designs adopted throughout the world for territorial self-determination conflicts, can offer a very useful standpoint on the designs available and the environment under which they are likely to be useful tools for settling the ongoing conflicts. The issues of territorial accommodation as the mechanisms of ethnic conflict management have been the theme of most scholars' debates in the field. Accordingly, the academic community is extremely divided over the issue of whether territorial approaches to conflict resolution in divided societies offer appropriate mechanisms to enhance sustainable peace and security; though there is consensus as it mitigates the disintegration of an existing state (Wolff, 2011).

2 RESEARCH OBJECTIVES AND QUESTIONS

2.1 OBJECTIVES

The main objective of this paper is to try and find, in the literature, arguments- pro and con, insights on specific modalities and their risks and benefits, constraints, best practices and lessons learned whether territorial accommodation and/or power sharing is contributing to better ethnic conflict management, post conflict state building and enhancing sustainable peace; or not. Particularly, the study attempts to identify and articulate the normative and conceptual debates among scholars in the field; in line with the contribution of territorial accommodation of ethnic conflicts (positively and negatively) to the efforts of ethnic conflict management, post conflict state building and enhancement of sustainable peace and security. It also pin points the main findings, policy implications and further research question.

2.2 QUESTIONS

Therefore, in order to realize its above objectives, the research question of the study is "how in the literature, the use of territorial accommodation of ethnic conflict has been adopted as a strategy for conflict resolution; management and for post conflict state building and sustainable security and peace?

2.3 ORGANIZATION OF THE PAPER

This paper has five sections. While the first section deals with brief executive summary, the second accommodates the introduction part. The third section is about the Objectives and research questions of the study, which are already presented in the above manner. The core part of the paper is section four, which is all about literature review. Main definitions and concepts of key terms, theoretical concepts and debates of territorial accommodation/territorial self-governance that embrace its merits, criticism; and practical illustrations of territorial accommodation are presented in section four. The final section pinpoints conclusions, main findings, policy implications and further research question.

3. LITERATURE REVIEW

3.1 CONCEPTUALIZATION AND OPERATIONAL DEFINITION OF KEY TERMS

3.1.1 Territorial accommodation, Territorial self-Governance and the notion of self determination

Territorial self-governance/Territorial autonomy is often perceived as an instrument of resolving inter-ethnic conflicts and managing the conflicts in a way that can ensure peace and security among the ethnic groups. It is also seen as a concession between a minority aspiring to realize self-determination and a particular

state defending its territorial integrity and boundaries. Though territorial accommodation/autonomy is widely advocated as a solution to ethnic conflicts and being a solution to many conflicts, there is reason to suspect that it can act as a catalyst of conflict under certain circumstances (Cornell, 2002).

Sunday (2005) defined that Self-determination is the right of ethnic and/or national groups to be an independent and sovereign under an umbrella of a given country. However, putting this definition in to practical implementation is often very difficult since the notion of self-determination can be understand in two different and conflicting ways. Thus, the idea that describes all ethnic groups should be entitled to self-determination and the notion that the state is sovereign over its territory can be seen as a paradox. Since the state is the legitimate territorial unit and simultaneously the notion of self-determination is a right exerted within this particular territory of the state, then incompatibility of interests will arise; which further can be potential for conflicts. Furthermore, though the international law provides the primacy for a state and its territorial integrity, the principle of self-determination has been criticized for fueling and deepening the conflicts among the groups, destabilizing the culturally divergent ethnic groups; and at the extreme point facilitating the fertile grounds for minority groups to have aspiration for secession (Sunday,2005).

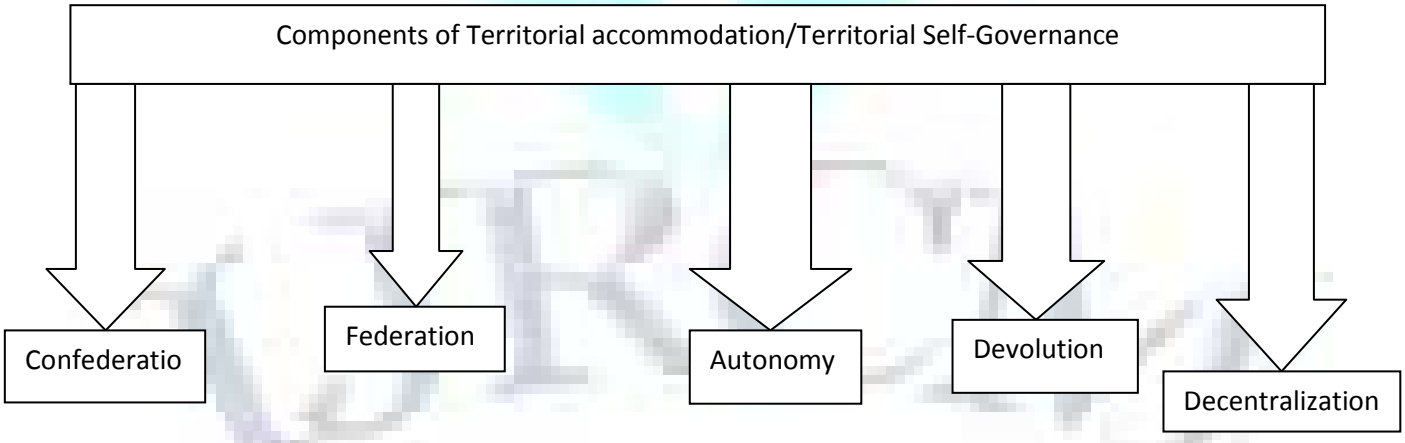
According to Wolff and Yakinthou ed. (2011), the issue of Self-determination struggle and claim; which is manifested by territorially concentrated groups about the actors, explicitly or implicit shows the primary choice for desire of self-government. These motives of the group may have divergent motives, which can range from demands for unification with another state, independent statehood, territorial self-governance within an already existing state, and non-territorial self-governance (or cultural autonomy). While the independent statehood and unification with another state are attributed to the claims for external self-determination, territorial self-governance and cultural autonomy (non-territorial self-governance) are claims for internal self-determination (Wolff and Yakinthou ed., 2011). Thus, from the viewpoint of traditional nation-state processes, the hindrances and bottlenecks created by the two categories of claims (external or internal) are significantly different. Though the notions of external self-determination claims has been putting a lot of pressures and threats to the political boundaries of the state, they do not challenge rather than some extent may even reinforce, the traditional nationalist realization of "one state-one nation". To the contrary, the internal self-determination claims of the national minorities' can highly challenge the basic principle of the contemporary territorial nation-state. Because, the minorities that strive for territorial self-governance are often considered as a group of peoples who are engaging in a competitive nation building that counters majority nation-building processes of a given country. Therefore, the notion of self-governance is the motive and needs of majorities in order to establish and enhance sustainable state stability and conflict regulation and management mechanisms. On the other hand, the issues of territorial self-governance has been become the question of realizing state legitimacy for which the minority groups are struggling for. Since there are high levels of demand with control over the institutions of government and cultural reproduction throughout the territory of the state by the national majorities, the minority groups perceive territorial self-governance as a counter instrument in which they can protect themselves from the domination of the majorities (Wolff and Yakinthou ed. 2011).

More importantly, the concept and the notion of Territorial pluralism/self-governance should be distinguished not only from group-based (non-territorial) autonomy, but also from territorial self-government based on 'administrative' or 'geographic' criteria, including regional components of the state's majority community. Thus, not every form of territorial self-governance is the same with that of ethnically fractioned societies. For example, the articulation and implementation of territorial self-administration in German or Austrian federal states are less relevant to territorial accommodation of ethnic conflicts either than to the Swiss confederation or than devolution in the UK. The process of regionalization in France has greater relevance than the application of the subsidiary basis to the local municipalities in Finland or Ireland; which cumulatively magnify, as there is a need to further define the concept of territorial self-governance/territorial accommodation (McGarry and O'Leary, 1990; McGarry, O'Leary and Simeon 2008).

Wolff (1990) described that there have been substantial theoretical and experiential problems and challenges in defining the concept of Territorial self-governance/territorial accommodation and as it is a strategy of conflict resolution and management. Significantly, most of the debates and discussions have been made among the scholars on the dimensions of—autonomy and federation. Specifically, autonomy is one of the most frequently used terms to explain territorial approaches to conflict resolution and management in fractioned societies. The word "autonomy" is also being employed in both cases of: I) an abstract functional sense in the context of governance arrangements; II) and as a practical demonstration of territorial self-governance at grass root levels-often at sub-state entity in a particular state. Simultaneously, there are empirical issues on the specific context of the regions and the countries (Wolff, 1990). Wolff and Yakinthou ed. (2011) defined territorial self-governance as:

"the legally entrenched power of territorially delimited entities within the internationally recognized boundaries of existing states to exercise public policy functions independently of other sources of authority in this state, but subject to its overall legal order and conceptually, this definition of TSG applies its meaning as a tool of statecraft to the specific context of conflict resolution in divided societies and encompasses five distinct governance arrangements—confederation, federation, autonomy, devolution, and decentralization".

From the above definition, the five modalities of territorial self-governance arrangements can be represented in the following diagram.



Source: Adopted from the conceptual definition of Wolff and Yakinthou Ed; 2011

According to Wolff and Yakinthou ed. (2011), the brief details of the modalities of territorial self-governance are presented in the following manner.

Confederation: It is an association of voluntary independent sovereign member states by treaty that delegate certain of their powers and other related issues to the common confederal government; in order to coordinate their policies in a number of areas, without constituting a new state on top of the member states. Under international law a confederation respects the sovereignty of its members and its constituting treaty can only be changed by unanimous agreement. Good examples are: I) Serbia and Montenegro by an agreement (term) of 2003-6 constitution though it was fully not realized in to practices; and II) Switzer land between 1291 and 1848; but in practices it resembles the application of federation than confederation.

Federation: It is the concern of constitutionally and/or institutionally designed sharing of political, socio-economic and other full powers among the regions of a particular country. In federation political system, constitutionally well-established lawful structure in the whole territory of a given state is divided into autonomous political units like regional states. In this type of political system each region has its own certain exclusive legislative, executive and judicial powers independently of the federal (central) government. The best examples of successful federations in the world include Canada and Belgium; and Yugoslavia, the Soviet Union, and Czechoslovakia are accommodated under historically failed federations.

***Autonomy**:* On the issues like power sharing and constitutional protection, autonomy is similar to that of federation political system/entities. But they have distinction in a sense that autonomy does not necessarily being accompanied by territorial sub-divisions across the entire state territory. In short, Autonomy is basically resembles a character of unitary states through empowering the subordinate or lower unities of the central government. While the classical examples of autonomy are: the Åland Islands (Sweden) and South Tyrol (Italy); the contemporarily ones are Bougainville (Papua New Guinea), Aceh (Indonesia),), and Gagauzia (Moldova).

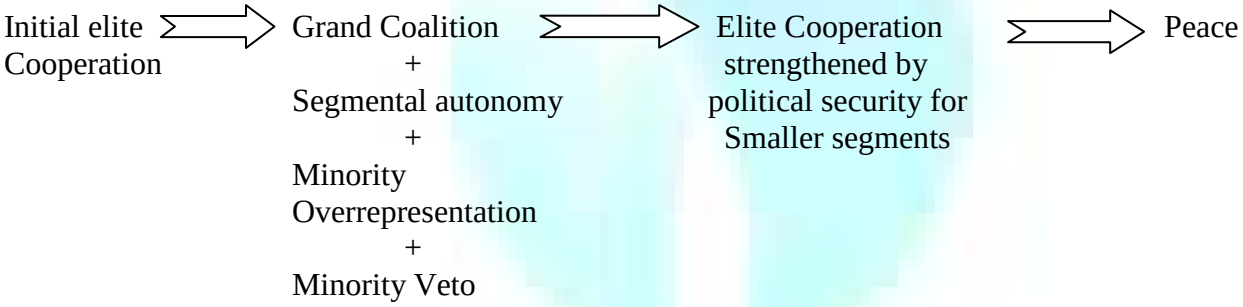
Devolution: One of the mechanisms of achieving the notion of territorial self-governance is the design and implantation of devolution. Though devolution has the same features with autonomy in all aspects, it is different in a sense that it has no strong institutionally backed legal protection as that of autonomy. Thus, devolution can be easily reversed since it is only applied with help of regular laws than strong constitutional laws. Most commonly known examples of devolution as a form of territorial self-governance are Spain and the United Kingdom.

***Decentralization**:* It is the process of granting the executive and administrative powers to the local units from the central government through being guided by the principles of subsidiary. The notion of decentralization is rarely backed by the constitutionally designed laws and it is not normally accommodate the legislative competence. The application of decentralization as a means of conflict resolution and form of territorial self-governance includes Macedonia and Kosovo (Wolff and Yakinthou ed, 2011

The main agreement and consensus among the above scholars (McGarry and O'Leary, 1990; McGarry, O'Leary and Simeon 2008; Wolff, 1990; and Wolff and Yakinthou ed, 2011); is that there has been a need for institutional arrangements to handle and address the conflicts among the divided societies. Thus, no lack of harmony among these scholars as there should be institutional design for settling ethnic conflicts among the fractioned societies. Furthermore, assigning the substantial powers to the self-governing units, financing them adequately for their successful responsibility discharges, clear demarcations of competences(powers) among the central and territorial entities and providing dispute resolution mechanisms can be embraced under the agreements of the authors; which can be backed by institutional reforms including constitutional deigns. Another agreement of the authors is related with the concept and the notion of Territorial pluralism/self-governance. Thus, it should be distinguished not only from group-based (non-territorial) autonomy, but also from territorial self-government based on 'administrative' or 'geographic' criteria. Thus, no form of territorial self-governance is the same with that of ethnically fractioned societies. For example, the articulation and implementation of territorial self-administration in German or Austrian federal states are less relevant to territorial accommodation of ethnic conflicts either than to the Swiss confederation or than devolution in the UK. The process of regionalization in France has greater relevance than the application of the subsidiary basis to the local municipalities in Finland or Ireland; which cumulatively magnify, as there is a need to further define the concept of territorial self-governance/territorial accommodation (McGarry and O'Leary, 1990; McGarry, O'Leary and Simeon 2008).

According to the Lijphart's theory of consociational democracy, there are four most important pillars of the consociational democracy model. The first and most basic is *Grand coalition* of the political party leaders in which includes the segments of all societies. Under this pillar, all leaders of political parties have proportionate representation in the organs of governments; like in parliament and executive cabinets. The second is *segmental autonomy* that can be realized in the form of either ethnicity, religion, culture or other type of segments in which the sections of the society can decide on their own affairs. The third essential basic element of consociational democracy is *proportionality*; in which political and other civil service representation and government resource allocations to the different segments of the society can be achieved based on their relative ratio of population. The last is *minority vote* that can ultimately protect the minorities via creating political security, self-confidence and peace of mind for the minorities. In short, these four basic elements are the cornerstones of consociational democracy that may cure the inter-ethnic conflicts of the fractioned societies through accommodating their interests and paving the ways for harmonized sustainable peace; in the way it has been conceptualized in the following diagram (Sullivan, 2005).

LIJPHART'S THEORY OF CONSOCIATIONAL DEMOCRACY AS APPLIED TO DEEPLY DIVIDED SOCIETIES



(Source: adopted from Sullivan, 2005)

3.1.2 Ethnic conflict resolution and Management

Quinn (2008) stated that since the end of the Second World War only, 79 territorially concentrated ethnic groups had been engaged in armed ethnic conflicts to form their own self-governance and autonomy in the form of independence. This figure does not include the former colonies of Europe. For example, in 2006, there were 26 ongoing ethnic conflicts throughout the world while 55 ethnic groups were already pursued their self-governance goal with no violence mechanism. In addition, 44 ethnic groups were using both violence and non-violence means of struggling to realize their own territorial self-governance missions. Therefore, in the era of twenty first century, there have been more than 120 ethnic groups that have been striving for their territorial accommodation; which may be manifested in the form of cultural and territorial autonomy either to form independent statehood or unification with another state(Quinn, 2008).

Before trying to see what the ethnic conflict resolution and management is, it is necessary to look at the conceptual definition of ethnic conflicts. Gurr (1994) defines ethnic conflict as a situation in which groups define and articulate themselves in line with their own ethnic criteria and make claims on behalf of their mutual motives against the particular state and/or against other political and administrative leaders. Edmond (2002) also stated that severe ethnically based conflicts are generally based on elements of a group's historical memory; fear of physical insecurity, and upon perceived or real discrimination, inequalities, or inequities among the ethnic groups.

Therefore, any effort which tries to find the ways of addressing these problems through divergent mechanisms is termed as ethnic conflict resolution and management. In other words, Ethnic conflict resolution and management is the process of establishing and enhancing the capacity of political institutions to contain the ethnic conflicts in the appropriate mechanisms, routines and procedures (Cohen, 1997). Thus, ethnic conflict resolution and management can be designed and put in to practices through accommodating all groups in the processes of formulating and implementing public policies and programs in multi-dimensional sectors to build trust among the constituent ethnic or nationality groups of the country. These all can in turn engender a sense that government is credibly committed to respecting and protecting the rights of all groups (Cohen, 1997; Edmond, 2002). in addition, it has been stated that realizing and securing the commitment of political leaders to social justice, establishing a government that is transparent and honest in eyes of all ethnic groups, and making sure that the political system operates according to the doctrine of democracy, good governance, impartiality and rule of law can go a long way toward an effective and sustainable conflict resolution, management and peace-building (Edmond, 2002).

Though the majority of African states have sovereignty after their independencies; their leaders have been suffering from lack of properly designing and practicing their responsibilities to govern the people in such a manner that protects the rights of all nations, nationalities, peoples and citizens via creating trust and legitimacy in the views of all ethnic groups as a whole.

3.1.3 **Post conflict state building and peace**

This sub-section deal with the arguments and corresponding ideas of some scholars on post conflict state building and peace enhancements. Particularly, post conflict state building and peace concepts, as well as related ideas are discussed in this section in the following manner.

The arguments and ideas of the different authors on the issue of post conflict state building and peace have identical standpoints. For instance, while Brinkerhoff (2005) identified three interlinked post conflict government reforms as Reconstituting legitimacy, re-establishing security and rebuilding effectiveness, Hamre and Sullivan (2002) presented four elements that have accommodated the issues described by Brinkerhoff (2005) which shows as they have similar ideas. However, Hamre and Sullivan (2002) have proposed additional conceptual elements of post conflict state and peace building packages (i.e. Justice and reconciliation; and security). In the same manner, the conceptual elements presented by World Bank (which is reconstructing of the socio-economic environments of the society to its normal status and further enhancements, and reconstruction of favorable conditions for peace time society) have direct linkages with what Hamre and Sullivan (2002) and Brinkerhoff (2005) are presented. Hence, there are no contradictory ideas in the conceptual variables discussed by the above three authors rather than complementing and supporting each other. On the other hand, Hartzell and Hoddie (2007) have come up with differentiated conceptual components, which have similarities with consociational democratic power sharing and power dividing reforms. Hence, the authors stated that the more the power sharing and power dividing among the divergent ethnic groups in line with the four dimensions of state power(i.e. political, military, economic and territorial), the more conflict settlements and state building will be stable and sustainable. The detailed narrative conceptual arguments of the individual authors are presented below.

The issue of post conflict state building and peace is relevant with the failed and failing states. Before, we are going to see the pillars and conceptual framework of post conflict reconstruction in the form of building state and peace, it is better to understand the key features of a failed state (Brinkerhoff 2005).

According to Brinkerhoff (2005), a failed state is characterized by: I) a breakdown of order and law; in which the state has no more monopoly power over the protection of its citizens from violent conflict risks, II) when the state is unable to render the socio-economic facilities and other infrastructures to its citizens; and III) Lack of credibility from international community beyond the territory borders of the state. Hence, most of the failed and failing states have been more or less being featured by the three parameters mentioned in which they further demand post conflict reconstruction and state building efforts. Therefore, in order to overcome the basic characteristics of failed and failing states, three integrated and interrelated post conflict governance reforms. That means Reconstituting legitimacy, re-establishing security and rebuilding effectiveness (Brinkerhoff, 2005). The details are presented below.

RECONSTITUTING LEGITIMACY

Reconstituting legitimacy in post conflict comprises a package of government reforms starting from constitutional redesign and rule of law in a way that can realize the check and balance among the government organs. More importantly, promoting all inclusive participation, reducing inequalities among the citizens , combating corruption , introducing free and fair elections, delivering services via ensuring accountability should be included under the packaged activities of reconstituting legitimacy in post conflict peace and state building efforts. By doing so, government can further enhance its willingness and capacity to properly address the needs wants of its citizens; which in turn can lead to sustainable peace and development programs (Brinkerhoff, 2005).

RE-ESTABLISHING SECURITY

Re-establishing security contains the activities like: making primacy for creating peace, restoring security and stability, dealing with ex-combatants through planning and implementing DDR (disarmament, demobilization and re-integration). However, it should be known that without proper capacity building and enough preparation to restart the economy and creating employment opportunity, DRR would exacerbate the already ongoing violent conflicts via fueling the banditry and re-emergence of violent conflicts. Similarly, planning and implementing peacekeeping operation that will be accompanied by the humanitarian assistance and emergency reliefs should be incorporated in the processes of re-establishing security. Among all, re-organizing internal peace and security forces that have been backed by the community support should be designed and implemented. Specially, the police, militia, paramilitary and other private armed security forces can be trained, re-organized and play their front line in the process of re-establishing security in the country and building the state at hand (Brinkerhoff, 2005).

REBUILDING EFFECTIVENESS

The creation and enhancement of good governance is a key factor for the delivery and prevalence of public services, infrastructures, socio-economic facilities, communication networks and related activities. Therefore, in order to rebuild the effectiveness of the state, multisectoral programs should be planned and implemented through realizing all-inclusive participations. Thus, civic society, general public, non-governmental organizations and the government itself must cooperate with one another and play their respective roles as desired. To crystallize these issues, all stake holders-particularity, the government must avoid the cronyism and patronage arrangements of personalized political system via installing active involvements of its citizens. Besides, stabilizing the macroeconomic at sound level and ensuring fair wealth distribution among the citizens, achieving efficient utilization of scarce resources and fighting against corruption should be the components of rebuilding effectiveness of the states (Brinkerhoff, 2005).

Hartzell and Hoddie (2007), conceptualized that political, military, economic and territorial are the four dimensions of state power across which multiple power sharing and power dividing should be creation and implemented; as 'highly institutionalized negotiated settlement of conflicts. According to the authors, the more the power sharing and power dividing in line with these four dimensions of state power, the more conflict settlements and state building will be stable and sustainable. It is also indicated that among the four aspects of state power sharing and power dividing, territorial dimension is the most significant that helps to reduce risks of violence after civil wars. Nevertheless, territorial power sharing and power dividing may not be good strategy when the groups are not associated with a particular territory (Hartzell and Hoddie, 2007).

According to the World Bank (1995), the definition of post conflict reconstruction is highly concerned with the rebuilding of the socio-economic networks (frameworks) of the society at the risk of conflicts; and creating favorable conditions for a functioning of peacetime activities and frameworks that embrace governance and rule of law. From this definition, we can pinpoint two conceptual key elements. While the first component is reconstruction of the socio-economic environments of the society to its normal status and further enhancements, the second is concerning the reconstruction of favorable conditions for peacetime society; in which the institutional framework of governance and rule of law can be smoothly functioning (World Bank, 1995).

Beyond the reconstruction and enhancement of the socio-economic well-being, governance and rule of law, the definition of Hamre and Sullivan (2002) goes to the articulation of other elements. Thus, Justice and reconciliation; and security are the other two additional conceptual elements of their definition. According to the definition of Hamre and Sullivan (2002), contemporarily post conflict reconstruction consists of four distinct elements that have interrelated and interlinked package of pillared tasks. The brief details are as follows.

Security: It deals with all dimensions of the citizens' peace and safety. Specifically it strives for the restoration, re-existence and enhancement of stable and conducive peace of mind and environment for the socio- economic activities of the society; through creating and building legitimate and effective security institutions. The security accommodates the collective and individual freedom to do multidimensional activities in any sector without any fears and threats in a way that can lead to successful achievements and advancements in a sustainable manner. Therefore, the aftermath of immediate and large-scale violence as well as restoring the territorial integrity of the post conflict state to the normal situations and further ensuring the everlasting peace and security in the country should be taken as the springboard for the overall development and governance of the country (Hamre and Sullivan, 2002).

Justice and reconciliation: In concerns about the demand for establishing and building the efficient and effective formal and informal legal systems that can reverse humanitarian crises and disorders through resolving disagreements and grievances arising from the previous or ongoing violent conflict. Thus, designing and putting in to an effect of impartial and accountable legal system for present and future, reorganizing law enforcement apparatus that facilitate and support an open judicial system should be incorporated under the newly intended justice and reconciliation systems. These all requires have committing leadership roles, appropriate institutions and working procedures of justice and legal system that have been supported by law enforcement instruments like security and peace forces (Hamre and Sullivan (2002).

Social and economic well-being: It is addressing the core socio-economic needs and wants of the community at risk of violent conflicts. Thus, formulating and implementing the main facilities like health, sanitation, and education. Communication networks and other related infrastructures and laying the favorable

condition for all-inclusive emergency reliefs and ensuring sustainable development should be incorporated in the social and economic well-being of the societies. These all rounded multisectoral activities can be attributed to the efforts of creating and building socio-economic networks that have great contributions to stabilize the disorders and violence; through creating and building resilience institutions and societies (Hamre and Sullivan, 2002)

Governance and participation: The functions of government organs (legislative, judiciary and executive) should be participatory and all inclusive starting from the policy formulation up to their implementation processes onwards. More importantly, the government should have the legitimacy of public acceptance, cooperation and mutual unity of directions and active participations of all stakeholders in multisectoral activities. Hence, civic society, non-governmental organizations, community representatives, religious leaders and other concerned bodies should be involved in the effective political and administrative institutions; in a way that can realize sense of belongingness and commitments of the stakeholders. If so, the previous violent conflicts can be reconstructed through laying the encouraging environment for stable peace and security; in which the state and society can jointly further advance to sustainable development programs (Hamre and Sullivan, 2002).

3.2 THEORETICAL CONCEPTS, MERITS AND CRITICISMS OF TERRITORIAL ACCOMMODATION

Territorial accommodation (territorial self-governance); as a mechanism of ethnic conflict resolution and management; has been becoming the subject matter of debates among the scholars in the field. Particularly, the debates of academic community is extremely divided on whether the territorial accommodation in alienated societies is an appropriate strategy for conflict reduction and creating sustainable peace and security among the divergent ethnic groups(Wolff, 2011). McGarry and O' Leary (1990), stated that territorial self-government has been considered as an instrument of statecraft and a means of conflict resolution and management in divided societies. Particularly, it is pinpointed that when there are needs and interests of highly populated (dense) ethnic groups demand for self-determination, territorial self-governance is a crucial devise. According to these authors, to design and apply the territorial self-governance, concentrations of ethnic groups on specific geographical areas through having common motives and desires are preconditions. Therefore, territorial pluralism or territorial accommodation helps geographically concentrated national, ethnic, linguistic, or religious communities in way that they can claim for self-governance. However, designing and implementing territorial self-governance is not relevant for small sections of the community since it is infeasible and undesirable for such scattered and dispersed portions of people including immigrant communities (McGarry and O' Leary, 1990).

There have been a lot of debates on the issues of territorial accommodation/territorial self-governance. For instance, some authors like: Cornell (2004), Roeder (1991), Hale (2004) have similar arguments on the question of whether territorial accommodation is to be a good strategy to resolve conflicts or not. Hence, these authors argue that territorial approaches to resolve inter-ethnic conflicts in divided societies is not in a position to be cure for violent conflicts among the divergent ethnic groups. Rather, It has been fuelling and exacerbating the conflicts and to the extreme point promoting the needs and motives towards secession. To the contrary, authors like: Gurr (1993), Saideman et al (2002) and to some extent Wolff (2009), have identical stand point via arguing that territorial accommodation have been widely used in the contemporarily world and it reduces the level of violence among the conflicting ethnic groups. Particularly, Gurr (1993) Saideman et al (2002) conclude that territorial accommodation/territorial self-governance, which is usually used in the form of federalism, significantly mitigates the conflicts among different ethnic groups through accommodating the needs and wants of the groups. In between, the arguments of Brancati (2009), seems to have contradictory ideas since her arguments are not precise as that of other authors' arguments. She argues that the more territorial accommodation is decentralized, the more the number and strength of the regional political party will be which further promote conflicts among ethnic groups in the long run though it reduces the same in the short run.

Having seen the above condensed arguments of the scholars, in the following sub section, we look at the detailed debates of the authors in line with merits and criticisms of territorial accommodation/territorial self-governance; via accompanying it by practical illustrations.

3.2.1 Merits of territorial accommodation/Territorial self-governance

Gurr (1993) argues that as the fact on the historical evidence shows on the track of records, on average the inter-ethnic group conflicts and tensions can be minimized under political arrangements of regional autonomy, which can in turn radically reduce the violent conflicts among the competing ethnic groups. By supporting the arguments of Gurr(1993), Saideman et al (2002) stated that federalism type of political system, which has been backed by the granting of power and autonomy to the local groups (usually ethnic minorities), can highly help in resolving inter-ethnic violence and building the peace and states on the grass root levels. The research of these authors showed that, if the needs and wants of local ethnic groups are properly, fairly and impartially addressed through effective and efficient institutional reforms under territorial accommodation/autonomy, it can be an instrument in reducing conflicts among the groups and creating peace and sustainable securities of the countries at large. Lijphart (2004) also stated that for ethnically fractioned societies with the realism of geographically intense communal groups, self-rule in the form of decentralized governance; like federalism type of political system is a better way of building autonomy at grass root levels. Hence, Power sharing and self-government, parliamentary type of political system with the accompanying federalism or decentralization type of self-rule can be a good alternatives to accommodate the motives and desires of divided societies at regional and/or local areas (Lijphart, 2004). The implication of the arguments of these authors is that as far as the territorial accommodation and autonomy is designed and implemented in genuine, impartial and all-inclusive ways, it can further serve as a means of fostering national harmony, consensuses, sense of belongingness and comprehensive strategy for protecting the unity of territorial integrity and for building stable states. By supporting this idea, Wolff (2009) stated that in the contemporarily world, the notion of territorial accommodation and self-governance autonomy has been used as an instrument of resolving the ethnic conflicts and ensuring the sustainable peace and stability among the different competing ethnic groups. Gurr (2004) also agrees with this argument by pinpointing that if territorial accommodation and territorial self-rule is not granted to the geographically concentrated regional/local ethnic groups, then violent and armed ethnic conflicts will arise at the end of the day. Furthermore, the benefits of territorial accommodation as practical illustration have presented below.

Thus, there are empirical studies that crystallized as the territorial accommodations in the form of ethnic based federalism type of political system has successful met its presumed goals and objectives in counties of the world; like India, Canada and Belgium. Thus, Belgium, Canada and India are known by the good management of territorial self-governance disputes. These countries are best examples of territorial accommodation that have been resulting in effectiveness of avoiding violent conflicts through designing and implementing consociational power sharing democracy (Wolff, 2011).Since it can be practical experiences let us look at the Indian case briefly as example. In the academic analyses of the Indian ethnic based federalism, there are three reasons being given for its success (Louise and Magnus, 2008). Firstly, in the processes of designing and realizing of the Indian politics, there is no incompatibility between claiming an ethno-regional and national identity. Secondly, the India's huge diversity, the many crosscutting cleavages within and between subunits and ethnic groups; such as religion, language, caste, tribe; and the like are averting the cultural and social divisions to cumulatively reinforce each other through allowing for further mutual advancements, all inclusive harmonized approaches, flexibility and shifting alliances both between individuals and groups (Manor 1996). Thirdly, the resilience of the Indian federal system is by many explained by the strength of its parliamentary democracy, regular elections and the spread of democratic ideas that have led to increased political activism among the wider population, including marginalized groups (Dalits, other low castes, and Muslims). It has also enhanced the legitimacy of the central government and made it possible to justify a strong center, securing the unity and efficiency of the federation (Manor 1996).

3.2.2. Criticisms of territorial accommodation/Territorial self-governance

This sub section deals with the criticisms of some scholars on the issues of territorial accommodation/territorial self-governance with its accompanying practical illustrations in the following manner.

Based on the constructionist theory, Brancati (2009) argues that regional differences by itself cannot necessarily lead to the emergence of the regional political parties. Rather, it is decentralized (territorial accommodation/self-governance) type of political system that generates and promotes the regional political parties; which further in the long run can create and promote inter communal conflicts and secessionism through rewarding rebellion movements against the regimes of the federal(central) government. In another words, decentralization increases the number and capability of regional political parties; which in the short period mitigate conflicts among ethnic groups; through giving the ethnic groups power and control over their socio-economic and political affairs. However, in the long run, decentralization increases ethnic conflicts since the regional political parties will get strength and compete over power in a way that can ultimately promote secessionist movements. Therefore, territorial accommodation via the mechanisms of either decentralization or federalism can trigger and fuel conflicts and sentiments of secessionist movements through mobilizing the ethnic groups in the regions. Particularly, this is true on the grounds when

there are four structural important dimensions (Brancati, 2009). These four structural dimensions are: I) Number of regional representation in the legislative organ of the country, like in parliament; II) the number of regional legislatures; III) the system and steps in which selection of the upper house is represented; and IV) the design and sequence of regional and federal elections (Brancati, 2009).

The main argument of Brancati is that territorial accommodation/self-governance though decentralization will reduce conflict and secessionism in the short run; it may exacerbate inter-ethnic conflicts in the end since the number of regional political parties is radically increased. Thus, territorial accommodation or self-governance through empowering regional/local autonomy in the form of decentralization can reduce anti- regime rebellion while regional political parties increase the conflicts (Brancati, 2009).

Therefore, from the above argument of Brancati, I can derive the following conceptual mathematical equation and the accompanying graph.

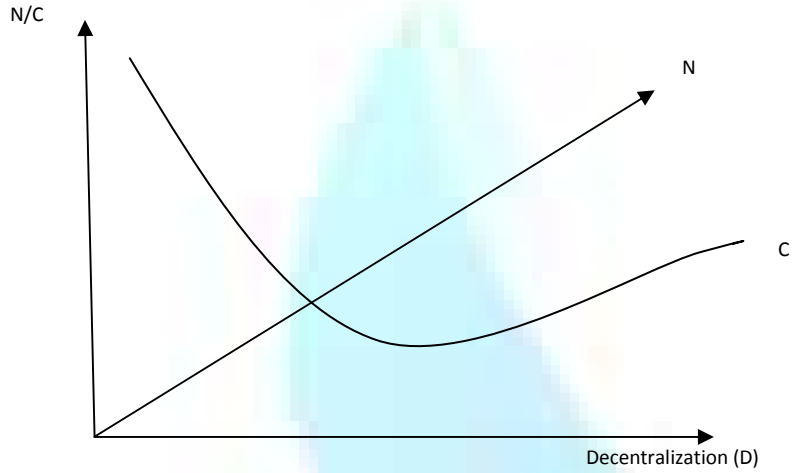
D = N/C

Where, D= Level of decentralized territorial accommodation/self-governance

N = number and strength of regional political parties

C = level of conflict among ethnic groups

Graphically, it can be represented as follows.



Source: adopted from the Brancati's (2009) arguments

From the graph, we can understand that as the level of decentralized territorial self-governance increases, the number and strength of regional political party increases, which indicates their direct correlations. On the other hand, as the level of decentralization increases, the conflict among the divergent ethnic groups will decrease in the short period because the number of the regional political parties in the short run will not be expected to increase drastically. However, in the long run, since the number of regional political parties is going to increase at the pace greater than the rate at which the level of territorial accommodation (decentralization) increases, definitely conflict and the secessionism movement of the groups will emerge and escalate to violent levels. Therefore, the design and implementation processes of territorial accommodation whether it is via decentralization or federalism, must balance the short and long-term effects; which the constitution writers, politicians and a scholars in the field should take in to considerations.

Contrary to the ideas of Gurr (2004) and Saideman et al (2002), Cornell (2004) argues that though territorial accommodation has been perceived as a good strategy for resolving inter-ethnic tensions and create sustainable peace among ethnic groups, the opposite is true on the practical realities of the world. Thus, the notion of providing a particular group autonomy that may be backed by institutional framework has been triggering and even exacerbating the ongoing and the outstanding conflicts among the conflicting ethnic groups. Specifically, under certain political conditions, the process of establishing and building autonomy for a particular ethnic group can be a fertile ground for further divisions and promote the motives of separation movements. More importantly, the ethnic group that secured autonomy may be even encouraged with engaging in against the federal (central) government in a collective manner (Cornell, 2004).

By supporting the arguments of Cornell(2004), Roeder (1991) also argued that after seven decades of the Soviet regime assumes power, the ethno politics which is known by Soviet federalism and ethnic mobilization had become disastrous in a sense that fueling inter-ethnic tensions as a weapon of disintegrating the USSR-Union of Soviet Socialist Republics. In another words, the suppression of ethnic identity and under the created self-rule republic autonomy of the regions in the soviet state has been promoting the conflicts among the ethnic groups in the areas (Roeder, 1991). Hale (2004) also expressed that ethno based federal states have high probability of being collapsed when the ethnic based territorial accommodation (ethnic based federalism) comprises a core ethnic region- a region that has superior population over the other ethnic groups. In other words, if territorial self-governance, which is manifested by ethnic based federalism does not institutionally divide the core ethnic region/s in to manageable sub autonomous groups under the federations, there are tendencies of promoting mass movements of the core dominant regions that further leads the regions in to the separation motives than ever before does (Hale, 2004).

The argument of Hale (2004), offers another extra perspective beyond the ideas of Cornell (2004) and Roeder (1991). That means, if the dominant groups are divided, it faces challenges and difficulties to mobilize and engage in to massive core-group-oriented collective actions, through minimizing the chance of violent ethnic conflicts. This in turn, gives the central government opportunities to take advantage of divisions within the core group and ultimately make the central government to be free and achieve strategies issues that can further realize territorial and state preservation; that accommodates bargaining, trust building, and/or coercion measurements. Hale (2004) conclude that paradoxically, the institutional divisions of the dominant ethnic groups can promote and consolidate the integration and unity of the federations. He also described as the Tanzanian and Belgian cases of complex ethnic power-sharing arrangements might be in a position to overcome the challenges and related bottlenecks allied with core ethnic regions. Nevertheless, as to the arguments of Cornell (2004), Roeder (1991), and partially Hale (2004), territorial self-governance/territorial accommodation is not a good strategy for ethnic conflict management in divided societies since it triggers and exacerbates the conflicts among the ethnic groups.

As an illustration of the above arguments in real practices, Cornell(2002) stated that though there is an ideology that territorial self-governance/autonomy can create harmony and unification of divergent ethnic groups, the Soviet State was facing the challenges of disputes under its hierarchical ethnic based federalism political system. For example, under the 15 main union republicans that the union comprises, there had been above 30 autonomous regions and republicans with the minimum levels of self-governance. Nevertheless, all minority ethnic groups were not addressed under the political system of the territorial self-governance rule; due to many factors among which the main reason is if the ethnic group in question was granted the opportunity of self-governance some elsewhere in the hierarchical ethnic based federalism. Hence, groups such as Russians in Kazakhstan, Tajiks in Uzbekistan, and countless others became so-called 'non-status' minorities despite their large numbers (Cornell, 2002). To some extent by supporting the argument of Cornell(2002), Wolff(2011) also described that though initially the dissolution of the Soviet Union occurred without the use of violence disputes, gradually it had been triggering a lot of territorial self-determination disputes; such as Moldova (Transnistria) and Georgia (Abkhazia and south Ossetia). Thus, territorial accommodation to this countries including Russia and Spain had been known by mixed results as long as the territorial self-governance in the countries have been accompanied by dispute violence that can be seen as challenges and threats(Wolff, 2011).

Furthermore, as an additional illustration, when we look at the Ethiopian territorial accommodation that is characterized by ethnic based federalism, it has threats, which are the opposite of the Indian experience (Louise and Magnus, 2008). Thus, the fundamental pillars of the Ethiopian political system since 1991 to date are dedicated to an isolated individual identity rather than rewarding and promoting the superior ones; to an overall national identity. Thus, ethnically based organizations and parties are consistently favored in the country which supports Brancati's (2009) arguments in practice. The basic argument of the Brancati (2009) is that even if territorial self-governance through decentralization decreases inter-ethnic conflicts in the short period, it fuels and exacerbates the conflicts since the number and overall capacity of regional political parties will drastically increase and compete in the long-term. Accordingly, in Ethiopia, major societal cleavages are partly crosscutting and partly overlapping and the ethnic divisions seem to absorb most of the controversies along other conflict lines. This means, conflicts between subgroups within the federation are channeled into ethnic lines, thereby "ethicizing" social and economic cleavages through creating conflicts among the ethnic groups; which is compatible with the arguments of Brancati (2009). Therefore, ethnic federalism of the country (Ethiopian), seems to lack what the India's federation has; essentially through creating ethnic-centered all rounded competition, reciprocated distrust, offense and instituting tribal dynamics that could easily result in loss of human lives, injures, disabilities, disintegration of socioeconomic networks and dysfunctions of normal activities of the societies in the areas (Louise and Magnus, 2008).

4. CONCLUDING REMARKS

4.1. CONCLUSION

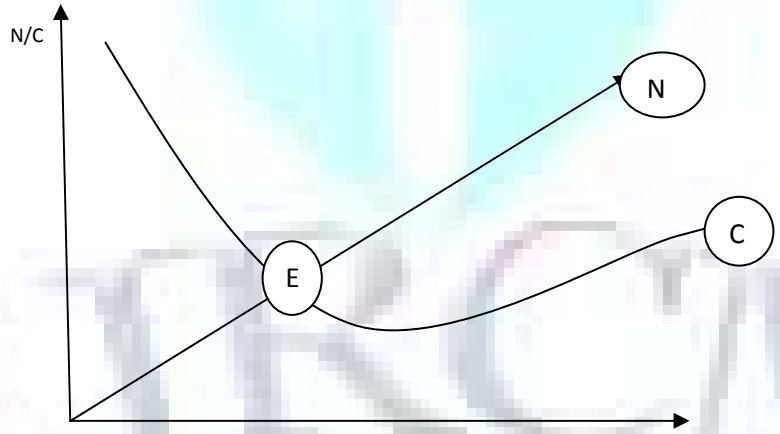
The effects of territorial accommodation and self-governance autonomy on peace and security have been varying considerably among the federations of the countries in the world (like in Canada, Bosnia, Belgium, Russia, Spain, India, Ethiopia etc). Accordingly, there is no finalized strong consensus among the scholars in the field as to whether territorial self-governance for divided societies is a best strategy in resolving inters ethnic-conflict and creating sustainable peace or not. Hence, the theoretical debates on territorial accommodation (self-governance) among the scholars being accompanied by their respective empirical studies, have been prevalent and receiving the attentions of politicians, political scientists and others. However, it seems that, all scholars have common understandings and agreements on the need of institutional arrangements (designs) to accommodate the motives and needs of conflicting groups; in a way that it can realize all-inclusive participations of divergent ethnic groups at grass root levels. The scholars also agree as there should be a call for further sound scientific researches on the issue.

4.2. MAIN FINDINGS

The main finding is that the theory and notion of territorial accommodation/territorial self-governance has mixed results both in conceptual debates and in practical illustrations; which further has been articulating and consolidating the arguments of the scholars in the field. Thus, while some authors argue against territorial self-governance through narrating as it triggers and fuels the ethnic conflicts than being cure, other authors argue for its best mechanism in resolving inter-ethnic conflicts in divided societies. In line with the arguments of the authors, there have been practical illustrations as the territorial accommodation/self-governance can be best strategy in resolving conflicts(example of India, Bosnia, Canada, Belgium); and to the contrary being a triggering and fueling factors of the ongoing or potential conflicts as in the case of the disintegration of the soviet union. Therefore, another main finding of this end of module paper is that the design and adoption of territorial accommodation/self-governance is not an end strategy by itself. The practical implementations of genuine territorial self-rules should be realized; that in turn can recognize and achieve impartial, all-inclusive participation and sense of harmonized national ownership among the different ethnic groups of the federalized political system.

4.3. POLICY IMPLICATIVE RECOMMENDATIONS

Since there are no final universally simplified frameworks for Territorial accommodation/territorial self-governance, every efforts of designing and implementing the self-rule autonomy should be principally based on the specific realities of the countries; in which all of the ethnic groups can entertain their interests in the systems. However, any form of territorial self-governance should consider and address the following pinpointed issues. Thus: I) the size and number of the autonomous regions need to be reasonably equal to minimize the fears and the challenges emanated from the core dominant regions. II) In order to facilitate favorable environments for sustainable consociational power sharing and power dividing among the divergent ethnic groups via territorial accommodation, well-timed international interventions and the deployment of peacekeeping forces are crucial. III) Balancing the level of decentralized territorial self-governance with the corresponding strength and number of regional political parties in a way that can stabilize the security, peace and stability of the federal states. Bench marking on the conceptual debates of Brancati (2009), I recommend the hypothetical equilibrium level of decentralized territorial autonomy and the accompanying numbers/strength of regional political parties at *"E"* as follows.



4.4. FURTHER RESEARCH QUESTION

The further research question of this paper will be conducting pertinent and sustainable further empirical studies to sufficiently address the reason "*why different context of the countries over the world have been influencing the results of territorial accommodation/self-governance in line with ethnic conflict resolution and creating stable state in different ways?*".

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GREEN BANKING SERVICES FOR SUSTAINABILITY

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ABSTRACT

Banking sector is the life line of the economy. Banking services have been evolving from the non eco-friendly to eco-friendly services. Technological developments played an important role in developments of green banking. The recent trends in customer preferences are directing towards green banking practices. The objective of the study is to know the emerging trend of the green banking in India. The difference between the manual and electronic transactions are to be disused. Green banking services includes online banking services, debit card , credit card, ATM services, Fund transfers (N.E.F.T/R.T.G.S) , giving the gifts or credit points to the green customers etc. covered in this research. The research discovers how these services are helpful in satisfying the customers by reducing their queuing time for their transactions in the bank, travelling time from home to bank, saving the travel time and utilizing that time for other important activities. The other services are regarding secured online transactions, transaction settlements and sanctioning of funds etc. Indian banking sector consists of foreign banks, domestic banks (public and private), and other financial institutions. This study covers the recent developments in banking sector for sustainable development of the banking sector.

KEYWORDS

Green banking- Foreign and Domestic Banks - Sustainable development.

EVOLUTION OF BANKING SECTOR IN INDIA

The banking sector in India has been evolving in different dimensions. Those dimensions were described in this study. Banking System in India is over two hundred years old. During the British period, majorly there were three Presidency Banks but in 1921 Imperial Bank of India (IBI) was formed by merging the three Presidency banks. Only in 1934, Reserve Bank of India (RBI) was formed by taking over the functions of a Central Bank of the country from Imperial Bank of India. In 1955, IBI was transformed into State Bank of India (SBI) 1955. Within two years of formation of SBI, seven subsidiaries which were the treasuries of the Kings in different regions were made part of State Bank Group. The State Bank Group (SBG) was given the primary responsibility of opening more and more rural branches and lending to the rural sector including agriculture, small business, etc.

Subsequently, with the two nationalizations in 1969 and 1980, twenty leading private banks were brought into the fold of Public Sector Banks (PSBs). The Indian Banking System also comprises the co-existence of Old and New Private Sector Banks, Foreign Banks, Cooperative Banks, Regional Rural Banks and Local Area Banks. The operations were mainly to attract deposits which were deployed in lending and investment in securities besides complying with RBI requirements. However, up to late 1980s, Indian Banking system was working on traditional lines. Apart from adopting archaic accounting principles, risk management techniques, etc., they were adhering to the administered interest rates of RBI and directed lending to identified sectors without concern for customer care, productivity and profitability parameters.

The economic reforms in India started in early nineties, but after about three decades, their outcome is visible now. It was such a coincidence that while the Indian economy suffered with shortage of Foreign Exchange Reserves in 1989-90 due to political and economic ills in India, banking sector became the target or victim thus becoming a subject of reforms simultaneously. Major changes took place in the functioning of Banks in India only after Liberalization, Privatization and Globalization. Due to reforms in the 1990s, the depth and width of financial system in India has improved and two PSBs were merged making the number down to nineteen. Though role of banks as financial intermediaries has reduced gradually, market share of banks continues to remain the largest in the financial market. Increased competition, new information technologies and thereby declining processing costs, the erosion of product and geographic boundaries, and less restrictive governmental regulations have all played a major role for Public Sector Banks in India to forcefully compete with Private and Foreign Banks. Healthy competition has set in among different banking players leading to efficient customer relations management.

It is interesting that Foreign Banks were operating in India for over a century. Even though, RBI liberalizing the licensing policy and enabling more Foreign Banks and their branches to be established / opened in India since 2005, there seem to be no much change in their market share. These banks are expected to be having attractive financial products, offering competitive service, world class working environment with technologically equipped manpower and quick decision-making. However, domestic banks have also competing with technology, competitive products and services offered. Several agencies started comparing the working of Banks in India on their performance over the past, through surveys.

Banks in India have become compliant to the mechanization followed by computerization and well net-worked. Technology was introduced in a progressive manner both at back-office and front office level in almost all the branches in rural, semi-urban, urban and metro centers. Gradually, ATMs, Internet Banking, Credit, Debit & Smart Cards and other facilities were made effective at all the bank branches. These changes and developments have benefited to all the customers. Banks are investing / spending huge funds for technology as well as training its staff in order to meet the changed work environment and Core Banking became order of the day. Banks are adapting to Risk / Asset Liability Management aspects and also compliance to Basel norms by attaining global standards.

THE EMERGING TREND OF "GREEN BANKING"

The term "Green Banking" is being heard more often today. Green banking can benefit the environment either by reducing the carbon footprint of consumers or banks. On-line banking is an example of an initiative of Green Banking. When a bank's customers go on-line, the environmental benefits work both ways.

While green banking can encompass a wide variety of banking services or policies, many banks are actively promoting their online banking services as a form of green banking. The environment and the banking industry can both benefit as more bank customers start to use the online banking services that are available. Benefits of online banking include less paperwork, less mail and less driving to branch offices by bank customers, which all have a positive impact on the environment. Interestingly, online banking can also increase the efficiency and profitability of a bank. A bank can lower their own costs that result from paper overload and bulk mailing fees if more of their customers use online banking. Green banking also can reduce the need for expensive branch banks. Green banking is also gaining importance in recent times. Most of the banks are undergoing computerization, networking, and offering of online banking to customers reduces the use of paper directly and indirectly resulting in pollution control.

Banks can also support eco-friendly groups, offer green lending and raise money for local environment initiatives. Banks that go to these significant lengths to be eco-friendly are a little more difficult to find than the banks that claim to be green by merely offering online services. Banks that offer rate incentives on Certificates of Deposits, money market accounts, online savings accounts and checking accounts for online banking also help the green banking cause by rewarding online banking customers.

All the above developments have definitely helped the transformation of banks in India during the last three decades. There has been a remarkable improvement in the working of banks in terms of cutting costs, increasing productivity, improving the profitability, controlling and management of the Non-Performing Assets (NPAs), face the risks, carry out the Asset Liability Management, manage the changes in interest rates, handle the foreign exchange rate fluctuations, comply with the regulator's requirements and finally improve the customer service to their best satisfaction.

OBJECTIVES

- To know the concept of "Green Banking" in banking sector.
- To know the evolution of technologies towards green banking services
- To give the suggestions to improve green banking services in India.
- To create awareness on the new concept called Green Banking and its benefits to the society.

SCOPE

This study emphasis is on public, private and foreign banks with reference to facilitating green banking services in India. The banks like SBI, PNB, Corporation Bank ICICI, HDFC, HSBC, etc. to be covered for the study.

REVIEW OF LITERATURE

Green banking services helps the banks towards the sustainable developments of the banks. In this context many authors expressed their opinions on the previous and recent developments and trends in the banking sector relating to the green banking.

Jeucken (2001) highlighted important differences between regions, countries and banks with regard to sustainable banking. Jeucken identified four stages: defensive, preventive, offensive and sustainable banking.

Chowdari Prasad (2002) has studied the Impact of Economic Reforms on Indian Banking and suggested how banking sector will face the changes and challenges.

Hopwood, 2005, highlighted the need for change it would be agreed that transformation in the usual model for the sustainable development is essential in order to understand the evolution of the banking sector towards sustainability.

Douglas (2008) found four key findings: (a) banks are increasingly discussing climate change business opportunities in their annual reports, (b) twenty eight of the forty banks have calculated and disclosed their greenhouse gas emissions from operations, (c) growing demand for climate friendly financial products and services is leading banks into new markets, and (d) investment banks have taken a leading role in supporting emissions trading mechanisms and introducing new risk management products.

Nigamanda Biwas (2011) interpreted Green Baking as combining operational improvements, technology and changing client habits in market place. Adoption of greener banking practices will not only be useful for environment but also benefit in greater operational efficiencies, a lower vulnerability to manual errors and fraud and cost reductions in banking activities. He stated that the concept of green baking will be mutually beneficial to the banks, industries and economy. Not only green banking will ensure the greening of the industries but it will also facilitate in improving the asset quality of the bank in future. He has listed several benefits of green banking.

Alice Mani (2011) indicated that as Socially Responsible Corporate Citizens (SRCC), banks have a major role and responsibility in supplementing governmental efforts towards substantial reduction in carbon emission. Bank's participation in sustainable development takes the form of GREEN BANKING.

The author examined and compared the green lending policies of banks in India in the light of their compliance and commitment to environment protection and environment friendly projects. It was opined that Banks in India can implement green lending.

Green Finance or Green Banking refers to diverse financial services and products provided by financial institutions for sustainable development (UNEP FI, 2007).

Green finance was firstly raised at the beginning of 1990's, when the United Nations Environment Program (UNEP) worked with industry to develop environmental management strategies that they were convinced that the financial industry maintaining their businesses might have a significant influence to the environment (UNEP FI, 2010). In fact, this concept has been mentioned for several years. But to date, it has not yet been normatively defined by any international bodies, as it depends on specific financial entity allocating capital to specific purpose with integrating environmental and sustainability factors.

There are some major concerns about environmental issues. Therefore, organization need to pay attention to their outputs whether they are violating environmental issues or not. At SBI Bank, it is believed that profit should not be earned at the expense of the world's most pressing environmental problems. That is why they finance organizations from organic food and farming businesses and pioneering renewable energy enterprises, to recycling companies and nature conservation projects.

Citizens Bank of Canada has lowered its interest rate on loans for carbon emission cars. These kinds of efforts will surely motivate other banks to promote green banking and consequently in long run environmental issues can be resolved.

METHODOLOGY

This is an exploratory research. Data are collected from various sources pertaining to the topic of green banking. Chronological developments in the green banking industry is studied with respect to expansion of branches, implementation of computerization at different levels, opening of ATMs and other green banking services were made to understand the present status of Green Banking in India.

GREEN BANKING SERVICES

Green banking services are the most important services to gain the competitive advantage. S.B.I. is the leading bank in public sector. ICICI is the leading bank in the private sector. Banking sector classification in India is based on the commercial and non- commercial activities. Management information system has been transforming the business by replacing non – green services to green services. The developments in information technology hard ware and software have been making the banking services as more user friendly and eco-friendly. The integrity of information helped the banks to provide the fallowing electronic services.

ATM SERVICES: John Shepherd-Barron devised what is hailed as the world's first automatic teller machine. First ATM in the world was installed by Barclays bank in Londaon in 1967.

First ATM in India was installed by HSBC in Kolkata in 1987

First PSB to install ATM in india is Indian bank.

DEBIT CARD: The first debit cards were introduced in the early 1980's to enable consumers to obtain cash from ATMs by debiting their bank account.

Corporation Bank is the first Indian Bank to introduce debit card.

EVOLUTION OF CREDIT CARD

The evolution process of credit cards has gone through the different stages those are:

THE DINERS CLUB CARD: It was the next step in credit cards. It is used mainly for travel and entertainment purposes, it claims the title of the first credit card in widespread use.

PLASTIC DEBITS

By 1951, there were 20,000 Diners Club cardholders. A decade later, the card was replaced with plastic. Diners Club Card purchases were made on credit, but it was technically a charge card, meaning the bill had to be paid in full at the end of each month.

VISA AND MASTERCARD

As credit card processing became more complicated, outside service companies began to sell processing services to Visa and MasterCard association members. This reduced the cost of programs for banks to issue cards, pay merchants and settle accounts with cardholders, thus allowing greater expansion of the payments industry.

CREDIT CARD

"The general-purpose credit card was born in 1966, when the Bank of America established the BankAmerica Service Corporation that franchised the Bank Americard brand (later to be known as Visa) to banks nationwide," Sienkiewicz writes.

As the bank card industry grew, banks interested in issuing cards became members of either the Visa association or Master Card association. Their members shared card program costs, making the bank card program available to even small financial institutions. Later, changes to the association bylaws allowed banks to belong to both associations and issue both types of cards to their customers.

CHARGE CARD AND NO-ANNUAL FEE CREDIT CARDS

American Express was among the first companies to issue a charge card, it wasn't until 1987 that it issued a credit card allowing customers to pay over time rather than at the end of every month. Its original business model focused on the travel and entertainment charges made by business people, which involved significant revenue from merchants and annual membership fees from customers. While these products are still in its tool chest, the company has developed numerous no-annual fee credit cards offering low introductory rates and reward programs, similar to as traditional bank cards.

THE FUTURE CREDIT CARDS

While the plastic card has been the standard for a half century, recent developments show alternative forms of payment rising to prominence, from online services such as PayPal to credit card keyfobs to chips that can be implanted into cell phones or other devices.

But with the sheer volume of devices in use around America whose sole purpose is to read a flat piece of plastic with a magnetic stripe, the "card" in "credit card" is unlikely to pass from the scene any time soon.

VIRTUAL CARD

A Visa prepaid virtual card is designed specifically for use on the internet.

When customers apply for a Visa prepaid virtual card, customer does not actually receive a physical plastic card. Instead the issuer will generally provide him/her with details of a card account, such as the card number, the expiry date and the security code, that you can then use to make purchases online.

VISHWA YATHRA CARD

State Bank Vishwa Yatra Foreign Travel Card' is a prepaid Foreign Currency Card which travelers going abroad are guaranteed to find useful. It is a Chip based Card which stores encrypted and confidential information.

State Bank Vishwa Yatra Foreign Travel Card is available in Eight Foreign Currencies viz.US Dollars (USD), Pound Sterling (GBP), Euro (EUR), Japanese Yen (YEN), Canadian Dollar (CAD), Australian Dollar (AUD), Saudi Riyal (SAR) and Singapore Dollar(SGD).

GIFT CARD

Gift Card is also a prepaid Indian rupee VISA CARD –an excellent substitute of Gift Vouchers.

GREEN CHANNEL COUNTER

The Bank had launched 'Green Channel Counter'(GCC) facility on State Bank Day (01.07.2010), at 57 select branches of the Bank spread across the country. This was an innovative step taken by the Bank towards changing the traditional way of paper based banking in a limited way, to card based 'Green Banking' focusing on reduction in paper usage as well as saving transaction time. This is a pioneering concept which would save both paper and time resources.

ONLINE BANKING SERVICES

Online banking services are helped the customers to reduce the carbon foot prints indirectly and make the convenience to the customer almost most of the important baking services. Some of these services do not require any manual intervention. Balance Enquiry

- Account Statement
- Fund Transfer to Self Accounts
- Third Party Fund Transfer
- Inter Bank Payee Fund Transfer
- PPF transfer
- Setting up Standing Instruction
- E-Tax Payment
- E-ticketing
- Bill Payments
- Visa Money Transfer
- eZ Trade
- Demat Enquiry
- Online Application for IPO.

MOBILE BANKING SERVICES

Mobile banking also known as M-Banking. M-banking is a term used for performing balance checks, account transactions, payments, credit applications and other banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (PDA). The earliest mobile banking services were offered over SMS, a service known as SMS banking. With the introduction of the first primitive smart phones with WAP support enabling the use of the mobile web in 1999, the first European banks started to offer mobile banking on this platform to their customers.

DISCUSSIONS

Green Banking has been boosting to improve the environment and promoting economic growth. While the quantitative aspects have been tackled through IT intervention for efficient delivery of customer service and ensuring productivity and profitability, the concept of green Banking is deemed to have set in the banking industry, qualitative measures both within the system as also through implementation of certain policies to take care of environmental aspects. To reduce the In this context the study id required to Technological advancements have brought in Green Banking in the banks in India over a period which is certainly healthier in smooth and efficient functioning of the banking sector as also leading to customer satisfaction and clean environment. Green banking services are going to be soon as the strategic developments of the sustainable growth of the banks, banking industry as well as economy.

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IMPLEMENTATION OF DIRECT TAX CODE (DTC): PROBLEMS AND PROSPECTS

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ABSTRACT

The present paper focuses on the implementation of Direct Tax Code, its problems and prospects. Direct Tax Code is a new code and simplified version of an Income Tax Code which would eventually replace five decades old Income Tax Act. If the Direct Tax Code is implemented there will be big changes in taxation and also it is going to impact people in big way. Direct Tax Code can lessen the tax burden. The Direct Tax Code is having the main objective of eliminating the tax exemptions, when the Direct Tax Code is implemented the transitions with the objective of tax benefit can be invalidated by the income tax commissioners. The complexities in the existing tax laws, a need for tax law that can match the rapid economic growth of the country lead the search for new tax law. Direct Tax Code is designed to provide stability in the regime as it is based on well accepted principle of taxation and best international practices. It will eventually pave the way for a single unified taxpayer reporting system. The analysis made with the help of both primary through structured questionnaire and secondary data through various sources. Finally, it attempts to arrive at conclusions and to offer suitable suggestions for the proper implementation of Direct Tax Code for the benefit of entire societal people.

KEYWORDS

Direct Tax Code, Income Tax Code, Principles of Taxation, Tax Benefit, Tax Exemptions.

INTRODUCTION

The Income Tax Act was passed in 1961 and has been amended every year through the Finance Act. A lot of things have changed since then no doubt; many things have been implemented by modifying the Income Tax Act from time to time. Thus the Income Tax Act today is very difficult to interpret and has resulted in many disputes and court cases. Different countries have made several changes in their tax system. These changes were either due to their development strategy or different economic policies. In developing economies the tax system to generally changed to increase the revenue to meet the increasing fiscal deficit. Now such tax system is required which is broad base, simple and transparent as well as which fulfills the international need.

Keeping this in view, there has been proposal to replace the existing Income Tax Act, 1961. Direct Tax Code,2009 is a draft proposal to make existing tax structure easy and simple so that tax payers themselves can compute and file Income Tax return .DTC is designed to provide stability in the tax regime as it is based on well accepted principles of taxation and best international practices. DTC is a new code and simplified version of an Income Tax Code which would eventually replace five decades old Income Tax Act. 12th August 2009, DTC Bill 2009 discussion paper released. If the DTC is implemented there will be big changes in Taxation and also it is going to impact people in big way. An opt statement for the DTC is "Better late than never" DTC which is supposed to replace the old Income Tax Act, 1961 is delaying.

The tax code makes radical changed in all areas of taxation. It lowers the incidence of tax on corporate and individual incomes but reintroduces wealth tax and capital gains tax albeit at lower levels. The basic objective of this tax code is to broad base the tax umbrella. It is expected that the new code will facilitate higher consumerism and thereby promote economic growth. Experts have already started to analyze the proposed changed of the existing direct tax system. The DTC already attain mixed reactions from different corners regarding different changes of the existing tax system. The thrust of the code is to improve the efficiency and equity of the Indian tax system by eliminating distortions in the tax structure, introducing moderate levels of taxation and expanding the tax base. The attempt is to simplify the language, remove ambiguity, provide stability and adopt best international practices.

STATEMENT OF THE PROBLEM

Concept of Assessment year and previous year is abolished only the "Financial Year" terminology exists. Only status of "Non Resident" and "Resident of India" exists. The other status of "Resident but not ordinarily Resident" goes away. In this DTC Government and non – Government Taxation difference removed. All the direct taxes have been brought under a single code and compliance procedures unified. At present, the states of taxes are stipulated in the Finance Act of the relevant year. Therefore, there is a certain degree of uncertainty and instability in the prevailing rates of taxes. Under the code, all rates of taxes are proposed to be prescribed in the First to the Fourth schedule to the code. It is designed to provide stability in the tax regime as it is based on well accepted principles of taxation and best international practices.

Proposal of Direct Tax Code would give more benefit to the upper class group than that of lower group. Charging tax on withdrawals of PPF (Public Provident Fund) and other pension Scheme will have adverse impact on the retirees and pensioners. This would reduce their willingness to contribute less amount of this fund to avoid tax burden. From this proposal loss of revenue for the exchequer and impact fiscal deficit. Tax exemption on LTA (Leave travel allowance) is abolished. Allowances like leave travel, furnishing, entertainment expenditure, conveyance, medical etc., will be added to income from this proposal some of other pains are women will not get any additional tax benefits – fund houses face 5% tax on distribution income for ULIPs, equity-linked MFS. More nonprofits firms will come under the tax net and area based incentives and some of the spectral sops will be discontinued.

OBJECTIVES OF THE STUDY

- To study the awareness of the students about Direct Tax Code.
- To study the effect of DTC on Economy of the country.
- To study role of DTC in eliminating tax avoidance.
- To study Positive and Negative impact of Direct Tax Code.

LITERATURE REVIEW

Vikas Vasal (November, 2009), made a study on **"Direct Tax Code a mixed Bag",** he states that the thrust of the DTC is to improve the efficiency and equity of our tax system and the aim of the DTC is also to simplify the language and the layout of the provisions for a common man to better understand tax obligation.

C.A. Uma Kothari (November 12th, 2010), made a study on **"Direct Tax Code 2010- some suggestions for simplifications and with a long-term perspective",** she has given some suggestion in this article for simplifications for DTC, like she has advised that the provisions (DTC) should be drafted with a long term perspective to cover all Direct Taxes without any doubt or ambiguity and in a simple manner

Satya Ranjan Doley (June, 2010), made a study on **"Direct Tax Code 2009: Boone or Bane",** in this article he has analyze some of the drawbacks of the proposal which need to be taken into account before making it act. i.e., new tax slab, he says that the proposed DTC tax slabs would give more benefit to the upper classes group than that of lower group. **Dr. A Jayakumar and R Elavarasan (March, 2012),** made a study on **"Direct Tax Code An overview",** in this article the

authors are stated that DTC will surely help in the growth of our economy because the tax rate has been reduced for person who earns up to Rs10, 00,000, this reduction in tax may motivate them to contribute that money in the development of economy.

Babar Zaidi (August31st, 2012), made a study on **"DTC proposals",** in this article he stated that DTC and GST which are set to transform the Direct and Indirect Tax structure are aimed to improving compliance by simplifying the tax structure and lowering the tax rates. **M. Govindarajan (September 6th , 2010),** made a study on **"Direct Tax Code Bill Introduced"**, he has stated the new income Slab for individuals under DTC and some of the tax rate for companies like companies can carry forward MAT credit for 15 years.

Subhash Kumar Jha (September 1st , 2010),made a study on **"Direct Tax Code, Lost the original"**, in his article he has said that when the actual proposal for DTC bill was presented, it still gave a very positive signal with some areas of concerns like bringing EET regime for all including PF, MAT based on asset base. **Preeti Pahwa (August 13, 2009),**made a study on **"Direct Tax Code: Tax Liability and You",** in this article the author states that the direct tax code bit of a mixed bag for individuals.

SCOPE OF THE STUDY

Though the study represents the assesses and student awareness, their adoptability and their concern about Direct Tax Code in the district Shivamogga

METHODOLOGY

- **Primary Data -**The second set of data has been collected from primary data, i.e., questionnaire to the respondents and from Income Tax Office Shivamogga.
- **Secondary Data -** For the purpose of the study two sets of date have been collected. One set of data has been collected from secondary sources which includes the journals, circular and notification of central Board of Direct Tax, newspapers and websites.
- **Sample Size and Tools and technique -** Sample size of respondents is of 30 which have been taken by using random sampling technique. The present study based on tools and technique and table, charts and graphs.

TAX STRUCTURE

One of the major changes made in DTC is the existing income slabs for taxation. The changes in comparison with the income tax act of 1961 are mentioned below.

TABLE 1: FOR WORKING MEN AND WOMEN

Rate of tax on income	Income slab as per Income tax act, 1961	Direct Tax Code
Tax free income	Up to 1,60,000 p.a.	Up to Rs 2,00,000 p.a.
10% taxation	Rs 1,60,000 to Rs 5,00,000 p.a.	Rs 2,00,000 to Rs 5,00,000 p.a.
20% taxation	Rs 5,00,000 to Rs 8,00,000 p.a.	Rs 5,00,000 to Rs 10,00,000 p.a.
30% taxation	Rs 8,00,000 and above p.a.	Rs 10,00,000 and above p.a.

Source: www.taxalertindia.com

TABLE 2: FOR SENIOR CITIZENS

Rate of tax on income	Income slab as per Income tax act, 1961	Direct Tax Code
Tax free income	Up to Rs 2,40,000 p.a.	Up to Rs 2,50,000 p.a.
10% taxation	Rs 2,40,000 to Rs 5,00,000 p.a.	Rs 2,50,000 to Rs 5,00,000 p.a.
20% taxation	Rs 5,00,000 to Rs 8,00,000 p.a.	Rs 5,00,000 to Rs 10,00,000 p.a.
30% taxation	Rs 8,00,000 and above p.a.	Rs 10,00,000 and above p.a.

Source: www.finotax.com

TABLE 3: NEW DUE DATES FOR TAX RETURNS

Sl. No.	Type	Date	First filling(under DTC)
1	Non-Business/Non-Corporate	30th June	30/06/2012
2	Others	31st August	31/08/2012

Source: www.taxalertindia.com

ADVANTAGE OF DIRECT TAX CODE

1. **Single code for direct taxes:** The new code envisages a system where all the direct taxes are brought under one single code and a common procedure for them.
2. **Jargon free:** The number of taxpayers in the country is on the rise due to various factors like higher incomes, better technology and stricter enforcements.
3. **Read less, understand better:** Unlike earlier each sub-section will be limited to a couple of sentences and convey only one point. To further simplify the understanding tables and formulae will be used which will give a pin-point explanation of the applicable rule.
4. **Avoid ambiguity**: Ambiguity in terms of interpretation by all stakeholders (taxpayers, collectors and facilitators) will be avoided.
5. **Flexibility:** The new code has been developed to give it the highest levels of flexibility to ensure that any changes occurring due to economic conditions/requirements can easily be imbibed with actually doing any amendments to the rules.
6. **Consolidation of provisions:** All the provisions including definitions, procedures, rates of taxes and incentives have been combined together into one set of documents.
7. **Deregulation:** Earlier, the tax laws were asked to play the secondary role of regulators of various components of the industry.
8. **More stability:** The current system involves the need for a separate finance bill each year to prescribe clearly the prevailing rates for the coming year. This creates a lot of confusion as the tax laws are independent of the finance act of the particular year.
9. **Increase Tax to GDP**

- It means the ratio of tax collection against the national Gross Domestic Product (GDP)
- Right government's tax collection is not optimum, because people get so many tax exemptions.
- Under DTC, men and women are treated same. Women would cease to enjoy income –tax exemptions.

TABLE 4: DIFFERENCE BETWEEN INCOME TAX ACT, 1961 AND DIRECT TAX CODE BILL, 2009

	INCOME TAX ACT, 1961		DIRECT TAX CODE BILL, 2009
1.	At present there are two legislation i.e. Income Tax Act,1961 and Wealth Tax Act,1957	1.	Single code for income Tax Act and Wealth Tax Act. The code consists of 285 sections..
2.	There are three kinds of Residential status i.e. 'Resident' 'Non Resident' and 'resident but not ordinarily resident'.	2.	Residential status of "Resident but not ordinarily resident" has been done away with.
3.	There are 'previous year' and 'assessment year'	3.	To eliminate confusion only 'Financial Year' will prevail.
4.	Date of filing of tax returns 31st July for non-business, Non-corporate assesse and 30th Sept for others	4.	Date of filing of tax return preponed to 30th June for non-business non-corporate assesse and 31st Aug for others.
5.	The corporate tax rate of domestic company is 30% and for foreign company ,it is 40% business losses can be carry forward for 8 yrs. dividend distribution is at 15%	5.	The corporate Tax rate of all companies reduced to 25%, business losses can be carry forward for unlimited period. Dividend Distribution Tax remains at 15%.
6.	MAT at 15% is levied on 'Book Profit'. Further MAT tax credit is allowed to be carried forward up to ten assessment year.	6.	Basis for levy of MAT is 2% on gross assets, carry forward of such MAT tax credit has been denied.
7.	There is no such provision for to declare an arrangements as impermissible	7.	General Anti-Avoidance rule to introduce to empower the commissioner of Income Tax (CIT) to declare an arrangement.
8.	Tax incentives were based on location or on export turnover up to a specified period. Further capital investment were not allowed to amortized	8.	All capital investment and revenue expenditure allowed to be amortized indefinitely and the period of such amortization will be called as Tax Holiday'
9.	Income from salary includes all perquisites such as house rent, leave travel assistance, children education allowances, encashment of unaveiled earned leave on retirement, medical reimbursement and free/concessional medical treatment paid/provided etc. is exempt up to a certain limit.	9.	All such exemption withdrawn.
10.	As per 80C certain investment/saving up to Rs 1 lack were deductible from taxable income.	10.	Exempt Exempt-Taxation (EET) method of taxation of savings/investment, will be applied on new contribution after commencement of the code.
11.	Self occupied house property whose gross rent is taken as NIL, used to get deduction for repair based on annual value in case of rented house property is 30%	11.	Self-occupied house property whose gross rent is taken as NIL, will not get deduction of interest on loan. Deduction for repair on annual value in case of rented house property is proposed to reduce to 20%.
12.	There is no such provision for upfront determination of the arm's length pricing or pricing methodology.	12.	Transfer Pricing matter will be well settled under proposed Advance Pricing Agreement (APA), under which an agreement between the taxpayer and the tax authorities for the upfront determination of the arm's length pricing/pricing methodology of an international transaction will be made but shall not be effective for more than five consecutive years.
13.	As per IT Act 1961 loss on sale of business capital assets will be treated as short term capital loss and will be allowed to be carried forward up to 8 assessment years.	13.	As a disincentive to asset stripping and loss manipulation, the loss on sale of business capital assets will be treated as intangible asset and depreciation will be allowed at the same rates applicable to the relevant block of assets, therefore allowing a fraction of the loss every year.
14.	There is provision of choice between Income Tax Act and Double Taxation Avoidance Agreement, whichever is beneficial to the assesse.	14.	The code states that neither a Double Taxation Avoidance Agreement (DTAA) nor the code shall have a preferential status by reason of its being a DTAA or law. However in case of a conflict between the code and DTAA, the one that is later in point of time shall prevail.
15.	Carry forward and set-off of losses of unlisted companies in the hands of amalgamated company will lapse with change in shareholding of 50% or more.	15.	Such carry forward and set-off of losses will not lapse even with change in shareholding of 50% or more.

Source: www.simpletaxindia.net

HIGHLIGHTS OF DTC

1. MAT will be calculated on 'Book Profit' as against the 'Value of Gross Assets'
2. Salary - Exempt Exempt Exempt (EEE) scheme will be applicable for GPF, PPF, RPFs, Pension Scheme, Approved pure life insurance products and annuity schemes instead of Exempt Exempt Tax(EET)
3. Retirement Benefits Account scheme not to be introduced
4. Amount received under Gratuity, voluntary retirement scheme, commutation of encashment of leave will be exempt, subject to specified limits, for all employees
5. Rules for valuation of perquisite to be made
6. Rent free accommodation will not be taxed at market value
7. House Property - Rent - Gross rent will not be computed at a presumptive rate of six per cent of the ratable value or cost of construction/acquisition.
8. In case of house property which is not let out, the gross rent will be nil.
9. In case of self occupied property exemption upto 1.5 Lakhs will be allowed
10. Capital Gains - Income under the head 'Capital Gains' will be considered as income from ordinary sources in case of all taxpayers including non-residents.
11. Listed equity shares or units of an equity oriented fund held more than one years will be computed at adjusted rate (a deduction will be allowed)
12. Capital gains on other assets held for more than one year will be computed on indexed cost method basis (base year will be 1.4.2000)
13. Income arising on purchase and sale of securities by an FII will be deemed to be income chargeable under the head 'capital gains'
14. Non-Profit Organization (NPO) - No fresh registration is required for existing NPOs
15. The income of a public religious institutions and income from charitable activities of the trust / institution will be exempt but donor will not be eligible for deduction on account of donation
16. 15% (or 10%) carry forward of surplus will be allowed
17. Donation from NPO to NPO will be considered as application of income
18. Basic exemption limit will be provided to NPOs
19. SEZ units -to protect profit linked deductions of units already operating in SEZs for the unexpired period will be incorporated.
20. Company incorporated outside India - Place of effective management' to be defined
21. Passive income earned by a foreign company which is controlled directly or indirectly by a resident in India will be taxable
22. DTAA - DTAA will not have preferential status over the domestic law in the following circumstances:- (i) when the General Anti Avoidance Rule is invoked, or (ii) when Controlled Foreign Corporation provisions are invoked or (iii) when Branch Profits Tax is levied.
23. Wealth Tax - wealth tax will be payable by all taxpayers except non-profit organizations on all unproductive assets
24. General Anti-Avoidance Rule to be implemented with the forum of Dispute Resolution Panel (DRP)

ANALYSIS AND INTERPRETATION OF DATA

The following table shows the socio-economic data about the respondents:

TABLE 5: SOCIO-ECONOMIC DATA ABOUT RESPONDENTS

Sl. No.	Particulars	No. of Respondents	%
1.	**Gender of the Respondents**		
	Male	22	73.3
	Female	08	26.7
Total		**30**	**100**
2.	**Age**		
	20-25	8	26.7
	26-30	6	20
	31-35	4	13.3
	36-45	5	16.7
	46 and above	7	23.3
Total		**30**	**100**
3.	**Education Level of the Respondents**		
	Graduations	5	16.7
	Post-Graduation	12	40
	Professionals	9	30
	Others	4	13.3
Total		**30**	**100**
4.	**Occupation of the Respondents**		
	Student	6	20
	Auditor	5	16.7
	Professionals	10	33.3
	Others	9	30
Total		**30**	**100**
5.	**Income of the Respondents**		
	Below Rs 2,00,000	7	23.3
	Rs2,000,00 – Rs 5,00,000	11	36.7
	Rs 5,00,000-Rs 10,00,000	9	30
	Above Rs 10,00,000	4	13.3
Total		**30**	**100**
6.	**Account status of the respondents**		
	Yes	50	100
	No	0	0
Total		**30**	**100**
7.	**Awareness about DTC among respondents**		
	Yes	27	90
	No	3	10
Total		**30**	**100**
8.	**Preference of the Tax system of the Respondents**		
	Income Tax Act	7	23.33
	DTC	23	76.7
Total		**30**	**100**
9.	**Opinions of the Respondents towards Income Tax systems for Economic Progress**		
	Yes	11	36.7
	No	19	63.3
Total		**30**	**100**
10.	**Respondents opinions about increase the revenue by DTC**		
	Yes	24	80
	No	6	20
Total		**30**	**100**
11.	**Benefits from proposed DTC**		
	Upper Class	10	33.3
	Lower Class	3	10
	Both	17	56.7
Total		**30**	**100**
12.	**Year of implementation of DTC**		
	FY 2013-14	1	3.37
	FY 2014-15	6	20
	FY 2015-16	3	10
	FY 2016-17	7	23.3
	Above FY 2017-18	13	43.3
Total		**30**	**100**
13.	**Reduction of Double taxation from DTC**		
	Yes	25	83.3
	No	5	16.7
Total		**30**	**100**
14.	**Incremental savings in tax in DTC**		
	Yes	24	80
	No	6	20
Total		**30**	**100**
15.	**Reason for delaying for implementation of DTC**		
	Preparing for major changes	6	20
	DTC needs fresh look	12	40
	Criticisms from others	12	40
Total		**30**	**100**

Source: Field Survey

From the above table it is clear that male respondents are more than female respondents and they belong to the age group of 20- 25 years. Moreover they are almost professionals. They prefer DTC as compare to Income Tax Act. According to the respondents opinion, proposed DTC will helps to both upper and lower class people and it is helpful to reduce the double taxation and it will leads to incremental savings in tax.

FINDINGS OF THE STUDY

- It is observed that majority of the respondents are male as DTC is more popular among the male. More number of the respondent's age is between 20-25 years so young people are more aware about Direct Tax Code
- Most of the respondents have completed their PG course. Majority of the respondents are professionals and businessmen
- Majority of the respondents comes under the Income level of Rs. 200000- Rs. 500000. The study reveals that most of the respondents are aware about DTC
- As per the survey much preferable tax system by the respondents is to DTC than IT Act. With the help of the study it is founded that, implementation of DTC will increase the revenue to meet the fiscal deficit
- It is found from the survey that implementation of DTC gives favorable effect to the majority of the respondents
- Majority of the respondents agree that implementation of DTC will bring more effectiveness, efficiency and equity in the Direct Tax system by eliminating distortions in the tax structure. It is found from the survey that proposal of DTC will be beneficiary for both upper class and lower class
- It is observed that Government of India is making delay in implementing the DTC therefore most of the respondents opined that it may be implement after FY 2017-18
- Majority of the respondents opined that implementation of DTC will reduce double taxation. Large number of respondents opined that implementation of DTC increases the saving in tax
- It is found from the survey that implementation of DTC will increase GDP in Indian economy. DTC need fresh look & criticism from others are the major finding for the delay in implementation of DTC

SUGGESTIONS OF THE STUDY

- The Department has to give training to be imparted on the income tax officials on both income tax software and the law itself
- Government of India has to take a appropriate step to educate the taxpayer, auditor, others relating to DTC
- Tax authorities need to be educated regarding the DTC
- The Government of India has to take a required step to implement DTC as early as possible, because implementation of DTC will bring uniformity tax system which helps to economic progress of our country
- In order to help the people Government can increase taxable slabs (until a certain point),and reduce tax rates
- Government of India has to settle the disputes of created regarding DTC and implement DTC because everyone is eagerly waiting for the new type of tax system.
- It has to considered all type of tax payee and give justice to all class of people

LIMITATIONS OF THE STUDY

It is not possible to collect the accurate information because it is not yet implemented and it is difficult to collect the opinions from the people because majority of the people doesn't know the concept of DTC.

CONCLUSIONS

When the first draft of DTC i.e., Direct Tax Code 2009, which had more than 5000amendments to the current tax system, Income Tax Act 1961,was opposed by all stakeholders, but the second draft, Direct Tax Code 2010, was introduced with the various favorable changes which helps to the individual taxpayer and also for corporate then many stakeholders welcomed it, it still has not yet satisfied majority of the corporate houses. Here it must also be noted that when Government implement VAT in 2005. It was widely criticized by many but it is moving successfully

The code aims to reduce tax rate which seems to be a very positive and progressive initiative from the government. The delay in implementation of the bill. The implementation of the proposed DTC should reduce both tax evasion and costs of compliance and should eliminate most of the distorted behavior coming from tax avoidance. The government will need to ensure the provisions of the DTC to be implemented effectively and successfully to safeguard the country's long term ambitions. The DTC in India is very much discussed and criticized now a day, even though, the basic aim behind DTC is simple and helpful to the people. It will surely help in the growth of our economy because the tax rate has been reduced for person who earns up to ten lakhs. This reduction in tax may motivate them to contribute their money in the development of the economy, like establishing business firms, building hotels etc., which play major role in the growth of economy.

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SERVICE QUALITY AND CUSTOMER SATISFACTION OF PEOPLE'S BANK IN JAFFNA DISTRICT

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ABSTRACT

In this competitive commercial world, an organization has to satisfy the needs and wants of the customers, and has attracted new customers, and hence enhances their business. Customer value is considered as a control element for all business strategies. Therefore, every organization has to emphasize on customer satisfaction. As far as the banks are concerned this phenomenon is very prominent. When compare with other districts, in Jaffna district the banking sector has to improve and modulate their services. This Study attempts to identify the determinants of the customer satisfaction in the People's Bank of Sri Lanka. The finding indicates that service quality is more important in determining satisfaction than other factors of the different service quality dimensions, empathy, assurance, reliability, responsiveness, tangible are found to be more important than other dimensions. To carry out this research, I defined the hypotheses as "if the people's bank provides the service quality effectively, it will perform higher customer satisfaction" and by selecting appropriate and effective service quality, the customer will get higher satisfaction". By this analysis of collected data, there hypotheses were accepted. That is empathy, assurance, reliability, and responsiveness, tangible and over service quality have strong impact on customer satisfaction, and positive relationship between service quality and customer satisfaction.

KEYWORDS
Service Quality, Satisfaction

1. INTRODUCTION

The starting perspective is that banks are firms in the traditional economic sense of the term and operate in a wide range of competitive markets. They are multi product firms in that they supply a wide range of on-and-off balance sheet services and products. In many senses a bank is a conglomerate market for a wide range of services with sometimes substantial degrees of bundling between them. Some of the services of banks are produced on a joint basis and share substantial resources on a common basis. Not only is the supply of services frequently undertaken on a joint basis. Customer demand for services is often interrelated. A bank is both a financial intermediary, and also a supplier of on-and-off balance sheet services. This diverse range of services complicates the allocation of costs and pricing with in the firm The banking sector in Sri Lanka grew rapidly speed in the last decade of the past century. Along with its important to the country's economy, the level of competition has also increased. In order to face the competition, banks appear to be introducing new features for both deposit and loan products at competitive rates. Attention has also been paid to improving access with expansion of ATMs and branch networks and improvement of electronic banking facilities such as telephone and internet banking.

All activities have the most competition in the world. In the way, there is no exemption to banking activities. They face the basic changes because of the technology changes, improvements and introduction of the complicated financial plan and globalization. These activities created many challenges to the state commercial bank and help to the most opportunities. For it, they have to compete with private banks in this way, state commercial bank improve their services through the new technologies improvement and changes of management system.

There are two state commercial banks in Srilanka. Such as people's bank and bank of Ceylon. For my study, I take only people's bank. Technology improvements are becoming step by step to branches in Jaffna. Every time, they improve their services. Because they can define their services for the want of customers. If not, they can leave their customers. Customer wants are increasing time to time. So to fulfill their services, bank introduces new plans and services. Now days, customer satisfaction is the most important factor to the banking sectors.

Identification of customer's needs, wants and their expectation helps banks to satisfy customers. Quality services are the major tools used by the banks to achieve this purpose. Quality customer service is the value added offering that provides a more satisfying experience, which creates the customer relations and retention. It is essential in building long term loyalty, and "word of mouth publicity". In this way quality customer service wins customer approval and generates profits. Good customer service is what the customer sees in a product or service. At the same time the customer may not say what he wants, but bank should have the ability to anticipate what he really expects from bank. Robert Gabrin, chairman of the Motorala Inc (cited in Bankers Journal Sep 2003) identified four levels of acceptable services. "GOOD", "VERY GOOD", "MERE PERFECT", and "WOW". "WOW" occurs when the experience exceeds far beyond the expectation. In this situation, the customer is astonished by the service. This experience is never forgotten and builds a very positive perception on the organization. This is very important. Because ultimately perception becomes "reality" in the business world. According to this statement, customer perception is very important.

Because of this, the customer driven banker should have special techniques to identify the above mentioned consumer perception. Marketing research or communication methods of interaction between customer and frontline staff members or any other information sources should be created at branch level to implement this purpose. Some banks have appointed frontline contact officers to collect feedback information from the customers about their service offerings. Whilst rendering quality service, building the perception on the consumer's mind is also very important, because "the word of mouth popularity" and "moment of truth" are the ultimate results created by a bank through unexpected services rendered.

Quality service is not an activity a banker should deliver according to a set of guidelines. Changes in consumers' mind and the environmental forces influenced the quality service to become as a value added process, which should be developed through innovation and creation in every moment. As a result of 'Paradigm shift' from mass marketing to one-to-one marketing (customization), quality service has become a big challenge for customer driven bankers to face the present and future business world.

2. OBJECTIVE

- To find out the relationship between Service quality and customer satisfaction.
- To find out the impact on service quality and customer satisfaction.

3. RESEARCH PROBLEM

People's bank also provides the services for the peoples in Jaffna region in any complicated situation. These customer services are useful all level of people in any time. In this study focused here is,

"Service Quality which is provided by the people's bank leads to satisfy the customer".

4. HYPOTHESIS STUDY

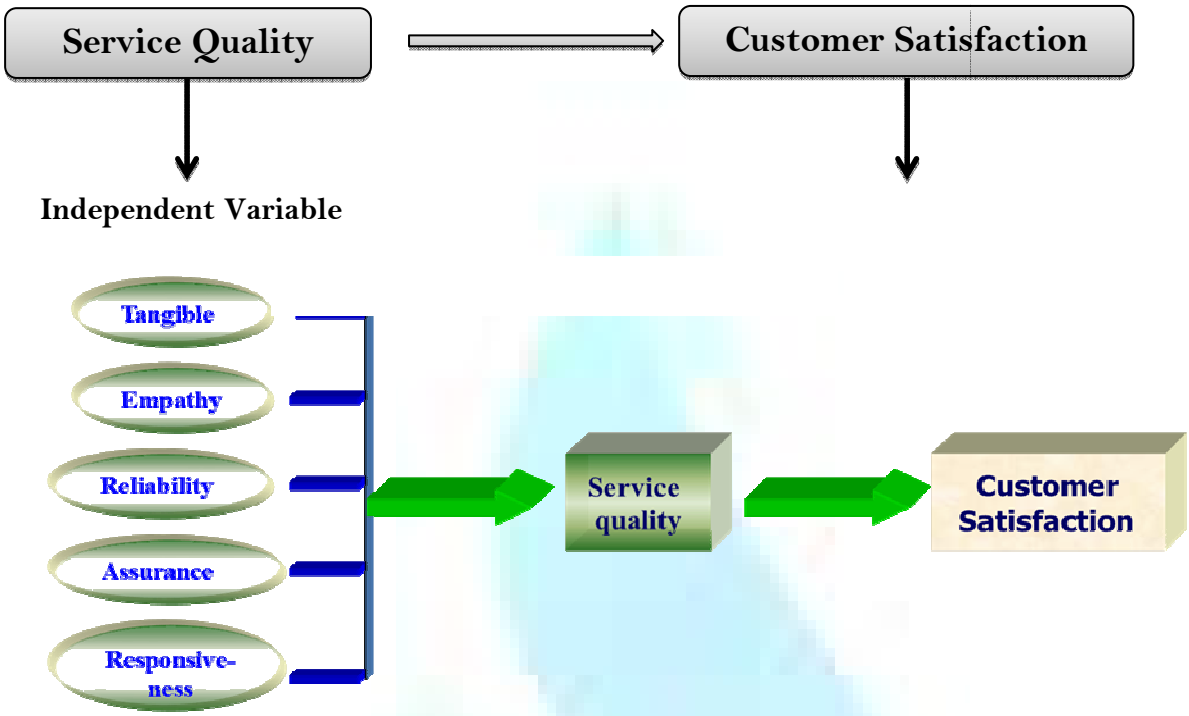
Based on causal relationship given in the conceptual model. The following hypothesis were developed for testing

H1: Service quality has impact on Customer satisfaction.
H2: There is positive relationship between Service quality and Customer satisfaction.

5. CONCEPTUALIZATION

A conceptual model was formulated to simplify the process of revealing the variables and hypothesized relationships concerned in the study.

FIGURE 1: CONCEPTUALIZATION



6. RESEARCH DESIGN AND METHODOLOGY

6.1 RESEARCH SAMPLE

The sampling procedure was purposive. Much of the data collection was conducted using a convenience method. It was decided to distribute about half of the questionnaires among customers of bank. The rest were distributed and collected via friends and acquaintances. However, the questionnaire contained a number of questions pertaining to demographic details of respondents. These were used as screening questions and only the questionnaires that conformed to the requirements of pre-determined sample profile were selected for analysis. The sample size was pre-determined sample profile were selected for analysis. The sample size was decided as 100 respondents and it was decided to distribute 120 questionnaires to allow for non-response.

The sample comprised respondents from different occupations. The majority were government servants. While the rest represented different professions such as students, business man, pensioners. The sample also represented customers of all key branches of people's bank operating in the Jaffna district. Five branches were represented in all. While the majority were customers of two banks.

It is important to state that although the researcher ensured that all key branches of people's bank of the region were represented in the sample, response were not analyzed in relation to individual branches. This is because the researchers focused in identifying satisfaction determinants of people's banking customers in general, and were not interested in an evaluation of the performance of individual branches.

6.2 DATA COLLECTION

The data collection was primary through a self –administrated questionnaire comprising of range of multiple-choice questions. This questionnaire was developed based on Parasuraman et al SERVQUAL model. A part from this, that questionnaire contains three Part.

Second data from sources as people's bank annual reports, management journals, past research articles, banker's journal, economic review, down loaded reports from website and other published information sources are used. The research questionnaire to be used will be designed taking into account the variables that are to be measured.

6.3 METHOD OF DATA ANALYSIS

After collecting data the researcher should be analysis this verify of techniques. In this study Percentage, correlation and regression techniques are selected to analysis. Therefore researchers have to explain about these techniques.

7. LITERATURE REVIEW

7.1 SERVICE

Service is intangible components of products. Increasingly customers are demanding a mixture of the both goods and service. The service industry has gathered momentum since of late, with increasing demand from customers for a better service. Organizations have gone that extra mile to satisfy the customers' care and customer relationship management (Bitner and Hubbert, 1994). A service can defined as "a service is any activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product" (Philip Kotler, 2005).

The emergence of the service sector has been suggested by economic dominance changes first from agriculture to manufacturing and then to service. It is argued that if income elasticity of demand is higher for services than it is for goods, then as income rise, resources will shift to word services verifies and is further explained by change in culture, health, fitness, safety demography and life styles.

In considering the design of service, it is important to consider the difference between goods and services. Some authors argue that the marketing and design of goods and service should conform to the same fundamental rules. Whereas others claim that there's need for different approach to services. Because of the differences which can be recognized in the goods and services themselves.

7.2 SERVICE QUALITY

The first important factor which is concerned in this research is service quality. Service quality has the high degree of variations that this is the result of the comparison that customers make between their expectations about a service and their perception of the way the service has been performed (Grönroos, 1984; Parasuraman et al., 1985, 1988). At a higher level, and essentially from a customer's perspective, they see quality as being two dimensional, consist of

output and process quality. Moreover, the model proposed by Grönroos (1984,1990) highlights the role of technical or output quality and functional or process quality as occurring prior to, and resulting in, outcome quality. This concerns both psychological and behavioral aspects that include the accessibility to the provider, how service employees perform their task, what they say and how the service in done.

Conceptual model concerning perceived service quality was proposed by Parasuraman et al. (1985), service quality has become an area of interest in marketing research (e.g. Cronin and Taylor, 1992, 1994; Parasuraman et al., 1988). Through an empirical test, Parasuraman et al. (1988) developed SERVQUAL from a modification of the ten dimensions proposed in 1985 to 22 items/five dimensions in 1988: tangibles, reliability, responsiveness, assurance, and empathy.

1. Tangibles-includes the company's or service provider's physical facilities, equipments, dressed of their employees and communications material.
2. Reliablility-refers to the ability of the service provider to perform the service accurately and dependably' as promised.
3. Responsiveness-refers to the willingness of the firm's staff to help customers and to provide the requested service prompt.
4. Assurance-refers to the knowledge and courtesy of the company's employees and their ability to inspire trust and confidence in the customer towards the service company.
5. Empathy-refers to the ability of the service provider to provide a caring and personalized attention to each customer.

In their study, the data on the 22 attributes were factor analyzed and resulted in five dimensions. Several researchers examined the properties of the SERVQUAL scale using data from the consumer sector. While some of them questioned the five- factor dimensionality of the SERVQUAL scale, others provided it support (Parasuraman, 1991). The usefulness of the gap scores to represent service quality was also questioned by some researchers on conceptual and empirical grounds. For example, Brown et al. (1993) showed that gap scores in general demonstrate poor reliability. The construct validity of gap scores is also suspected because gap scores would have a theoretically high correlation with their component scores (e.g. perceptions and expectations). As a result, gap scores are not likely to be distinct from their component scores. Further, Brown et al. (1993) suggested that gap scores suffer from "variance restriction" problems that would prevent their usage in certain types of statistic analyses. Cronin and Taylor (1992) showed that the perceptual components of SERVQUAL outperformed SERVQUAL gap scores in predicting overall service quality, suggesting that service quality is better measured by perceptions than by gap scores.

There are many previous researches that concern on service quality. Cronin and Taylor (1994) find that service quality has a positive impact on customers repurchase intentions and intentions to recommend the company to others. Besides, the most comprehensive study in this field, by Zeithaml et al. (1996), determines that service quality influences different intentions, such as giving recommendations, doing more business, and willingness to pay more. Service quality contributes very strongly to the maintenance of long-term customer relationships. Its impact on customers' commitment was found to be stronger than the impact of trust, which is regarded as a key-mediating variable in other business relationships (Venetis and Ghauri (2004). Moreover, Caruana (2002) demonstrated that service quality is found to act on service loyalty via customer satisfaction and show that while gender and marital status provides no basis for differentiation among constructs; education and age play a major role in determining the different perceptions of customers.

In international market Eriksson, Majkgard and Sharma (1999) showed that good customer relationships and good industry relationships have a positive influence on supplier perception of service quality. Good relationships with other firms are an asset, and that service supplying firms perceive that these relationships help them to supply quality services (Eriksson, Majkgard and Sharma, 1999). Moreover, Durvasula, Lysonski and Mehta (1999) suggested that that successful relationship marketing in the service sector is facilitated by knowledge about customers' perceptions of the quality of the service. Though service quality measures have been developed and widely tested for consumer services, it is not known whether these measures possess sound psychometric properties when applied in the business-to-business context. Durvasula, Lysonski and Mehta (1999) showed that the perception scores provide a better measure of service quality than the gap scores, based on composite reliability, fit indices, and correlation indices. Further, tests for dependent correlations indicate that the perception scores provide a better ability to predict overall evaluation of service than the gap scores. However, the gap scores were found to be distinct from the perception scores, implying that the gap scores do have a useful role to play in identifying the areas of weakness for an organization wherever the gaps in service quality are high and the relative strengths wherever the gap scores are small. In sum, the service quality measures developed for consumer services can only be applied with caution in business-to-business marketing (Durvasula, Lysonski and Mehta, 1999)

Johnston (1997) A second research by Johnston used a convenience sample of 223 bank customers in the UK to identify the service quality dimensions that are important to customers. Johnston used 18 quality dimensions previously identified by the same researchers. All 18 dimensions have been found to be of at least some minor importance. Competence, attentive help, reliability, communication and responsiveness are identified as the most important (in order of importance). These findings are close to the claims of Parasuraman et al, (1988) that reliability and responsiveness are the important service quality dimensions.

7.3 IMPORTANCE OF SERVICE QUALITY

Despite the importance of providing a high level of quality to be successful in today's very competitive marketplace, the concept of quality is an elusive construct mainly because of the presence of many intangible attributes. This difficulty gets worse when it comes to service quality.

The services are concerned; marketing cannot operate in isolation from other functional areas. Tasks that might be considered the sole preserve of operations in a manufacturing environment need to involve marketers because customers are often exposed to – even actively involved in – service processes. Making service processes more efficient does not necessarily result in a better – Quality experience for customers; nor does it always lead to improved benefits for them. Likewise, getting service employees to work faster may sometimes be welcomed by customers but at other times may make customers feel rushed and unwanted. Thus, marketing, operations, and human resource managers need to communicate with one another to ensure that they can deliver quality experiences more efficiently.

An individual customer's perception usually determines his/her future attitude and actions toward a service provider. Dissatisfied customers will eventually leave the company and may never come back. The aggregate of all the customers' decisions regarding their service provider will determine the market share of the service provider. Another measure of performance of a service provider is each service provider's distribution of customers in terms of length with the provider. Many recent articles underline the importance of loyal and long-term customers since they usually bring in more sales, often at increased profit margins. If loyal customers defect, the profit-making potential goes with them. Similarly, implementing marketing strategies to improve customer satisfaction with services can prove costly and disruptive for an organization if the implications for operations and human resources have not been carefully thought through. Hence, quality strategies need to be considered carefully.

Marketing's interest in service quality is obvious when one thinks about it: Poor quality places a firm at a competitive disadvantage. If customers perceive quality as unsatisfactory, they may be quick to take their business elsewhere. Recent years have witnessed a veritable explosion of discontent with service quality at a time when the quality of many manufactured goods seems to have improved significantly. From a marketing standpoint, a key issue is whether customers notice competing suppliers' differences in quality. Consultant Brad Gale puts, it succinctly when he says that "value is simply quality, however the customer defines it, offered at the right price" (Bradley T.Gale, 1994).

Improving quality in the eyes of the customer pays off for the companies that provide it. Data from the PIMS (Profit Impact of Market Strategy) show that a perceived quality advantage leads to higher profits (Robert D. Buzzell and Bradley T.Gale, 1987). Quality is a path to creating value for both customer and companies. In broad terms, quality focuses on the benefits created for the customer's side of the equation. Carefully integrating quality and productivity-improvement programs will improve the long term profitability of the firm.

7.4 CUSTOMER SATISFACTION

For this part, we show the second important factor for this research, it is customer satisfaction. In the satisfaction refers "expectations reflect anticipated performance make by customer about the levels of performance during a transaction" (Churchill and Suprenant, 1982). Furthermore, service quality is influenced by customer satisfaction (Bitner, Hubbert, 1994) much more convergence evolves upon satisfaction representing. Satisfaction is defined as an emotional post-consumption response that may occur as the result of comparing expected and actual performance (disconfirmation),or it can be an outcome that occurs without comparing expectations (Oliver, 1996). Moreover, "Satisfaction is based on the extent to which customers perceive the service episode to have met, fallen short, or exceeded their expectations (Nicholls, Gilbert and Roslow, 1998). When performance is less than expected, the organization

experiences detrimental effects. When customers are satisfied, the organization may be performing well. When customers are delighted, they come back, and frequently become an organization's best advertising/marketing tool" (Nicholls, Gilbert and Roslow, 1998).

There are many previous researches that talk about customer satisfaction. Bennett and Rundle-Thiele (2004) demonstrated in their research, satisfaction and loyalty are not the same, and in some cases satisfaction does not predict loyalty (consider banks where customers are highly dissatisfied yet remain loyal). This suggests that marketing managers need to test both customer satisfaction and loyalty.

Financial service organizations might also consider the contribution of Johnson, Silvestro, Fitzgerald and Voss (1990) and Silvestro and Johnson (1990), investigating service quality in U.K organizations, who identified fifteen dimensions of service quality which they categorized as: hygiene factor- expected by the customer and where failure to deliver will cause dissatisfaction.(eg; carrying out instructions with respect to standing orders, confidentiality of financial affairs, lack of queues and return of telephone calls) enhancing facts, which lead to customer satisfaction but where failure to deliver will not necessarily cause dissatisfaction (eg; bank clerk addressing you by name) and dual threshold factors where failure to deliver will cause dissatisfaction and delivery above a certain level will enhance customer's perceptions of service and lead to satisfaction (eg; explanation of a mortgage service repayment level, interest charges, payback period, and other relevant conditions).

Their findings are that the key explanatory variables of satisfaction are in the service quality domain. Both core and relational performance have been found to be significant determinants. In addition, satisfaction with problem recovery has also been found to play a key role. Further, a bank's features and competitive rates have also been identified as being key drivers of satisfaction.

7.5 THE IMPORTANCE OF CUSTOMER SATISFACTION

The importance of customer satisfaction cannot be overstated. Without customers. The firm has no reason to exist every service business needs to proactively define and measure customer satisfaction. Waiting for customers to complain in order to identify problems in the service delivery system or giving the firm's progress in customer satisfaction based on the number of complaints received is naive.

7.6 THE RELATIONSHIP BETWEEN SERVICE QUALITY AND CUSTOMER SATISFACTION

While a strong positive correlation between service quality and satisfaction has been acknowledged, there is considerable debate regarding the direction of the relationship.

According to Rust and Oliver (1994), Perhaps the intriguing issue facing service markets today is the interplay between quality, satisfaction and value. Specifically, which are antecedent, which are mediating and which are consequent? To date no definitive answer exists.

Marketers must interact at all levels within an organization to ensure consistent objective and adequate resources. Many people working in business environment are down to a career in marketing. They are often already familiar with some fundamental concepts such as important of identifying customer and customer's satisfaction. They understand that quality and meeting customer needs and measuring customer care are vital to success in any business environment and they want to know more about the total concepts of service quality and customer satisfaction.

Customer satisfaction is closely linked to quality. In recent year many companies have adapted Total Quality Management (TQM) programmers designed to constantly improve the quality of their products, services and marketing processes. Quality has a direct impact on customer satisfaction. In the narrowest sense, quality can be defined as "freedom from defects" but most customer centered companies go beyond this narrow definition of quality. Insured they defined quality in terms of customer satisfaction.

The American society for quality control for quality defines quality as the totality of features and characteristics of product or service that bear on its ability to satisfy customer needs. This customer focused definition suggests that a company has achieved total when its product or services met or customer expectations. This the fundamental aim of today's total quality movements has become total customer satisfaction. Quality is beings with customer needs and with customer satisfaction.

The quality of services is important note only for users but also for suppliers. For manufacturers, quality deficiencies result in additional cost for inspection, testing, scrap, re-work and the handling of complaints and warranty claims. In the so-called service industries, an error, checking, enquires and complaints account for losses in efficiency and productivity, quality must therefore be taken into account throughout all the areas of marketing, designing purchasing, production of operations' and distribution.

It must be controlled in all those function, and their activities co-ordinate to achieve a balanced corporate quality performance. Quality performance will not just happen; effective leadership and team work is the only sure recipe for success. Real understanding and commitment by senior management, together with explicit quality policies, lad to improvement throughout the entire organization, which in turn generates momentum for the improvements f products, services and performance.

Achieving quality relies upon consideration of both the external environment and the internal resources; the identification of the customer's requirements must be matched by ability to generate a service which will be recognized as satisfying the needs. In the event of a conflict between these two determinants, the intended market segments may have to be changed or the internal resources may have to be re-examined. A word warning; the customer's perception of quality changes with time and any organization's attitude to quality must change with this perception.

The skill and attitudes of the producer are also subject to change and failure to monitor such changes will inevitably lad to dissatisfied customers. Quality like all other corporate matters must be continually in the light current circumstances, many authors (Reicheld and Kenny, 1990; Zeithaml et.al 1990; Bowen and Lawler, 1990; Schlesinger and Heskett, 1991) have citedthe relationship between customer satisfaction and the quality of service experienced by the customer.

Parasuraman "et.al (1984) studied quality in four services businesses, including card service and developed a model of service quality. They noted that "A variety of factors, including resources constraints. Management perceptions of customer expectation and the firm service quality specifications will effect service quality from the customer's view point, a well-known researcher in the service area, a professor parasuraman, noted that quality service is when one needs or exceeds the customer's expectations. He said usually when customer take about quality service they want it to be reliable and for the business to deliver what was promised. As the old adage goes," Surprisingly, Parasuraman also said customers generally expect employees themselves to be clean as well as accurate and empathic. Obviously through the definition of service depends on one's customer's expectations.

According to the "Yakelovich Clancy sulman pollakn" in the spring of 1990, Americans rank quality's components in this order; reliability, durability; easy maintenance, case of use, a known or trusted band and finally a low price. The conclusion is that people will send more to get more."Michel D.Einser; CEO of Walf Disney" says, "I think in terms of decades" Long term market share management works and delivery or higher quality service is certainly one way to insure long- term prosperity.

Schlesingwar and Hesktt (1991) suggested that poor service was often built into the system by designing customer conduct jobs to be "idiot proof". Bitran and hoch (1990) differentiated between transaction-oriented, "Low conduct", service , in which quality can be defined as "conformance to specification" and "high contract "service, such as customer , retention, that satisfy higher order human needs. They proposed that "activity understanding and managing the relationship between server and customer can yield higher service revenues through increased repurchase rates".

Zeithaml "et.al(1990) studied whether customers perceptions of quality were influenced by whether or root they experienced recent service problem. They examined customers who had experienced recent services problem and those who had root. They fund that service problem adversely affect customer's perception of service quality and that customers who were dissatisfied with the resolution of their problems were twice as dissatisfied as those whose problems were resolved to their satisfaction.

8. RESULTS AND DISCUSSIONS

Any research is carried out in order to find out truth with the aid of presented data, and data analyzed by using statistical tools, the research was able to bring some findings. These findings are provided based on the selected banks' customers. Following are some of the findings.

The correlation test was made to examine the relationship between service quality (empathy, assurance, reliability, responsiveness, tangible) and customer satisfaction (indicate in table 4.7) at 0.01 significant level. This table indicates the correlation value to customer satisfaction related to empathy is 0.758**,

assurance is 0.725**, reliability is 0.818**, responsiveness is 0.703** and tangible is 0.660**. It indicates the high positive relationship. The correlation between overall service quality and customer satisfaction is 0.849**. And over all relationship between service quality and customer satisfaction also has the high positive relationship. Based on the above correlation analysis that there is a linear positive relationship between service quality (empathy, assurance, reliability, responsiveness, and tangible) and customer satisfaction, in these based, the hypothesis 2(H2; There is positive relationship between service quality and customer satisfaction) is accepted.

Based on the regression analysis, r2 value between customer satisfactions related to empathy is 0.575, assurance is 0.525, reliability is 0.669, responsiveness is 0.494, tangible is 0.435 and overall service quality is 0.721. This means 57.5% variance of customer satisfaction is accurated by the empathy, 52.5 % variance of customer satisfaction is accurated by the assurance, 66.9% variance of customer satisfaction is accurated by the reliability, 43.5% variance of customer satisfaction is accurated by the tangible, and 71.5% of customer satisfaction is accurated by the overall service quality. In this empathy, assurance, reliability, responsiveness, and tangible have impact on customer satisfaction.

Based on the F-test analysis between customer satisfaction and empathy, calculated value is 132.757, between customer satisfaction and assurance is 108.468, between customer satisfaction and reliability is 197.632, between customer satisfaction and responsiveness is 95.68, between customer satisfaction and tangible is 75.541 and overall service quality and customer satisfaction is 253.357 at 5% of significant level. But the critical value of f-distribution with 5% of significant level 3.92. So our calculated value of empathy, assurance, reliability, responsiveness, Tangible and overall service quality is greater than the critical value. So, in this basis, all of the service quality factors individually have impact on customer satisfaction. And overall service quality also has impact on customer satisfaction.

Based on t-test analysis between customer satisfaction and empathy, calculated value (1 tail test) at 5% of Significant level is 11.522, customer satisfaction and assurance is 10.415, customer satisfaction and reliability is 14.058, customer satisfaction and responsiveness is 9.782,customer satisfaction and tangible is 8.691 and overall service quality and customer satisfaction is 15.917.But critical value at the significant level is (1 tail test) 1.6602. Here at calculated value of the all the factors between customer satisfactions are greater than the table value. Like this overall service quality value also greater than the table value. Therefore it is significant. So service quality has impact on customer satisfaction.

Based on all the analysis of regression, f-test, t-test analysis, service quality factors (empathy, assurance, reliability, responsiveness, and tangible) and over all service quality have impact on customer satisfaction. Which means hypothesis 1 (H1: service quality has impact on customer satisfaction) is accepted.

9. CONCLUSION

The research paper has found two major findings. They are,

1. Service quality has impact on Customer satisfaction.
2. There is positive relationship between Service quality and Customer satisfaction.

This research findings, testing of hypothesis and implication to improve customer satisfaction. Further, it is necessary to provide conclusion regarding this research. This research concluded that there is a positive relationship between independent variables (empathy, assurance, reliability, responsiveness, and tangible) and customer satisfaction.

As far as people's bank customers are concerned. They appear to be quite satisfied with their service. If we implement the recommendations made above the service could be further enhanced for the maximum satisfaction of bank could obtain competitive advantage and come to a higher position.

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APPENDIX

APPENDIX I

Correlations

		Empathy	Assurance	Reliability	Responsiveness	Tangible	Over all Service quality	Customer satisfaction
Empathy	Pearson Correlation	1	.727**	.718**	.757**	.644**	.891**	.758**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	100	100	100	100	100	100	100
Assurance	Pearson Correlation	.727**	1	.720**	.798**	.513**	.880**	.725**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	100	100	100	100	100	100	100
Reliability	Pearson Correlation	.718**	.720**	1	.746**	.570**	.872**	.818**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	100	100	100	100	100	100	100
Responsiveness	Pearson Correlation	.757**	.798**	.746**	1	.608**	.907**	.703**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	100	100	100	100	100	100	100
Tangible	Pearson Correlation	.644**	.513**	.570**	.608**	1	.762**	.660**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	100	100	100	100	100	100	100
Over all Service quality	Pearson Correlation	.891**	.880**	.872**	.907**	.762**	1	.849**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
	N	100	100	100	100	100	100	100
Customer satisfaction	Pearson Correlation	.758**	.725**	.818**	.703**	.660**	.849**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	100	100	100	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX II

REGRESSION (EMPATHY)

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Empathy [a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Customer satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.758[a]	.575	.571	10.028

a. Predictors: (Constant), Empathy

ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13351.240	1	13351.240	132.757	.000[a]
	Residual	9855.750	98	100.569		
	Total	23206.990	99			

a. Predictors: (Constant), Empathy

b. Dependent Variable: Customer satisfaction

REGRESSION (ASSURANCE)

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Assurance [a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Customer satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.725[a]	.525	.521	10.602

a. Predictors: (Constant), Assurance

ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12191.805	1	12191.805	108.468	.000[a]
	Residual	11015.185	98	112.400		
	Total	23206.990	99			

a. Predictors: (Constant), Assurance

b. Dependent Variable: Customer satisfaction

REGRESSION (RELIABILITY)

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Reliability [a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Customer satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.818[a]	.669	.665	8.860

a. Predictors: (Constant), Reliability

ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15514.040	1	15514.040	197.632	.000[a]
	Residual	7692.950	98	78.499		
	Total	23206.990	99			

a. Predictors: (Constant), Reliability

b. Dependent Variable: Customer satisfaction

REGRESSION (RESPONSIVENESS)

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Responsiveness[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Customer satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.703[a]	.494	.489	10.946

a. Predictors: (Constant), Responsiveness

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11464.481	1	11464.481	95.680	.000[a]
	Residual	11742.509	98	119.822		
	Total	23206.990	99			

a. Predictors: (Constant), Responsiveness

b. Dependent Variable: Customer satisfaction

REGRESSION (TANGIBLE)

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Tangible [a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Customer satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.660[a]	.435	.430	11.564

a. Predictors: (Constant), Tangible

ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10101.849	1	10101.849	75.541	.000[a]
	Residual	13105.141	98	133.726		
	Total	23206.990	99			

a. Predictors: (Constant), Tangible

b. Dependent Variable: Customer satisfaction

REGRESSION (OVER ALL SERVICE QUALITY)

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Over all Service quality[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Customer satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.849[a]	.721	.718	8.127

a. Predictors: (Constant), Over all Service quality

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16734.132	1	16734.132	253.357	.000[a]
	Residual	6472.858	98	66.050		
	Total	23206.990	99			

a. Predictors: (Constant), Over all Service quality

b. Dependent Variable: Customer satisfaction

STAFF DEVELOPMENT FOR AUSTRALIAN HEALTHCARE PROFESSIONALS

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ABSTRACT

Staff development in healthcare is generally accepted as being beneficial for clinical workers and service delivery in healthcare organisations. Professional development in healthcare has been positively linked to staff satisfaction, staff retention and improved patient care quality. Despite the benefits of staff development, healthcare professionals have indicated that the scope and potential for training and education could be enhanced further. With the aim of enhancing staff development in healthcare, this Australian study sought to: explore the implementation of development programs; and identify issues and areas for improvement in healthcare staff development. A total of 152 clinical staff from seven hospitals in Sydney, Australia were enrolled. The participating clinical staff comprised of medical, nursing and allied health professionals. Twenty four focus groups and eight interviews were conducted with the healthcare professionals to investigate staff development policy and practice. Staff development across hospitals was found to vary according to professional discipline group with medical, nursing and allied health workers having different opportunities and training requirements. The participants also implied development opportunities to be dependent upon staffing levels and workload. Given the largely discipline based development approach, staff development that transcends professional boundaries may be an option in promoting teamwork among multidisciplinary healthcare staff. To reduce tradeoffs between staff development and staff workload demands, effective and efficient coordination of staffing with work obligations could be beneficial in ensuring healthcare workers are able to undertake necessary development and training.

KEYWORDS
Healthcare, staff development.

INTRODUCTION

Staff development in healthcare is generally accepted as being beneficial for clinical workers and to contribute towards positive performance outcomes (Lammintakanen *et al.*, 2008; Wilcock *et al.*, 2009). Professional development in healthcare is positively linked to staff satisfaction, staff retention and quality patient care (Levett-Jones, 2005). It is suggested that staff development specialists can improve the quality of care by ensuring clinicians are taught the skills to search and evaluate evidence, and by promoting the support and reward of evidence-based practice in healthcare environments (Krugman, 2003). Healthcare staff training and development cover areas that include mandatory education (Franck and Langenkamp, 2000), communication skills (Brown *et al.*, 1999), team working (Nielsen *et al.*, 2007), quality improvement (Boonyasai *et al.*, 2007), leadership (McAlearney, 2006) and clinical skills (Hilsenroth *et al.*, 2002).

REVIEW OF LITERATURE

A variety of approaches have been utilised and encouraged to promote healthcare staff development (Bartlett, 2001; Beaubien and Baker, 2004; Waddell and Dunn, 2005; Plastow and Boyes, 2006). For nursing staff development, peer coaching which builds upon prior knowledge and skills is advocated as a viable method for ensuring the transfer of skills and behaviours learnt in training to clinical practice (Waddell and Dunn, 2005). Multidisciplinary continuing professional development group activities such as journal clubs have the advantage of improving team working across traditional professional roles and enabling better service delivery (Plastow and Boyes, 2006). Beaubien and Baker (2004) reported that while the association between simulation training and patient safety outcomes has not been clearly demonstrated, the use of simulation for training teamwork skills in healthcare has been found to improve teamwork attitudes and behaviours. A study by Bartlett (2001) involving 337 registered nurses from five hospitals found significant relationships between organizational commitment and aspects of training such as duration, access, learning motivation, support and perceived benefits.

NEED/IMPORTANCE OF THE STUDY

Despite the wide range and reported benefits of healthcare development options, healthcare staff and managers have indicated that training and education practices are under-developed (Lammintakanen *et al.*, 2008) and resources for education are often reduced or eliminated when healthcare organizations are seeking to cut costs (Lindy and Reiter, 2006). There is a need for accessible, flexible and portable development solutions in enabling clinicians to attend training (Ward and Wood, 2000). Efforts to promote healthcare staff development could consider evaluating and revising the required scope, objectives, benefits and work system considerations when implementing the range of existing education and training options.

OBJECTIVES

With the aim of enhancing staff development in healthcare, this study sought to:

1. Explore the implementation of staff development programs for healthcare professionals in an Australian context.
2. Identify issues and areas for improvement in healthcare staff development with possible implications for service delivery.

RESEARCH QUESTIONS

1. How are staff development programs implemented for healthcare professionals in an Australian context?
2. What are issues and areas for improvement in healthcare staff development that might influence service delivery?

RESEARCH METHODOLOGY

A total of 152 clinical staff from seven hospitals in Sydney, Australia were enrolled. The participating clinical staff comprised of medical, nursing and allied health professionals. Twenty four focus groups and eight interviews were conducted between March and October 2010 with the healthcare professionals to investigate staff development policy and practice. Focus groups provided the advantage of generating data from the communication between research participants responding to open ended questions from the interviewer (Kitzinger, 1995). The stimulation of interaction between research participants is a feature which distinguishes focus groups from one-to-one interviews or questionnaires (Kitzinger, 1994). While minority or sensitive views may not be voiced in a focus group (Buston *et al.*, 1998), this problem was not deemed significant for this study. The focus groups in this study were designed mainly to evaluate staff development and therefore did not directly require participants to disclose sensitive issues with regards to their team or performance. The sampling strategy of recruiting clinical workers from seven different healthcare organizations made it impractical to conduct individual interviews with all 152 staff given the time and cost

constraints faced in completing this study. Focus groups which enabled multiple participants to be grouped together for eliciting information provided a manageable and practical method. Nevertheless, eight interviews were necessary to accommodate staff unable to attend focus group sessions.

Content analysis process employed in healthcare was used in this study (Elo and Kyngäs, 2008). That is, digital recordings from focus group and interview sessions with clinical staff were transcribed for analysis. Transcripts from sessions with clinical staff were combined into documents by hospital. The combining of transcripts by hospital aided the identification of issues or unique features at a specific hospital and common elements across participants. The researcher undertook line-by-line analysis of each hospital transcript set (Bradley *et al.*, 2009). The synthesis of findings involved comparing data from research sessions at individual hospitals and contrasting data across hospitals. While every effort was made to assure participants of research confidentiality, it is acknowledged that the use of self-reported data presents the possibility of participant bias.

FINDINGS

Clinical staff responses common across hospitals suggested staff development to vary according to professional discipline group. These responses present the varying staff development requirements and opportunities by professional disciplines namely nursing, medical and allied health staff:

“Our nursing registration now dictates that we have 20 points or more for development. That is to maintain our registration. Sometimes, our nurse educator and manager give us some study leave.” (Hospital A, Clinical staff focus group iii)

“Medical registrars have a monthly training session which they are encouraged to attend. Plus additional workshops and programs that are run on weekends and we run some of those here. Nursing staff have regular in-service programs which are run on the ward. The allied health staff have at least once a week educational meetings.” (Hospital E, Clinical staff interview)

“For medical staff, all specialists are actually enrolled in the continuous professional development program and we need to fulfill a certain requirement for our ongoing registrations.” (Hospital F, Clinical staff focus group ii)

“Allied health physiotherapy in terms of professional development has about $500 per person in the budget per year.” (Hospital G, Clinical staff focus group ii)

Clinical responses from all hospitals indicated opportunities for development to depend on staffing levels and workload. The tradeoff between staffing requirements and workload with staff development in the hospitals is observable in the following responses:

“The bottom line is, you have to do a flow chart to ensure that provision of services isn’t compromised because it is compromised. How could it not be? But we all lie and say ‘No, it isn’t’ because people need to go for professional development.” (Hospital A, Clinical staff focus group i)

“I think the issue when we do attend those development programs, our patient care suffers from understaffing. But I think in the long run patients benefit from the extra skills we bring back from those courses.” (Hospital B, Clinical staff focus group ii)

“There were a lot of problems last year because of staffing. So development programs got cancelled.” (Hospital C, Clinical staff focus group iv)

Development was necessary for maintaining professional registration in clinical input from Hospitals A, B, C, D and F. Development was said to be encouraged in clinical responses from Hospitals E, F and G. However, a clinical response from Hospital C suggested that development is neither encouraged nor discouraged. Clinical input obtained from Hospital B mentioned that staff have to be self-motivated in personal development. While responses from Hospitals A, B, E and F indicated limited funding for development, clinical input from Hospital A suggested minimal and limited support for developing through educational courses. It was pointed out in clinical input that development was dependent on manager’s approval (Hospitals C, F and G). Some development benefits mentioned by clinical staff across hospitals are study leave (Hospitals A, B, C, F and G), development allowance (Hospitals C and G) and sponsorship (Hospital D). The results indicate some variation in staff development feedback among the hospitals. However, the differentiating staff input obtained shows overlap with the commonly shared feedback, therefore suggesting development policy and practice to be fairly consistent across participating hospitals.

CONCLUSIONS

Development varying by professional group would be a reflection of the different roles played by the medical, nursing and allied health staff. Each professional group fulfilling a distinct clinical care function would naturally necessitate discipline specific development. While development is largely discipline based, there may be a need to ensure clinicians receive multidisciplinary team based development in keeping with service delivery requirements of healthcare organisations. The common finding of development opportunities being dependent upon staffing levels and workload, nevertheless shows how organisational level staffing and service level workload coordination can influence prospects for staff development in the healthcare context.

To enable more participation and derive optimum benefits from healthcare staff development initiatives and programs, it may be necessary for managers to efficiently and effectively coordinate staffing levels. Timely recruitment efforts together with the filling of staff vacancies might ensure existing clinical staff are not overly burdened to the extent of having to make tradeoffs between work obligations and training programs. A well-staffed healthcare organisation could therefore be a mitigating factor for medical, nursing and allied health professionals to undertake team focused development opportunities. Further research could examine staff development in relation to other managerial functions influencing healthcare delivery. Given the multidisciplinary nature of healthcare, studying the association between staff development with teamwork may also contribute in promoting healthcare service improvements and quality outcomes.

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HYBRID SCHEDULING ALGORITHM FOR WIMAX- PBDRR

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ABSTRACT

Worldwide Interoperability for Microwave Access (Wi-MAX) networks were expected to be the main Broadband Wireless Access(BWA) technology that provided several services such as data, voice, and video services including different classes of Quality of Services (QoS), which in turn were defined by IEEE 802.16 standard. Scheduling in WiMAX became one of the most challenging issues, since it was responsible for distributing available resources of the network among all users; this leaded to the demand of constructing and designing high efficient scheduling algorithms in order to improve the network utilization, to increase the network throughput, and to minimize the end-to-end delay. In this study, we present a simulation study to measure the performance of several scheduling algorithms in WiMAX, which were Strict Priority algorithm, Round-Robin (RR), Weighted Round Robin (WRR), Weighted Fair Queuing (WFQ) Algorithm.

JEL CODE
C63

KEWORDS
IEEE802.16, Packet, QoS, Scheduling, WiMAX.

1- INTRODUCTION

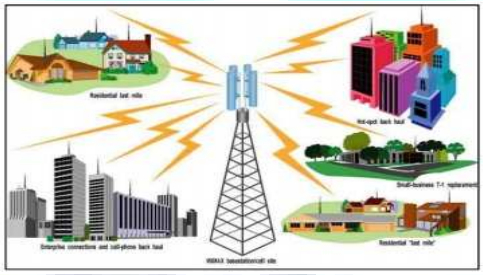
WiMAX (Worldwide Interoperability for Microwave Access), is a cell-based technology aimed at providing last-mile wireless broadband access at a cheaper cost [1]. The "last mile" is the final leg of delivering connectivity from the service provider to the customer. This leg is typically seen as an expensive undertaking because of the considerable costs of wires and cables. The core of WiMAX technology is specified by the IEEE 802.16 standard that provides specifications for the Medium Access Control (MAC) and Physical (PHY) layers. The term WiMAX was created by the WiMAX forum that promotes conformance and interoperability of the standard. Wireless Broadband (WiBRO) is a technology developed by the Korean telecommunications industry that mirrors the specifications of the IEEE 802.16 standard. Efforts are already underway to define interoperability of WiMAX and WiBRO equipment. Broadband wireless networks (including WiMAX) can be categorized into a single hop, a single-hop network contains a central entity such as a Base Station (BS) that makes and delivers decisions to all the nodes such as Subscriber Stations (SSs) in its cell. A cell is a basic geographic unit of a cellular system.

2- REVIEW OF LITURATURE

2.1- WIMAX ARCHITECTURE

WiMAX based on the standard IEEE 802.16, which consist of one Base Station (BS) and one or more Subscriber Stations (SSs), as shown in Figure 1, the BS is responsible for data transmission from SSs through two operational modes: Mesh and Point-to-multipoint (PMP), this transmission can be done through two independent channels: the Downlink Channel (from BS to SS) which is used only by the BS, and the Uplink Channel (from SS to BS) which is shared between all SSs, in Mesh mode, SS can communicate by either the BS or other SSs, in this mechanism the traffic can be routed not only by the BS but also by other SSs in the network, this means that the uplink and downlink channels are defined as traffic in both directions; to and from the BS. In the PMP mode, SSs can only communicate through the BS, which makes the provider capable of monitor the network environment to guarantee the Quality of Service QoS to the customer sired at intermediate SSs that will relay information to other SSs that are not in direct contact with the BS.

FIG 2.1 -WI-MAX NETWORK



3- IMPORTANCE OF STUDY

3.1- IEEE 802.16 QoS SERVICE CLASSES

The IEEE 802.16-2004 standard [1] specifies the provision of four scheduling services:

- **Unsolicited Grant Service (UGS):** This scheduling service is designed to support applications that generate fixed-size data packets periodically such as T1/E1 and VoIP without silence suppression.
- **Real-time Polling Service (rtPS): This** scheduling service is designed to support real time applications that generate variable size packets on a periodic basis such as MPEG video or VoIP with silence suppression.
- **Non real-time Polling Service (nrtPS):** nrtPS is designed to support non-real time applications that require variable size data grant bursts on a regular basis. This scheduling service supports applications that are delay tolerant but may need high throughput such as File Transfer Protocol (FTP) applications [5].
- **Best Effort (BE**): This traffic class contains applications such as telnet or World Wide Web (WWW) access that do not require any QoS guarantee.

4- OBJECTIVE

SCHEDULING ALGORITHMS

Scheduling algorithms are responsible for Distributing resources among all users in the network, and provide them with a higher QoS. Users request different classes of service that may have different requirements (such as bandwidth and delay), so the main goal of any scheduling algorithm is to maximize the network utilization and achieve fairness among all users.

4.1- STRICT PRIORITY (SP)

Strict-Priority packets are first classified by the scheduler according to the QoS class and then placed into different priority queues. It services the highest priority queue until it is empty, and then moves to the next highest priority queue. This mechanism could cause bandwidth starvation for the low priority QoS classes [8].

4.2- ROUND ROBIN (RR)

It serves each priority queue, starting with the highest priority queue that contains packets, services a single packet, and moves to the next lower priority queue that contains packets, servicing a single packet from each, until each queue with packets has been serviced once. It then starts the cycle over with the highest priority queue containing packets [10].

4.3- WEIGHTED ROUND ROBIN (WRR)

Packets are first classified into various service classes and then assigned a queue that can be assigned a different percentage of bandwidth and is serviced in round robin order. WRR ensures that all service classes have access to at least some configured amount of network band width to avoid bandwidth starvation. In order to provide the correct percentage of bandwidth to each class if only all of the packets in tall queues are the same size or when the mean packet size is known in advance [5].

4.4- WEIGHTED FAIR QUEING (WFQ)

WFQ is a data packet scheduling technique which is used for various size packets. It allows different scheduling priorities to statistically multiplexed data flows and provides the priority to traffic that automatically sorts among individual traffic streams without the requirement of an access list. If N data flows currently are active, with weights w1, w2...wN, data flow number i then average data rate can be achieved as shown in equation [1].

$$\frac{Rw_i}{(w_1 + w_2 + \ldots\ldots\ldots\ldots\ldots\ldots + w_N)} \quad (1)$$

By regulating the WFQ weights dynamically, it can be utilized for controlling the quality of service, for example to achieve guaranteed data rate. WFQ gives each flow different weight to have different bandwidth percentage in a way that preventing monopolization of the bandwidth by some flows providing fair scheduling for the different flows [5].

5. SIMULATION AND RESULT

The proposed SS-assisted scheduling algorithm was simulated under the Network Simulator NS-3.17 [19] using first a network topology consisting of 02 SS nodes interconnected through a single BS node. Then, the number of SSs was varied to test the scalability of the proposed approach.

The following parameters are used in scenario:

- Bottleneck-link-delay – 1 ms
- Bottleneck Bandwidth – 10 Mbps
- Transport protocol type – UDP/TCP
- routing protocol – DSDV
- Packet size of UDP/TCP – 1500 bytes
- Scheduler – PBDRR
- Simulation Duration - 100 sec
- Modulation – OFDM 64 QAM
- Coverage area of base station – 500 m radius
- Other parameters used in queue scheduling schemes are set to the default values

FIG 5.1: SHOWS SIMULATION OF 3 NODES

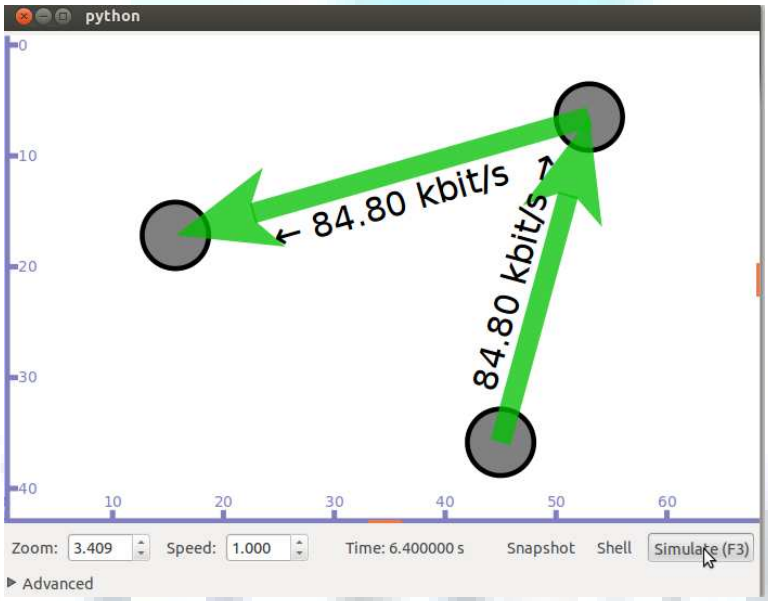


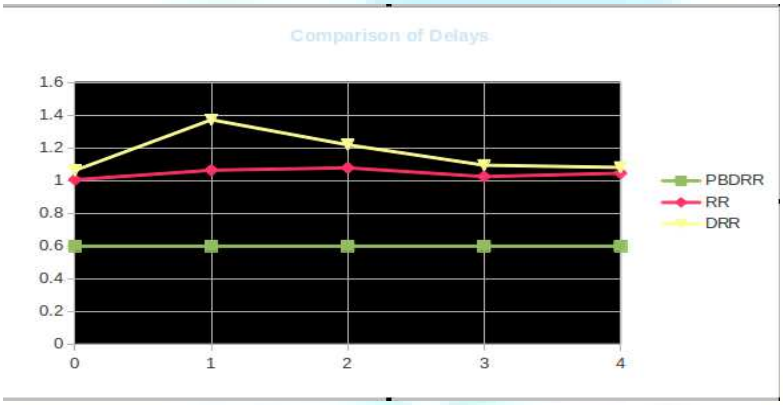
FIG 5.2: SHOWS RESULTS USING NS3

```
umesh@umesh-HP-630: ~/ns/ns-allinone-3.17/ns-3.17
TraceDelay: RX 378 bytes from 12.1.1.2 Sequence Number: 4 Uid: 11959 TXtime: +60
40000000.0ns RXtime: +6099702981.0ns Delay: +59702981.0ns
TraceDelay: RX 1012 bytes from 12.1.1.2 Sequence Number: 1 Uid: 11956 TXtime: +6
040000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 506 bytes from 12.1.1.2 Sequence Number: 2 Uid: 11957 TXtime: +60
40000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 122 bytes from 12.1.1.2 Sequence Number: 3 Uid: 11958 TXtime: +60
40000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 378 bytes from 12.1.1.2 Sequence Number: 4 Uid: 11959 TXtime: +60
40000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 1012 bytes from 12.1.1.2 Sequence Number: 1 Uid: 11956 TXtime: +6
040000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
TraceDelay: RX 506 bytes from 12.1.1.2 Sequence Number: 2 Uid: 11957 TXtime: +60
40000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
TraceDelay: RX 122 bytes from 12.1.1.2 Sequence Number: 3 Uid: 11958 TXtime: +60
40000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
TraceDelay: RX 378 bytes from 12.1.1.2 Sequence Number: 4 Uid: 11959 TXtime: +60
40000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
Sent 765 bytes to 224.30.10.81
Sent 407 bytes to 224.30.10.81
Sent 504 bytes to 224.30.10.81
TraceDelay: RX 753 bytes from 12.1.1.2 Sequence Number: 5 Uid: 12376 TXtime: +62
40000000.0ns RXtime: +6250336263.0ns Delay: +10336263.0ns
TraceDelay: RX 395 bytes from 12.1.1.2 Sequence Number: 6 Uid: 12377 TXtime: +62
```

TABLE 5.1: TABLE SHOWING COMPARISON BETWEEN DELAYS OF DIFFERENT SCHEDULING ALGORITHMS

S.No	PBDRR	RR	DRR
0	0.59762913	1.00421941	1.06123449
1	0.59762981	1.0625	1.371425571
2	0.59762075	1.07692308	1.217944718
3	0.59763075	1.02348993	1.093023256
4	0.5976312	1.04411765	1.079545455

FIG 5.3: ANALYSIS OF DELAY OF DIFFERENT SCHEDULING ALGORITHMS



6. CONCLUSIONS

In this proposed method PBDRR algorithm is implemented using ns3. We analysis delay at various packet size. As results shows delay between frames in minimum for PBDRR scheduling algorithm. In future work develop algorithm for mobile Wi-Max.

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Thanking you profoundly

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