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   OBJECTIVES

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   RESEARCH METHODOLOGY

   RESULTS & DISCUSSION

   FINDINGS

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EFFECT OF SPIRITUAL TOURISM ON FINANCIAL HEALTH OF THE UTTARAKHAND STATE OF INDIA

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ABSTRACT

India has been maintaining its identity as a hub of spirituality in spite of inevitable changes in the society owing to phenomenal advancements in science and technology globally. Tourists' interest in India is attributed to the curiosity factor attached to the varied culture of India. Every year, tourists from all over the globe visit India for vacation as well as for spiritual purposes. The main focus of the study was to explore economic and socio-cultural impacts of tourism on the economic health of an Indian state known for its spiritual shrines at several picturesque and geographically challenging locations. The objective of the current paper was to analyse the impact of spiritual tourism on the economy of Uttarakhand state of India. The study was based on secondary data obtained from various sources. Analyses were carried out in the context of several attributes of spiritual tourism pertaining to the state. A causal-loop model showing the interrelationship of major factors was constructed. The study outlined few steps regarding the prospects of spiritual tourism in the state. It was concluded that there exists immense potential for the state to explore spiritual tourism towards strengthening its economy and socio-cultural enrichments.

KEYWORDS
causal-loop representation, economic impact, employment, infrastructure, Spiritual tourism, Uttarakhand economy.

INTRODUCTION
Tourism has been recognized as one of the major revenue earning industries worldwide. It is considered as a smokeless industry which has been continuously growing and flourishing. It is important to note that the concept and scope of tourism have been progressively changing. In an earlier work, Hunziker and Krapf, in the year 1941, defined tourism as "the sum of the phenomena and relationships arising from the travel and stay of non-residents, in so far as they do not lead to permanent residence and are not connected with any earning activity" (Leiper, 1979). International Association of Scientific Experts in Tourism later, broadened the concept of tourism and defined tourism in terms of particular activities selected by choice and undertaken outside the home environment (Wheeler, 1995). Today, tourism has attained the status of even the highest revenue earner industry for many countries. This service sector industry has become a real threat for the core manufacturing sector industries in the recent times. Consequently, research interest in the area has also been increasing considerably.

Tourism is considered as one of the largest economic activity in the world, and perhaps the largest in the services sector. It is also one of the fastest growing sectors of the world economy. Tourism is vital for many countries, due to the income generated by the consumption of goods and services by tourists, the taxes levied on businesses in the tourism industry, and the opportunity for employment in the service industries associated with tourism. Tourism has its own direct and indirect effect on society which is regarded as an effective instrument of country's economic development. Government of India also adopted different approaches for promotion of tourism, which include new mechanism for expediting implementation of tourism projects, development of integrated tourism circuits and rural destinations, special capacity building in the unorganized hospitality sector and new marketing strategies to promote India as a brand.

Uttarakhand, the 27th state of India, also known as the abode of Gods, is one of such states of India which offers variety of experiences to the tourists. It is primarily a hilly state with only about ten percent of its total geographical area in the plains. According to a report of Uttarakhand Tourism Board, 2008, Uttarakhand economy mainly relies on tourism industry. Uttarakhand, being situated on the foothills of Himalayas, comprises of numerous hill stations which attract tourists from all across the globe thereby bringing money to the state. Apart from the hill stations, the wildlife has also been a major attraction for tourism as tourists come to visit the wildlife sanctuaries such as Corbett National Park and the famous Tiger Reserve. The other major aspect of tourism in the state is the spiritual tourism. The state is considered to be the home of number of spiritual centers. Thus, the state witnesses a major share of tourists visiting different places for spiritual activities. The Uttarakhand economy is all poised to take advantage of this situation and expand its tourism sector. The two inputs that are considered necessary for the development of this sector, i.e., natural and human capital, are abundantly available in the state. Thus, it has the potential to match the rise in tourism demand with an increase in supply of tourism services. This paper presents an analysis of the possible impact of tourism, and spiritual tourism in particular, on the state's economy based on the data from different sources.

OBJECTIVES OF THE STUDY AND METHODOLOGY
The following are the main objectives of the present study:
1) To analyse the impact of spiritual tourism on the economy of Uttarakhand state of India and
2) To explore economic and socio-cultural impacts of spiritual tourism in this state.
The methodology used in this study is of descriptive type that has been adopted for different economic estimations based on the data of various surveys conducted by different agencies, government organizations and Ministry of Tourism, Government of India. Attempts have been made to analyse possible impacts of tourism, in general, and spiritual tourism, in particular, on the Uttarakhand state's economy based on the available secondary data.

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IMPACT OF TOURISM IN INDIA

The tourism industry is one of the key players in the nation's changing face because of its unparalleled growth prospects and unlimited business potential. Furthermore, appropriate upgrading of the country's tourist information services, initiatives like massive investment in infrastructure of hotels, other infrastructure developments like airports, national highways, etc, will help tourism and hospitality sector bound to get a leap in its growth. Tourism, as a major service sector industry in world economy, has multi-dimensional impacts on the society. Glenn Kreag (2001) has identified the impacts of tourism into seven general categories. They are Economic, Social and Cultural, Environmental, Crowding and congestion, Community attitudes, Services and Taxes. Kreag further analyzed that each of these impacts has both positive and negative aspects. Some of the features that describe the impact of tourism on economy are illustrated in the Figure 1. Tourism brings capital to a state's economy, improves a state's infrastructure, and creates ample business opportunities in sectors like food, transport, and hospitality. However at the same time, it could adversely affect the state's economy by contributing to price rise, creating temporary scarcity of land, labour, and housing etc. Thus, it is necessary to adopt a scientific approach to analyse the possible impacts of tourism in the economy of a state that has significant tourism potential. Appropriate strategy to tap these potentials could yield handsomely for the state's economy.

FIGURE 1: IMPACT OF TOURISM IN UTTARAKHAND'S ECONOMY
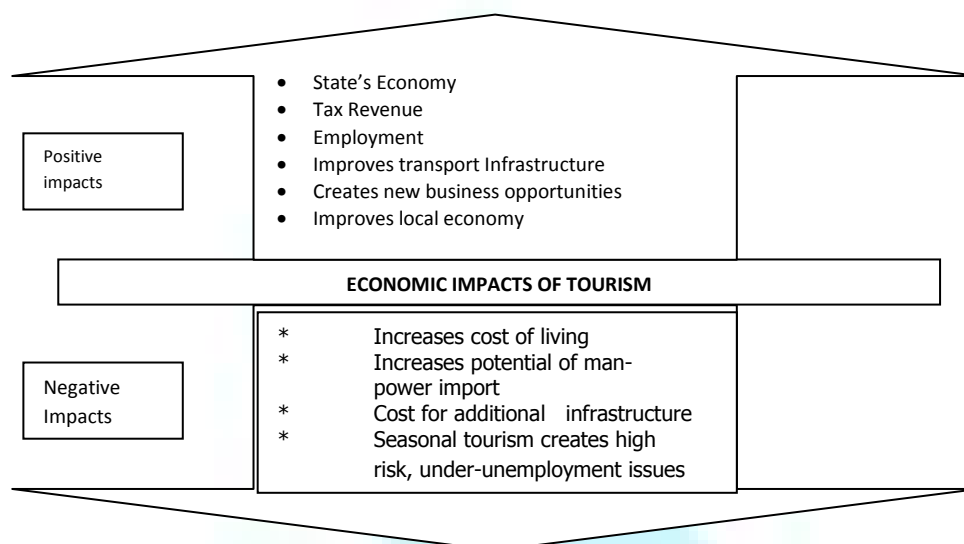
The state of Uttarakhand, a tourist's paradise, is bounded by Nepal in the east, the Tibet Autonomous Region of China in the north, Himachal Pradesh in the west and Uttar Pradesh in the south. The total geographical area of the state is about 53,483 sq. km which is 1.63 percent of India's area. The state Uttarakhand was carved out of Uttar Pradesh and given an independent status as the tenth Himalayan state and the twenty-seventh state of the Indian Union on 9th November, 2000. There are 15,638 inhabited villages and 86 urban settlements in the state. Total forest reserve area in Uttarakhand accounts for 65% of the total land area of the state, which is 4.53% of India's forest area. Further, with more than three-fourths (78 percent) of its total population dependent on agriculture for livelihood, the economy of Uttarakhand is predominantly dependent on mountain agriculture. The major financial sectors in Uttarakhand have been identified as Agriculture, Natural Resources, Industry, Real Estate and the booming sector is Tourism. The tourism sector has become one of the major industrial sectors of the Indian Economy. Uttarakhand being situated in the foothills of the Himalayas comprises of numerous hill stations/wild life sanctuaries, which attract tourists from all across the globe. The next most important contribution to the economy of Uttarakhand state is the agricultural sector with approximate 5.7 million hectares of cultivated land. Cereals, pulses, oil seeds, sugarcane and onion are the major crops grown here. As 78% of the population depends on agriculture, it also contributes considerable revenue to the state's economy. Another important components on which the economy of Uttarakhand depends is its mineral resources. The state consists of large resources of minerals such as limestone, rock phosphate, dolomite, magnesite, copper, graphite, soap stone, gypsum and many others. Many of these minerals are exported out of India that fetches good revenue. Uttarakhand economy also depends upon its small scale industries. The state has all total 28249 small scale units and 397 cottage (*gramodhyog)* units. This state also has 191 heavy industries that are earning a profit of ` 26946.6 million. Another component that is spreading its wings in Uttarakhand is the real estate. With more and more real estate agents flowing into this state, it will be one of the major forces in determining the flow of economy of Uttarakhand.

TOURISM IN UTTARAKHAND

Foreign tourism is an integral part of the Uttarakhand economy. In the last decade the tourism industry experienced strong growth, with large increases in arrivals of foreign tourists, tourist spending and investment. Apart from economic consideration, Tourism is not limited to industry alone. It has manifold impacts on the state as well as on the society. This is a state where tourists are welcome like *Devtas* (meaning the GOD). Naturally, the *atithis* (tourists) respond overwhelmingly to the state's welcome. Thus, as high as 0.5 million International Tourists are expected by the year 2020 (Government of India, 2008). This state is also known as adventure and spiritual capital of India, which are the other causes of attraction for the tourists. Although the state is a remarkably new state, its GDP rate is 9.31% which is significantly higher than the Indian's national average GDP of 8.45%.

Tourism has been playing a major role in building and sustaining the economy of Uttarakhand. Tourism has been a major driver of economic growth and livelihood promotion in most of the remote areas of Uttarakhand. The income earned from tourists by providing various services including transportation, food and beverage, pony and porter services, etc. sustain the livelihood of several villages in the remote hilly regions of Uttarakhand.

An interesting fact about tourism in Uttarakhand is that the number of tourists to the state, both inbound and outbound, has been increasing. However, the rate of growth is marginal. A comparative profile of tourists visiting India and Uttarakhand in the first six years of the present decade has been presented in Table 1. Further, only a very small percentage (~3 – 4 %) of the total tourists coming to India is visiting the state. According to a report of the Uttarakhand Tourism Development Master Plan 2007–2022 (Government of India, 2008), in the case of foreign tourist visit, the share of Uttarakhand has been declining over the years since 2002 except for a marginal increase in the year 2005. The annual growth rate of domestic tourist visits in Uttarakhand during the period 2001 – 2006 was 12.9% as against 14% growth at the national level. Further, the international tourist growth rate achieved by Uttarakhand was 12.0% as against 16.0% growth at the national level. The facts call for adopting appropriate strategies to attract to tourists to the state.

In the current decade there has been a continuous growth in the flow of both domestic and international tourist to the state which is a very healthy sign for the state's economy. Analyses of data from different sources show that the trend is not very encouraging for the Uttarakhand state tourism. Although the percentage of tourists visiting the state is remaining more or less same but the fact is that only 3 – 4% of the total tourists coming to India are visiting Uttarakhand as shown in Table 1. Maybe, this kind of study will make the concerned authorities more proactive about how this percentage can be improved which will have a significant impact on the socio-economic and socio-cultural activities of the state.

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According to the data available from the Ministry of tourism, Government of India for the year 2010, it was found out that FTAs (Foreign Tourist Arrivals) in India during 2010 were 5.58 million with a growth rate of 9.3% as compared to the FTAs of 5.11 million and growth rate of (-)3.3% during 2009. The number of domestic tourist visits increased from 650.00 million in 2009 as compared to 562.98 million in 2008 showing a growth of 15.5%. The FEE (Foreign Exchange Earnings) from tourism during 2010 was US $ 14193 million as compared to US $ 11394 million during 2009 and US $ 11747 million during 2008 (Ministry of Tourism, 2011). Uttarakhand featured in the eighth position in the top ten states in India in terms of number of domestic tourist visits (in millions) during 2009, a list topped by the state Andhra Pradesh, which incidentally hosts a number of famous spiritual places. The Table 2 shows the rank of Uttarakhand state in terms of number of domestic and foreign tourists respectively in the year 2009, according to a survey conducted by the Ministry of Tourism, Government of India. The Table 2 indicates that the domestic tourists have better interests toward this state. The state, on the other hand, closely follows the national annual growth rate, it is clearly revealed.

TABLE 1: TOURIST PROFILE IN UTTARAKHAND DURING 2001 – 2006

Year	Number of tourists (in millions)		
	Domestic	**International**	**Total**
2001	9.55	0.04	9.60
2002	10.61	0.05	10.65
2003	10.84	0.06	10.89
2004	11.72	0.06	11.78
2005	14.22	0.08	14.29
2006	19.36	0.10	19.45

Source: Mittal et al. 2008

TABLE 2: DOMESTIC (D) AND FOREIGN (F) TOURISTS IN UTTARAKHAND STATE DURING 2007-2009

2007 (million)		2008 (million)		2009 (million)		Annual Growth Rate 2008/2007		Annual Growth Rate 2009/2008		% share in 2009		Rank in 2009	
D	F	D	F	D	F	D	F	D	F	D	F	D	F
19.803	0.096	20.546	0.1	21.935	0.106	0.38	0.41	0.68	0.66	0.34	0.8	8	15

Source: Tourism Statistics at a glance (2009)

FOREIGN EXCHANGE EARNINGS OF UTTARAKHAND

India's foreign exchange earnings for the last three years are shown in the Table 3. The growth rate in FEE has shown a decline, which, in rupee terms during the year 2009 was 8.3% as compared to 2008, and 14.4% during 2008 as compared to 2007. In spite of the negative growth rate of 3.3% in FTAs due to economic recession and other adverse factors for tourism, FEE in rupee terms observed a significant growth of about 8% during the year 2009.

Thus with tourism as an earning source, the state's treasury is also getting inflated handsomely. If one considers the average individual expenditure of a tourist as suggested in the Uttarakhand Tourism Development Master Plan 2007–2022 (Govt of India, 2008), domestic tourists spends approximately one thousand rupees per night while international tourists spends approximately double the amount. Again, if we consider an average of four days stay of an international tourist in the state, the state earns an foreign exchange of approximately one thousand million rupees, and the corresponding tax revenue fetched by the tourism is ` 141.4 million as illustrated in the Figure 2.

TABLE 3: FOREIGN EXCHANGE EARNINGS

Month	Foreign Exchange Earnings		(million)	Percentage Change	
Jan-Dec	2007	2008#	2009#	2008/2007	2009/2008
Total	443600	507300	549600	14.4%	8.3%

Source: Tourism Statistics at a glance (2009)

FIGURE 2: FOREIGN EXCHANGE EARNING OF THE STATE
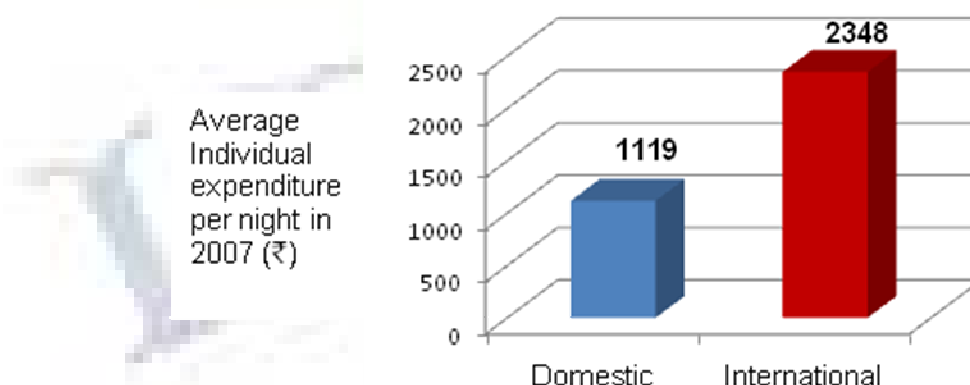
Source: Government of India, 2008

ECONOMIC IMPACT OF SPIRITUAL TOURISM IN UTTARAKHAND

Interesting information available with Uttarakhand Tourism Development Board (UTDB) is that about 58.2% of the international tourists visits were for holiday/ sightseeing, 21.9% for health/yoga, and about 19.4% for pilgrimage/ religious functions as shown in Figure 3. For domestic tourists, on the other hand, the main purpose of 44.2% of the tourist visit was pilgrimage/religious while that of 43.6% was holiday / sightseeing. Spiritual beliefs of common Indian people contribute to this observed higher ratio of domestic spiritual tourists. However, if the number of spiritual tourist can be enhanced through various motivational/promotional programmes, the revenue earned by the state can be significant.

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The forecast presented in the Uttarakhand Tourism Development Master Plan 2007–2022 (Government of India, 2008) can be graphically illustrated in the Figures 4–5. The domestic tourist visits in Uttarakhand by 2012, 2017 and 2022 are projected to be 42.24 million, 77.82 million and 143.38 million, respectively, while the projected foreign tourist visits are estimated at 0.227 million, 0.399 million and 0.703 million respectively. Thus, in case of these targets get realized, the corresponding income generation at 2004-05 prices are likely to be as presented in Figure 5. The projected income has been arrived at by considering individual spending of international and domestic tourists at ` 2348.00 and ` 1119.00 per day for a stay of four and two days, respectively.

FIGURE 3: SEGMENTATION OF TOURISTS ACCORDING TO THE MOTIVATION OF VISIT
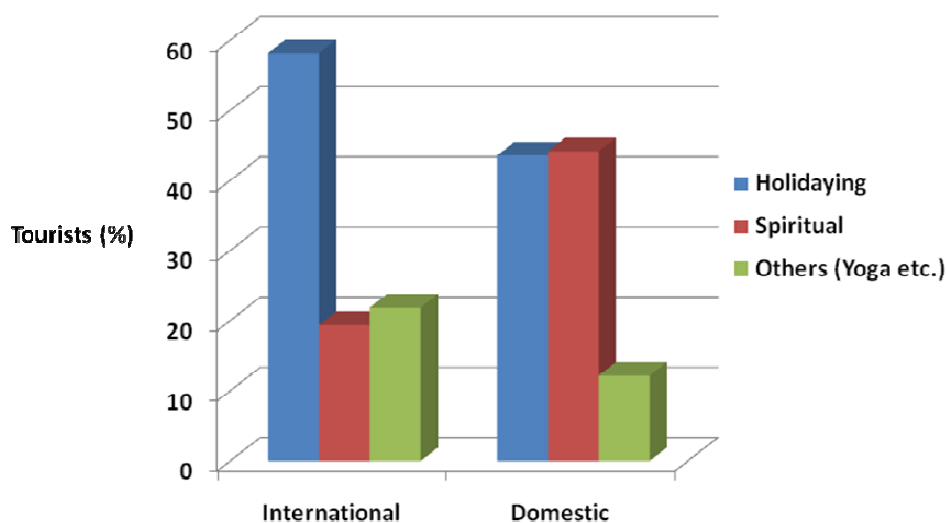
Source: Government of India, 2008

FIGURE 4: SHARE OF SPIRITUAL TOURISTS IN UTTARAKHAND IN THE YEAR 2007
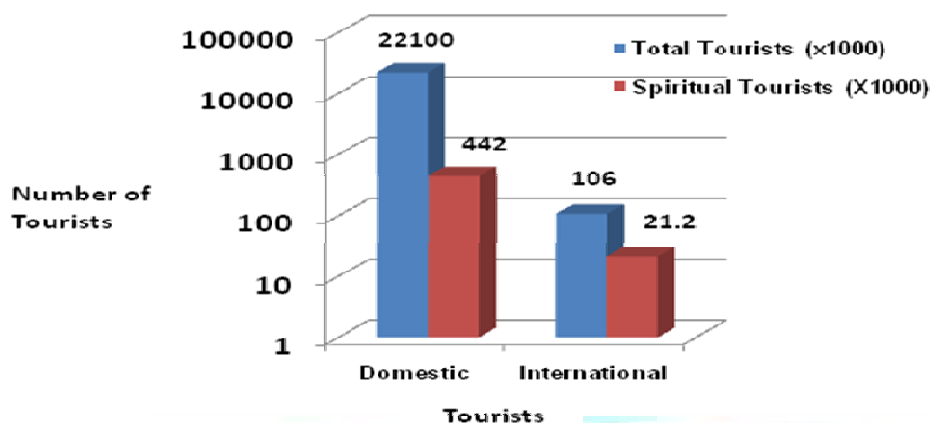
Source: Government of India, 2008

FIGURE 5: STATE'S EARNINGS FROM SPIRITUAL TOURISTS IN THE YEAR 2007

Source: Government of India, 2008

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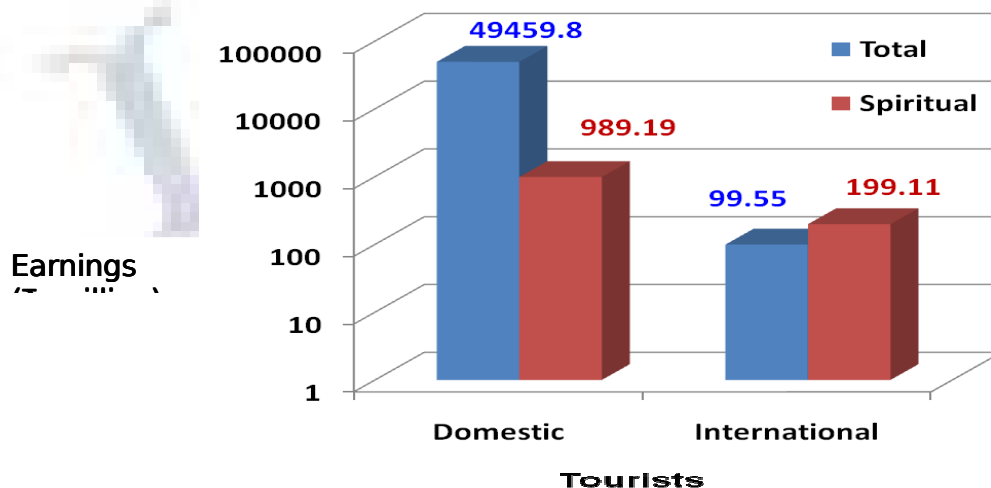
DIRECT AND INDIRECT EMPLOYMENT THROUGH TOURISM

One of the major benefits of growth of tourism is the generation of direct and indirect employment. Employment generation in a state, which has very little to boast about regarding the growth of small and heavy industries, has certainly a decisive impact on its economy. The type of employment generated owing to the spiritual tourism can broadly be categorized into organised and unorganised sectors depending on their mode of functioning. The categorization is schematically presented in the Figure 6. The state has a number of state supported tourism agencies apart from a separate Government Department for formulation and implementation of policies. Hospitality in all the important spiritual places is also provided by many hotels and guest houses run by Government, Non Government Organisations (NGOs) and private entrepreneurs. Many big chain hotels have their existence in the spiritually strategic locations. All such establishments basically employ the local people contributing towards minimizing the state's unemployment problem. Number of tourist operators chain-linking the various spiritual places as well as providing a large pool of man power is working in an unorganised manner in almost all the spiritual places of the state. These include – local conveyances providers through autorickshaw, rickshaw, horses, donkeys, persons engaged in various spiritual activities, persons who run very small tea/refreshment shops (*Chaiwallas*), vendors who sells various materials for spiritual activities, tourist guides and in other indirect services like laundries, hair styling etc. Thus, there are number of employment opportunities growing in and around the spiritual activity centers whose earnings solely depend on the spiritual tourists.

FIGURE 6: DIRECT AND INDIRECT EMPLOYMENT THROUGH SPIRITUAL TOURISM
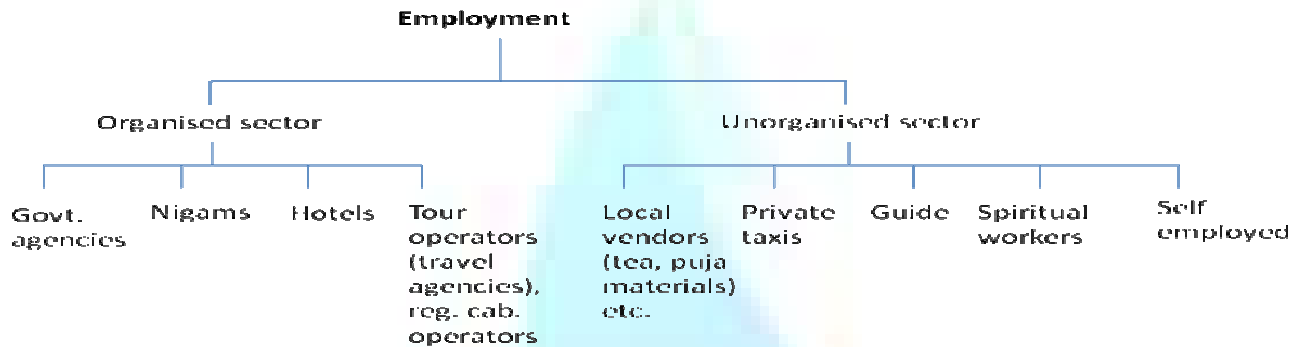
TOURIST-ECONOMY-INFRASTRUCTURE MODEL

The importance of tourism for an economy is independent of its status of development. Tourism played a major role in shaping the economies of many advanced countries including the United States of America and Spain. Tourism generated five million jobs in the USA in the year 1989. It is not only state's income that makes tourism sectors important. The sectors like foreign investment, subsidies, employment and taxation also get highly affected. Infrastructure and resources are considered the most important features for any country. In developing and advanced countries, tourism is viewed as an important means to enhance income and employment. There have been considerable researches on tourism and relationships with economic development.

A generalized causal-loop relationship of the features like number of tourists, state's economy, infrastructure and employment has been illustrated in the Figure 7. The number of spiritual tourists in the state increases with an increase in total number of tourists in the state through whom the state earns revenue. On the other hand, as the state's economy flourishes, the state would be tempted to improve upon the sources of their revenue earning spiritual places. Better economy would also provide the state with the opportunity to develop its infrastructure. Improved condition of the spiritual centers and the state-of-the-art infrastructure naturally attract more tourists to the state making it a positive loop. As a consequence of the increase in the number of tourists to a state, a higher degree demand in the services sector is automatically generated. This includes hospitality, communication, health care, and specialized services in the spiritual centers. The type of specialized services shall vary according to the nature/characteristics of the center including need for local guides, spiritual activist, barbers, local conveyances etc. A rising demand in small services segments, on the other hand, creates employment opportunities basically for the local residents, which in turn, contributes positively to the state's economy.

FIGURE 7: A CAUSAL-LOOP PRESENTATION OF THE TOURIST-ECONOMY-INFRASTRUCTURE

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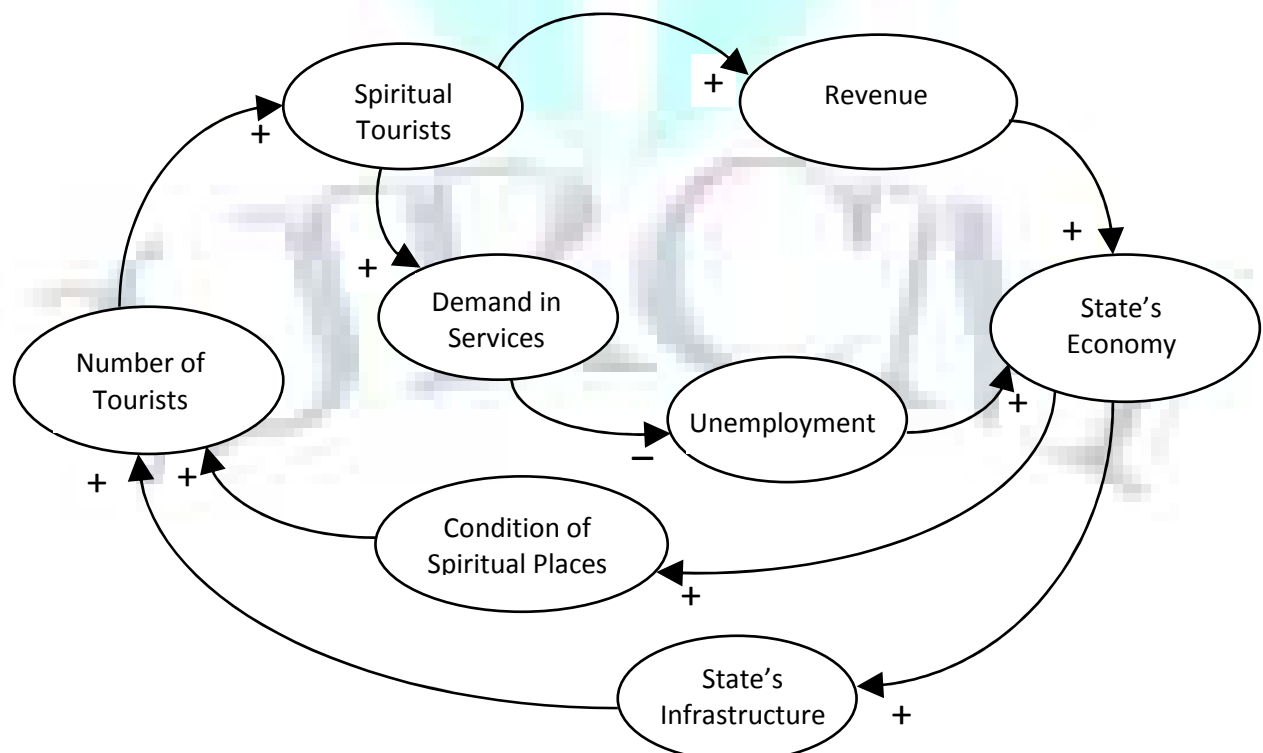
FUTURE PROSPECTS OF SPIRITUAL TOURISM IN UTTARAKHAND

As mentioned already, Uttarakhand, one of the hilly states of India that takes the pride having the 'Queen of Hills', is also considered as the 'base of spiritual places'. Thus, ideally there should not be a reduction in the size of tourists visiting the state given the improving infrastructure of the state. The future prospects of spiritual tourism in the state have also been partially studied. The forecast presented in the Uttarakhand Tourism Development Master Plan 2007–2022 (Government of India, 2008) can be graphically illustrated in the Figures 8–9. The domestic tourist visits in Uttarakhand in the years 2012, 2017 and 2022 are estimated to be 42.24 million, 77.82 million and 143.38 million respectively. The foreign tourist visits, on the other hand, are projected at 0.227 million, 0.399 million and 0.703 million respectively by the same years. Consequently, the states revenue should grow healthy. However, the increase in number will largely depend on the attitude the state would exhibit towards welcoming the tourists by improving the infrastructure.

Optimizing the possible benefits of tourism and tourism related activities is critical to Uttarakhand's economy, and hence the state's development. The enhancement of economic benefits of tourism, particularly income generation and employment creation depends on strengthening of infrastructure facilities, effective marketing, adequate human resource development and strengthening of institutional structure for the promotion of tourism in the State. A number of specific recommendations in respect of these aspects are reported in various reports (Mittal et al., 2008; Government of India, 2008). A summary of these recommendations may be presented as follows:

- Branding of Uttarakhand as a tourist destination and image creation.
- Branding Uttarakhand as a destination for spiritual tourists, as well as for leisure and recreation, adventure, trekking, etc.
- Adopting appropriate marketing strategy to attract both national and international tourists.
- Issues like infrastructure development pertain to transportation, electricity and drinking water supply, telecommunications, emergency services, restaurants and hotels, and waste disposal are to be addressed realistically.
- Periodical surveys of both domestic and foreign tourists may be undertaken for assessing the profiles, motivational factors, expenditure patterns and satisfaction levels.
- The Tourist Information Centers at the district headquarters should create and maintain a data base of accommodation, travel agencies, tour operators, guides, etc. operating in the respective districts and update the same regularly by using the computer facilities already available.
- Human resource development including promoting community tourism initiative so that tourists can have a real experience of villages.
- The establishment of effective linkages of tourism activities with other sectors like art and crafts, entertainment industry, trade, etc.
- Establishment of some decent souvenir shops and shopping arcades in different parts of the state which could attract the tourists to make purchases.

FIGURE 8: ESTIMATED TOURISTS TO VISIT THE STATE UTTARAKHAND
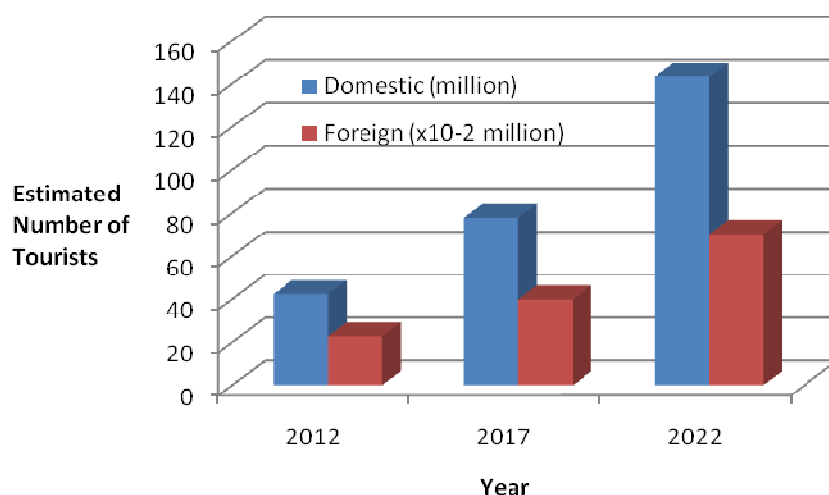
Source: Government of India, 2008

FIGURE 9: PROJECTED GROWTH IN UTTARAKHAND

Source: Government of India, 2008

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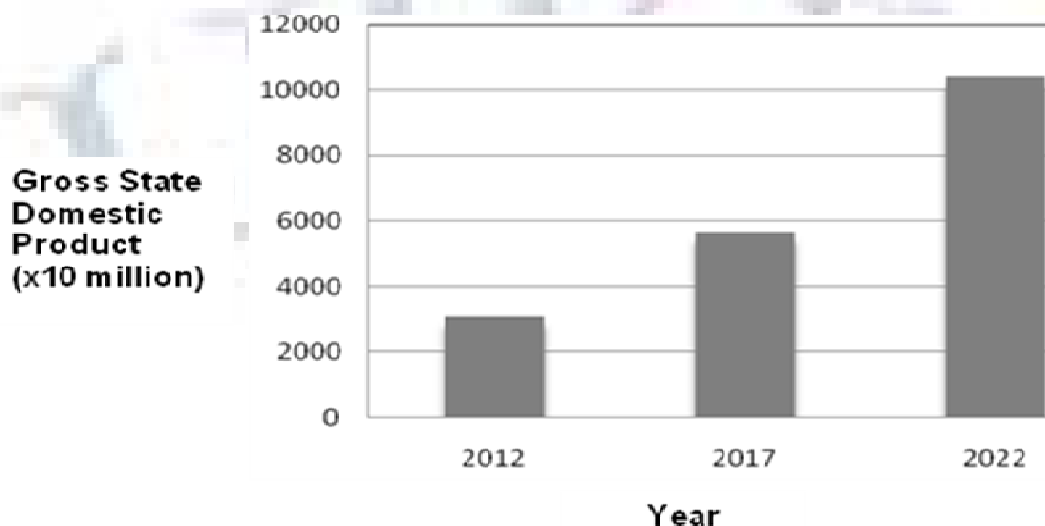
CONCLUSION

The status of tourism and, spiritual tourism, in particular, in the Indian state of Uttarakhand have been analysed in the present paper with the help of data from various sources. The possibility of the revenue to be earned by the state from spiritual tourists has been explored. A causal-loop representation of the effect of spiritual tourists on the state's economy has been developed. The following conclusions can be made from the present study:

1. Tourism is one the highest revenue earning industries in Uttarakhand.
2. Most tourists are primarily attracted either by its natural beauty (holidaying) or by its centers of spiritual activities.
3. There has been an increase in the rate of tourist inflow to the state, particularly in the current decade.
4. Spiritual tourism plays an important role in determining state's economic health.
5. Earning through tourists and employment (both direct and indirect) are two important indicators which influence the state's economy significantly.
6. International spiritual tourists contribute more towards the state's revenue than the domestic tourists.
7. The percentage of domestic spiritual tourists is more than the international tourists.
8. In order to enhance the inflow of spiritual tourists to the state, the conditions of the spiritual places, and the state's infrastructure should be improved.

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A FUZZY EOQ INVENTORY MODEL WITH LEARNING EFFECTS INCORPORATING RAMP –TYPE DEMAND, PARTIAL BACKLOGGING AND INFLATION UNDER TRADE CREDIT FINANCING

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ABSTRACT

An EOQ Inventory model for a deteriorating item with ramp – type demand is developed in fuzzy stochastic environment with random Weibull distribution under inflation and time value of money over a finite planning horizon, when delay in payment is allowed to the retailer to settle the accounts against the purchases made by him. Here, we have considered two cases: (1) payment within the permissible time and (2) payment after the permissible time. Shortages are allowed. Here, we propose a mathematical model and theorem to find minimum total relevant inventory cost and optimal order quantity. Firstly, we consider the demand and net inflation rate to be crisp in nature. The holding, purchasing, shortage, lost, selling, and ordering costs are represented by triangular fuzzy numbers which are then transformed to corresponding weighted interval numbers by using nearest interval approximation. Following interval mathematics, the single objective fuzzy problem is reduced to a crisp multi – objective decision making (MODM) problems. The MODM problem is again transformed to a crisp single objective problem with the help of weighted sum method. The demand rate and the net inflation rate are taken as trapezoidal fuzzy numbers to make the problem much more realistic and derive the expressions for the total inventory cost applying Function Principle and then defuzzified using graded mean integration representation method. Numerical examples are cited to illustrate the developed mode. Some sensitivity analysis is carried out. We have applied the learning effects to further improve the optimal order quantity.

KEYWORDS

Trade Credit Financing, random Weibull distribution, fuzzy ramp-type demand, function principle, learning effects.

INTRODUCTION

In the inventory model, deterioration takes a substantial role for analysis of required results. It can be found in the form of decay, change, damage, spoilage or obsolescence that results in decreasing usefulness from its original purpose. Some kinds of production like food items (vegetables, fruits, milk, etc.), drugs, pharmaceuticals and radioactive substances are few examples in which appreciable deterioration can take place during the normal storage period of the units and consequently this loss must be taken into account when analyzing the model. Hence, many authors have considered Economic Order Quantity (EOQ) inventory models for deteriorating items with exponential decay proportional to the on-hand inventory. Hwang [1997] proposed a model in which inventory deteriorates with time. Deng [2005], Tripathy et. al. [2010], Chang et. al. [2010] considered the market demand of the item to be constant or time-dependent in their works. But in the real market demand of the product is always in dynamic state due to variability of time, price and stock displayed in inventory level. This impressed researchers and marketing practitioners to think about ramp type demand which increases with time upto a certain limit and then ultimately stabilizes and becomes constant. Such type of demand is observed in the items as newly launched mobile phones, fashion goods, garments, cosmetics etc.

Mondal et. al. [1998] presented an order level inventory model for deteriorating items with ramp type demand. Wu and Ouyang [2000] extended their model by the concept of shortages. Giri et al. [2003] and Wu et al. [1999] developed an EOQ model with Weibull deterioration, shortages and ramp type demand. Peter Shaohua Dang [2005] further generalized the Wu et al.[1999] and Jain and Kumar [2007] further generalized Wu and Ouyang [2000] model by allowing Weibull deterioration along with some proposed theorems to find the time at which on-hand inventory reaches to zero. Panda et al. [2008] gave an optimal replenishment policy for perishable seasonal product with ramp type demand rate. Sharma et al. [2009] developed an EOQ model for variable rate of deterioration having a ramp type demand rate. Kawaktsu [2010] presented a paper with ramp type demand and finite planning horizon. Pathak et al. [2010] developed a model with Weibull deterioration and shortages. Chang et al. [2010] considered a partial backlogging, inflation in their model. Pathak et al. [2010] developed a model for three plants with time-dependent fuzzy inflation and inflation-dependent demand by using interval arithmetic and random deterioration with partial backlogging and learning effects. Chen [1985] used function principle for operations on fuzzy numbers and Chen et. al. [1998] proposed a paper for graded mean integration representation of generalized fuzzy numbers. Mahata et. al. [2010] and Chen et al. [2005] presented a model by using graded mean integration representation and function principle.

An EOQ model with permissible delay in payments was developed by Goyal [1985] where he did not consider the difference between the selling price and purchasing cost. Goyal's model was improved by Dave [1985] under the assumption that the selling price is higher than the purchase price. Inventory models for optimal pricing and ordering policies for the retailers with trade credit were formulated by Whang et.al. [1997] and Liao et al. [2000]. Considering the difference between unit sell price and unit purchase cost, Jamal et al. [1997 and 2000] and Sarkar et al. [2000] suggested that the retailer should settle the account as soon as the unit selling price increases relative to the unit cost. Chang et al. [2003] have suggested a model under trade credit if the order quantity is greater than or equal to pre-determined quantity. Ouyang et. al. [2006], Chang et al. [2006], Chung and Huang [2009] and Teng et al.[2005] have suggested the strategy of granting credit items by adding not only an additional cost but also default risk to the supplier. Ouyang et al. [2009] have considered trade credit linked to order quantity for deteriorating items. More discussions are given in notes by Mitra et al. [1980], Giri et al. [2000] and Khanna et.al. [2005]. Shah et. al. [2010] presented their model with delayed in payment.

In this paper, an EOQ Inventory model for a deteriorating item with ramp – type demand is developed in fuzzy stochastic environment under inflation and time value of money over a finite planning horizon with single cycle, when delay in payment is allowed to the retailer to settle the accounts against the purchases made by him. Here, the case of the retailers generating revenue on unit selling price, higher than the unit purchase cost, has been considered. In this paper we have considered two cases: (1) payment within the permissible time and (2) payment after the permissible time (i.e. time at which on hand inventory reaches to zero). Here, shortages are allowed and the deterioration follows random Weibull distribution. Under these assumptions, we propose a mathematical model and theorem to find minimum total relevant inventory cost and optimal order quantity. Firstly, we consider the demand and net inflation rate to be crisp in nature. The holding, purchasing, shortage, lost, selling, and ordering costs are represented by triangular fuzzy numbers which are then transformed to corresponding

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weighted interval numbers by using nearest interval approximation. Following interval mathematics, the single objective fuzzy problem is reduced to a crisp multi – objective decision making (MODM) problems. The MODM problem for optimizing the total relevant inventory cost is then again transformed to a crisp single objective problem with the help of weighted sum method. Next, the demand rate and the net inflation rate are taken as trapezoidal fuzzy numbers to make the problem much more realistic and then derive the expressions for the total inventory cost applying Function Principle. It is then defuzzified using graded mean integration representation method to find the possibilistic mean value of the objective i.e. to get the total cost function. Numerical examples are cited to illustrate the developed model and the solution process. Some sensitivity analysis with respect to critical parameters is carried out to observe the changes in the total relevant inventory cost and optimal order quantity. Analyzing these changes, we have applied the learning effects to further improve the optimal order quantity. The percentage of defective rate is reduced with learning effect and due to this reduction the order quantity increases in every consecutive planning horizon. This increment in order quantity follows S-shape learning curve and after a certain number of consecutive cycle, it becomes constant. Finally the result of the objective for crisp demand and crisp net inflation rate with and without learning effects are compared to that for fuzzy demand and fuzzy net inflation rate in both case (1) and case (2).

ASSUMPTIONS AND NOTATIONS
This mathematical model is developed on the basis of the following assumptions and notations:

ASSUMPTIONS
1. Only a single-product item is considered during the planning horizon.
2. Replenishment rate is infinite; thus, replenishment is instanteneous.
3. A Discounted Cash Flow approach is used to consider the various costs at various times.
4. The time horizon is finite with single cycle. Lead time is negligible.
5. Shortages are allowed and partially backlogged. The backlogging rate is a decreasing function of the waiting time. Let the backlogging rate be B (T- t) $= e^{-\delta(T-t)}$, where δ ≥ 0, and (T-t) is the waiting time up to the next replenishment.
6. The random deterioration rate function , $\ddot{\theta}$ (t), represents the on-hand inventory deteriorates per unit time and there is no replacement or repair of deteriorated units during the period T and it satisfies two-parameter Weibull distribution. In the present model, we assume $\ddot{\theta}$ (t) = $\ddot{\alpha} \beta t^{\beta-1}$,β > 1, 0 ≤ t ≤ t_1 and $\ddot{\alpha}$ is a random variable which is a random parameter of defective rate, uniformly distributed with its *p.d.f.* as φ $^{(\alpha)}$ and expected value E $^{(\alpha)}$. φ
$$(\alpha) = \begin{cases} 50, & 0 \le \alpha \le .02 \\ 0, & otherwise \end{cases}$$
   Then, E $^{(\alpha)}$ = 0.01 and E (α^2) = 0.00013,
7. The demand rate D(t) is assumed to be a ramp type function of time:
   D(t) = $D_0 [t - (t - \mu)H(t - \mu)]$, (D_0 > 0 , may be crisp or fuzzy)
   where, H $^{(t-\mu)}$ is the well known Heaviside's function defined as follows:
   $$H(t - \mu) = \begin{cases} 1, & t \ge \mu, \\ 0, & t < \mu. \end{cases}$$
8. During the permissible credit period μ, the retailer can deposit generated sales revenue in an interest bearing account. At the end of this fixed period, the difference between sales price and unit cost is retained by the system to meet the day-to-day expenses. And the account is settled and interest charges are payable on the unsold items in the stock.

NOTATIONS
T   the cycle length
t_1 the length of time in the cycle when on hand inventory level reaches to zero
μ   the permissible credit period for settling the account
I(t)   the inventory level at time t of the cycle ,
L(t)   the amount of lost sale at time t during the time interval [t_1, T]

I_m the maximum inventory level for the cycle
Q^* the optimal order quantity in the cycle i.e. $Q^* = I_m + S_b$.
S_b the maximum shortage quantity for the cycle
i   the inflation rate, may be crisp or fuzzy
r   the discount rate , may be crisp or fuzzy
R   the net discount rate of inflation i.e. R = r – i , may be crisp or fuzzy
$\ddot{C}_o$ the imprecise order cost per order
$\ddot{C}_h$ the imprecise holding cost per unit per unit time
$\ddot{C}_b$ the imprecise backlogging cost per unit per unit time
$\ddot{C}_p$ and C_p the respective imprecise and crisp purchasing cost per unit per unit time
$\ddot{C}_l$ and C_l the respective imprecise and crisp unit cost of lost sales. Note that if the objective is to minimize the cost, then $C_l \succ C_p$, (c.f. Chang et. al.,2010)
$\ddot{P}$ and P   the respective imprecise and crisp selling price per unit with ($P \succ C_p$)
i_c the interest charged per monetary unit in stock per unit time by the supplier
i_e the interest earned per monetary unit per unit time by the retailer, where $i_e < i_c$
TC_o the ordering cost
TC_p the purchasing cost
TC_h the holding cost
TC_2 the deterioration cost
TC_s the shortage cost
TC_l the lost sale cost
$TC(t_1)$ the total relevant inventory cost for μ=t_1
$TC_1(t_1)$ the total relevant inventory cost for μ<t_1
$TC_2(t_1)$ the total relevant inventory cost for μ>t_1
$E(TC(t_1))$ the expected value of $TC(t_1)$
E ($TC_1(t_1)$) the expected value of $TC_1(t_1)$
E ($TC_2(t_1)$) the expected value of $TC_2(t_1)$

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MATHEMATICAL MODEL AND SOLUTION

FIGURE 1 (a): THE GENERAL GRAPHIC REPRESENTATION OF INVENTORY LEVEL WITH PARTIAL BACKLOGGING
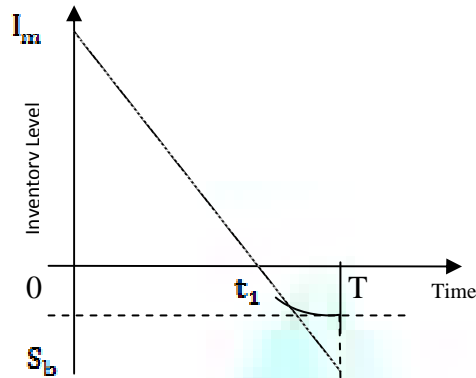
The inventory level at time t during the time interval $[0, t_1]$ is given by the differential equation as follows:

$$dI(t)/dt + \theta(t) I(t) = - D(t), \qquad 0 \le t \le t_1 \tag{1}$$

The shortage level at time t during the time interval $[t_1, T]$ is given by the following differential equation as

$$dI(t)/dt = D(t) B(T-t), \qquad t_1 \le t \le T \tag{2}$$

Case -1 ($\mu \le t_1$): The inventory model for payment before depletion with ramp-type demand D(t) is shown in **figure 1(b)**.

FIGURE 1 (b): THE GRAPHIC REPRESENTATION OF INVENTORY LEVEL WHEN $\mu \le t_1$.
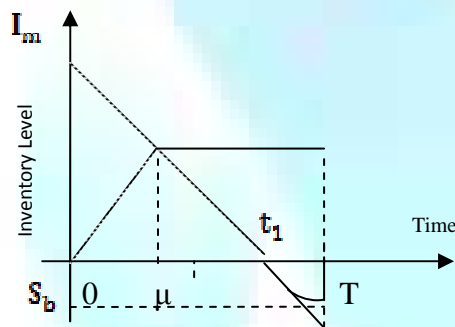
The above differential equations (1), (2) in this case are considered as follows:

$$dI(t)/dt + \alpha\beta t^{\beta-1} I(t) = - D_0 t, \qquad 0 \le t \le \mu \tag{3}$$

$$dI(t)/dt + \alpha\beta t^{\beta-1} I(t) = - D_0 \mu, \qquad \mu \le t \le t_1 \tag{4}$$

$$dI(t)/dt = D_0 \mu e^{-\delta(T-t)}, \qquad t_1 \le t \le T \tag{5}$$

Furthermore, by using the conditions $I(0) = I_m$ and $I(t_1) = 0$, the solutions of equations (3),(4) and (5) are respectively given by

$$I(t) = I_m e^{-\alpha t^\beta} - D_0 e^{-\alpha t^\beta} \int_0^t x e^{\alpha x^\beta} dx, \qquad 0 \le t \le \mu \tag{6}$$

$$I(t) = D_0 \mu (t_1 + \alpha t_1^{\beta+1}/(\beta+1)) e^{-\alpha t^\beta} - D_0 \mu e^{-\alpha t^\beta}(t + \alpha t^{\beta+1}/(\beta+1)), \qquad \mu \le t \le t_1 \tag{7}$$

$$I(t) = (D_0 \mu/\delta)\left[e^{-\delta(T-t)} - e^{-\delta(T-t_1)}\right], \qquad t_1 \le t \le T \tag{8}$$

By equality conditions at μ, from equations (6) and (7), we get

$$I_m = D_0 \left[\int_0^\mu x e^{\alpha x^\beta} dx + \mu \int_\mu^{t_1} e^{\alpha x^\beta} dx\right] \tag{9}$$

and the amount of lost sale at time t during the time interval $[t_1, T]$ is

$$L(t) = D_0 \mu \int_{t_1}^t \left(1 - e^{-\delta(T-x)}\right) dx = D_0 \mu \left[t - t_1 - (1/\delta)\left\{e^{-\delta(T-t)} + e^{-\delta(T-t_1)}\right\}\right], t_1 \le t \le T \tag{10}$$

Let S_b be the minimum shortage quantity in the cycle, from equation (8) we get

$$S_b = I(T) = (D_0 \mu/\delta)\left[1 - e^{-\delta(T-t_1)}\right] \tag{11}$$

The values of all the costs in the entire time horizon are as follows:

$$TC_0 = C_0 \tag{12}$$

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$$TC_s = \check{C}_p I_m + \check{C}_p S_D$$

$$= \check{C}_p D_0 \left[\int_0^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right] + \check{C}_p (D_0 \mu / \delta) \left[1 - e^{-\delta(T-t_1)} \right] \tag{13}$$

$$TC_h = \check{C}_h D_0 \left[\int_0^\mu e^{-a x^\delta} \left[\int_t^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right] e^{-Rt} dt \right] + \mu \check{C}_h D_0 \int_\mu^{t_1} \left[e^{-a x^\delta} \int_t^{t_1} e^{a x^\delta} dx \right] e^{-Rt} dt \right]$$

$$= \left[\check{C}_h D_0 \left[\int_0^\mu e^{-a x^\delta} \left[\int_t^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right] e^{-Rt} dt \right] + \mu \check{C}_h D_0 \int_\mu^{t_1} \left[e^{-a x^\delta} \int_t^{t_1} e^{a x^\delta} dx \right] e^{-RT} dt \right] \tag{14}$$

$$TC_d = \check{C}_p D_0 \left[\left\{ \int_0^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right\} + (e^{-R\mu} - 1)/R^2 + \mu e^{-Rt_1}/R \right]$$

$$= \check{C}_p D_0 \left[\left\{ \int_0^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right\} + (e^{-R\mu} - 1)/R^2 + \mu e^{-Rt_1}/R \right], \tag{15}$$

$$TC_e = \check{C}_s \left(\int_{t_1}^T I(t) e^{-Rt} \, dt \right) = \frac{a_s D_0 \mu}{R} \left[\frac{e^{(R-\delta)(T-t_1)} - 1}{R - \delta} + \frac{e^{-\delta(T-t_1)} - 1}{\delta} \right], \tag{16}$$

$$TC_L = \left[\check{C}_L D_0 \mu \int_{t_1}^T e^{-Rt} \left(1 - e^{-\delta(T-t)} \right) dt \right] = \check{C}_L D_0 \mu \left[\frac{e^{R(T-t_1)} - 1}{R} + \frac{1 - e^{(R-\delta)(T-t_1)}}{R - \delta} \right], \tag{17}$$

The interest earned by the retailer during the time interval [0, μ] due to the deposition of the sold revenue into an interest earning account at the rate i_e in the entire time horizon is as follows:

$$IE_i = \tilde{P} D_0 i_e \left[\int_0^\mu (\mu - t) t e^{-Rt} dt + \mu \int_\mu^{t_1} (t_1 - t) e^{-Rt} dt \right] \qquad\qquad = \tilde{P} D_0 i_e$$

$$\left[\int_0^\mu (\mu - t) t e^{-Rt} dt + \mu \int_\mu^{t_1} (t_1 - t) e^{-Rt} \right] \tag{18}$$

The interest charged by the supplier from the time μ onwards for the unsold items at the rate i_c is

$$IC_i = \check{C}_p D_0 \mu i_c \left[\left(t_1 + \hat{\alpha} \frac{t_1^{\delta+1}}{\delta+1} \right) \int_\mu^{t_1} e^{-\hat{\alpha} t^\delta - Rt} dt - \int_\mu^{t_1} e^{-\hat{\alpha} t^\delta - Rt} \left(t + \hat{\alpha} \frac{t^{\delta+1}}{\delta+1} \right) dt \right]$$

$$= \check{C}_p D_0 \mu i_c \left[\left(t_1 + \hat{\alpha} t_1^{\delta+1}/(\beta+1) \right) \int_\mu^{t_1} e^{-\hat{\alpha} t^\delta - Rt} dt - \int_\mu^{t_1} e^{-\hat{\alpha} t^\delta - Rt} \left(t + \hat{\alpha} t^{\delta+1}/(\beta+1) \right) dt \right], \tag{19}$$

Hence, the value of the total relevant inventory cost in the entire time horizon is

$$TC_1(t_1) = TC_o + TC_p + TC_h + TC_d + TC_e + TC_L + IC_i - IE_i \tag{20}$$

Substituting equations (12) – (19) into equation (20) we obtain $TC_1(t_1) = \check{C}_o + \check{C}_p D_0 \left[\int_0^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right] + \check{C}_p$

$$\frac{D_0 \mu}{\delta} \left[1 - e^{-\delta(T-t_1)} \right] + \left[\check{C}_h D_0 \left[\int_0^\mu e^{-a x^\delta} \left[\int_t^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right] e^{-Rt} dt \right] + \mu \check{C}_h D_0 \int_\mu^{t_1} \left[e^{-a x^\delta} \int_t^{t_1} e^{a x^\delta} dx \right] e^{-RT} dt \right] +$$

$$\check{C}_p D_0 \left[\left\{ \int_0^\mu x e^{a x^\delta} dx + \mu \int_\mu^{t_1} e^{a x^\delta} dx \right\} + \frac{e^{-R\mu} - 1}{R^2} + \frac{\mu e^{-Rt_1}}{R} \right] + D_0 \mu \left[\left(\frac{\check{C}_s}{R} - \check{C}_L \right) \frac{e^{(R-\delta)(T-t_1)} - 1}{R - \delta} + \frac{\check{C}_s}{R} \frac{e^{(R-\delta)(T-t_1)} - 1}{\delta} + \check{C}_L \frac{e^{R(T-t_1)} - 1}{R} \right]$$

$$+ \check{C}_p D_0 \mu i_c \left[\left(t_1 + \hat{\alpha} \frac{t_1^{\delta+1}}{\delta+1} \right) \int_\mu^{t_1} e^{-\hat{\alpha} t^\delta - Rt} dt - \int_\mu^{t_1} e^{-\hat{\alpha} t^\delta - Rt} \left(t + \hat{\alpha} \frac{t^{\delta+1}}{\delta+1} \right) dt \right] - \tilde{P} D_0 i_e \left[\int_0^\mu (\mu - t) t e^{-Rt} dt + \mu \int_\mu^{t_1} (t_1 - t) e^{-Rt} \right], \tag{21}$$

Now expected value of $TC_1(t_1)$, neglecting $E(\alpha^2)$ in onwards terms, is :

$$E(TC_1(t_1)) = \check{C}_o + \check{C}_p D_0 \left[\int_0^\mu x(1 + E(\alpha) x^\delta) dx + \mu \int_\mu^{t_1} (1 + E(\alpha) x^\delta) dx \right] + \check{C}_p \left(D_0 \mu / \delta \right) \left[1 - e^{-\delta(T-t_1)} \right] +$$

$$\left[\check{C}_h D_0 \left[\int_0^\mu (1 - E(\alpha) t^\delta) \left[\int_t^\mu x(1 + E(\alpha) x^\delta) dx + \mu \int_\mu^{t_1} (1 + E(\alpha) x^\delta) dx \right] e^{-Rt} dt \right] + \mu \check{C}_h D_0 \int_\mu^{t_1} \left[(1 - E(\alpha) t^\delta) \int_t^{t_1} (1 + E(\alpha) x^\delta) dx \right] e^{-RT} dt \right] +$$

$$\check{C}_p D_0 \left[\left\{ \int_0^\mu x(1 + E(\alpha) x^\delta) dx + \mu \int_\mu^{t_1} (1 + E(\alpha) x^\delta) dx \right\} + \frac{e^{-R\mu} - 1}{R^2} + \frac{\mu e^{-Rt_1}}{R} \right] + D_0 \mu \left[\left(\frac{\check{C}_s}{R} - \check{C}_L \right) \frac{e^{(R-\delta)(T-t_1)} - 1}{R - \delta} + \frac{\check{C}_s}{R} \frac{e^{(R-\delta)(T-t_1)} - 1}{\delta} + \check{C}_L \frac{e^{R(T-t_1)} - 1}{R} \right]$$

$$+ \check{C}_p D_0 \mu i_c \left[\left(t_1 + E(\alpha) \frac{t_1^{\delta+1}}{\delta+1} \right) \int_\mu^{t_1} (1 - E(\alpha) t^\delta) e^{-Rt} dt - \int_\mu^{t_1} (1 - E(\alpha) t) e^{-Rt} \left(t + E(\alpha) \frac{t^{\delta+1}}{\delta+1} \right) dt \right] - \tilde{P} D_0 i_e \left[\int_0^\mu (\mu - t) t e^{-Rt} dt + \mu \int_\mu^{t_1} (t_1 - t) e^{-Rt} \right]$$

(22)   Following Grzegorzewski [2008] and Maity et. al. [2005],the fuzzy numbers are transformed to interval numbers and by using Lemma 1 (**Appendix A**), the expression (22) is minimized as

$$\text{Minimize } [E(TC_{1L}(t_1), E(TC_{1R}(t_1))] \tag{23}$$

where $\quad E(TC_{1L}(t_1)) = \{ E(TC_1(t_1)) \text{ with cost } C_{oL}, C_{pL}, C_{hL}, C_{sL}, C_{LL}, P_L \}$ \tag{24}

and $\quad E(TC_{1R}(t_1)) = \{ E(TC_1(t_1)) \text{ with cost } C_{oR}, C_{pR}, C_{hR}, C_{sR}, C_{LR}, P_R \}$ \tag{25}

In the case of minimization, multi-optimization problem, is formulated in a conservative sense as

$$\text{Minimize } [E(TC_{1C}(t_1)), E(TC_{1R}(t_1))] \tag{26}$$

where, $E(TC_{1C}(t_1)) = [E(TC_{1L}(t_1)) + E(TC_{1R}(t_1))]/2,$ \tag{27}

The interval optimization problem (26) is a multi-objective problem which is converted to a single-objective problem by using the weighted sum method with weights w_1 and w_2 as

$$\text{Minimize } E(TC_{1CR}(t_1)) = [w_1 E(TC_{1C}(t_1)) + w_2 E(TC_{1R}(t_1))], \tag{28}$$

where, $w_1 + w_2 = 1$, with proper choice of $w_1, w_2 > 0$

THE SINGLE-OBJECTIVE PROBLEM WHICH IS MINIMIZED AS FOLLOWS

There is one variable in the present value of the total inventory cost $E(TC_{1CR}(t_1))$, that is the time t_1, $t_1 \leq t \leq T$, which is a continuous variable. The condition for $E(TC_{1CR}(t_1))$ to be minimized is that $dE(TC_{1CR}(t_1))/dt_1 = 0 = g_1(t_1)$, (say). Consequently, we obtain

$$g_1(t_1) = C_p D_0 \mu(1 + E(\alpha) t_1^\delta) + \mu C_h D_0 (1 + E(\alpha) t_1^\delta) \int_0^{t_1} (1 - E(\alpha) t^\delta) e^{-Rt} dt +$$

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$$C_pD_0\mu\left[(1+E(\alpha)t_1^\delta)-e^{-Rt_2}\right]-D_0\mu\left[(C_p-(C_s/R))e^{-S(T-t_2)}+((C_s/R)-C_L)e^{(R-S)(T-t_2)}+C_L e^{R(T-t_2)}\right]+$$

$$C_pD_0i_c\mu(1+\alpha t_1^\delta)\int_\mu^{t_2}(1-E(\alpha)t^\delta)e^{-Rt}dt-PD_0i_c\mu\int_\mu^{t_1}e^{-Rt}dt=0,\qquad\qquad(29)$$

It is verified that $d^2E\{TC_{jCR}(t_1)\}/dt_1^2>0.$ Putting $t_2=\mu$ in equation (29), we get

$$g_2(\mu)=C_p(1+E(\alpha)\mu^\delta)+C_he^{E(\alpha)\mu^\delta}\int_0^\mu(1-E(\alpha)t^\delta)e^{-Rt}dt+C_p\left[(1+E(\alpha)\mu^\delta)-e^{-R\mu}\right]-\left[(C_p-(C_s/R))e^{-S(T-\mu)}+((C_s/R)-C_L)e^{(R-S)(T-\mu)}+C_L e^{R(T-\mu)}\right]e^{-RT}$$

$$(30)$$

where, C_s,C_p,C_h,C_s,C_L,P are crisp value (c.f. **Appendix A**).

Case – 2 ($\mu>t_1$) : The inventory model for payment after depletion with ramp-type demand D(t) is shown in **figure 1(c).** The differential equations (1), (2) in this case are considered as follows:

$$dI(t)/dt+\hat\alpha\beta\,t^{\beta-1}\,I(t)=-D_0t,\qquad 0\le t\le t_1\qquad\qquad(31)$$

$$dI(t)/dt=D_0te^{-S(\mu-t)},\qquad t_1\le t\le\mu\qquad\qquad(32)$$

$$dI(t)/dt=D_0\mu e^{-S(T-t)},\qquad \mu\le t\le T\qquad\qquad(33)$$

FIGURE 1 (c): THE GRAPHIC REPRESENTATION OF INVENTORY LEVEL WHEN $\mu>t_1$.
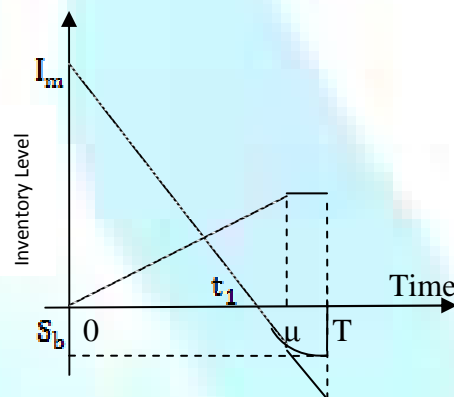
Furthermore, by using the conditions I(0) = I_m and I(t_1) = 0, the solutions of equations (31),(32) and (33) are respectively given by

$$I(t)=D_0e^{-\hat\alpha t^\beta}\int_t^{t_1}xe^{\hat\alpha x^\beta}dx,\qquad 0\le t\le t_1\qquad\qquad(34)$$

$$I(t)=D_0\int_{t_1}^t te^{-S(\mu-t)}dt,\qquad t_1\le t\le\mu\qquad\qquad=(D_0\mu/\delta)$$

$$\left[te^{-S(\mu-t)}-t_1e^{-S(\mu-t_1)}\right]-(D_0/\delta^2)\left[e^{-S(\mu-t)}-e^{-S(\mu-t_1)}\right],\qquad\qquad(35)$$

$$I(t)=(D_0/\delta)\left[e^{-S(T-t)}-e^{-S(T-t)}\right]+I(\mu),\qquad \mu\le t\le T\qquad\qquad(36)$$

$$=(D_0/\delta)\left(\mu-t_1e^{-S(\mu-t_1)}\right)+(D_0\mu/\delta)\left(e^{-S(T-t)}-e^{-S(T-t)}\right)-(D_0/\delta^2)\left[1-e^{-S(\mu-t_1)}\right],\qquad\qquad(37)$$

From equation (34), we get, $I_m=I(0)=D_0\int_0^{t_1}xe^{\hat\alpha x^\beta}dx\qquad\qquad(38)$

Now, the amount of lost sale at time t during the time interval [t_1,μ] and [μ,T] are respectively

$$L_1(t)=D_0\int_{t_1}^t x\left(1-e^{-S(\mu-x)}\right)dx,\qquad t_1\le t\le\mu$$

$$=D_0\left[(t^2-t_1^2)/2-(1/\delta)\left\{te^{-S(\mu-t)}+t_1e^{-S(\mu-t_1)}\right\}+(1/\delta^2)\left\{e^{-S(\mu-t)}-e^{-S(\mu-t_1)}\right\}\right],\qquad\qquad(39)$$

and, $L_2(t)=D_0\mu\int_\mu^t\left(1-e^{-S(T-x)}\right)dx=D_0\mu\left[(t-\mu)-(1/\delta)\left\{e^{-S(T-t)}-e^{-S(T-t)}\right\}\right],\mu\le t\le T\qquad\qquad(40)$

From equation (37) we get

$$S_b=I(T)=(D_0/\delta)\left(\mu\left(1-e^{-S(T-t)}\right)+\left(\mu-t_1e^{-S(\mu-t_1)}\right)-(1/\delta)\left[1-e^{-S(\mu-t_1)}\right]\right),\qquad\qquad(41)$$

The values of all the costs in the entire time horizon are

TC_0= same as in equation(12).   (42)

$$TC_b=\check C_pI_m+\check C_sS_b$$

$$=\check C_pD_0\left[\int_0^{t_1}xe^{\hat\alpha x^\beta}dx\right]+\check C_sD_0\left[\frac\mu\delta(1-e^{-S(T-t)})+\frac2\delta(\mu-t_1e^{-S(\mu-t_1)})-\frac2{\delta^2}\left[1-e^{-S(\mu-t_1)}\right]\right],$$

$$(43)$$

$$TC_h=\check C_hD_0\left[\int_0^{t_1}e^{-\hat\alpha t^\beta}\left[\int_t^{t_1}xe^{\hat\alpha x^\beta}dx\right]e^{-Rt}dt\right]$$

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$$= \check{C}_h D_o \int_0^{t_1} e^{-Rt^2} \left[\int_t^{t_1} x e^{\Xi x^\delta} dx\right] e^{-Rt} dt,\tag{44}$$

$$TC_d = \check{C}_p D_o \left[\int_0^{t_1} x e^{\Xi x^\delta} dx + (e^{-Rt_1} - 1)/R + (t_1 e^{-Rt_1})/R\right]$$

$$= \check{C}_p D_o \left[\int_0^{t_1} x e^{\Xi x^\delta} dx + (e^{-Rt_1} - 1)/R + (t_1 e^{-Rt_1})/R\right],\tag{45}$$

$$TC_a = \check{C}_s \left[\int_{t_1}^\mu I(t)e^{-Rt} dt + \int_\mu^T I(t)e^{-Rt} dt\right] =$$

$$=$$

$$\check{C}_s D_o \left[\mu \int_\mu^T e^{-\delta(T-t)-Rt} dt - \{\mu(e^{-\delta(T-\mu)}) - (\mu - t_1 e^{-\delta(\mu-t_1)}) + (1/\delta)(1-e^{-\delta(\mu-t_1)})\} \int_\mu^T e^{-Rt} dt - \{(t_1 e^{-\delta(\mu-t_1)}) - (1/\delta)(e^{-\delta(\mu-t_1)})\} \int_{t_1}^\mu e^{-Rt} dt + \int_{t_1}^\mu e^{-\delta(\mu-t)-Rt} dt - (1/\delta)\int_{t_1}^\mu e^{-\delta(\mu-t)-Rt} dt\right](1/\delta)$$

$$,\tag{46}$$

$$TC_L = \left[\check{C}_L D_o \int_{t_1}^\mu t e^{-Rt}\left(1-e^{-\delta(\mu-t)}\right)dt + \check{C}_L D_o \mu \int_\mu^T e^{-Rt}\left(1-e^{-\delta(T-t)}\right)dt\right]$$

$$= \left[\check{C}_L D_o \int_{t_1}^\mu t e^{-Rt}\left(1-e^{-\delta(\mu-t)}\right)dt + \check{C}_L D_o \mu \int_\mu^T e^{-Rt}\left(1-e^{-\delta(T-t)}\right)dt\right],\tag{47}$$

$$IE_z = \check{P} D_o i_e \left[\int_0^{t_1}(t_1-t)t e^{-Rt} dt + (\mu-t_1)\int_0^{t_1} t\,dt \times \int_{t_1}^\mu e^{-Rt} dt\right]$$

$$= \check{P} D_o i_e \left[\int_0^{t_1}(t_1-t)t e^{-Rt} dt + (\mu-t_1)\int_0^{t_1} t\,dt \times \int_{t_1}^\mu e^{-Rt} dt\right],\tag{48}$$

Here, the retailer sells all the monetary units by the end of the cycle time t_1 and pays the supplier in full by the end of the credit period μ. So, $IC_z = 0$,

$$\tag{49}$$

Hence, the value of the total relevant inventory cost in the entire time horizon is

$$TC_z(t_1) = \left(TC_o + TC_p + TC_h + TC_d + TC_a + TC_L + IC_z - IE_z\right)\tag{50}$$

Substituting equations (12) and (43) – (49) into equation (50) we obtain

$$TC_z(t_1) = \check{C}_o + \check{C}_p D_o \left[\int_0^{t_1} x e^{\Xi x^\delta} dx\right] + ($$

$$\check{C}_h D_o/\delta) \left[\mu(1-e^{-\delta(T-\mu)}) + (\mu - t_1 e^{-\delta(\mu-t_1)}) - (1/\delta)\left[1-e^{-\delta(\mu-t_1)}\right]\right] + \check{C}_h D_o \left[\int_0^{t_1} e^{-Rt^2}\left[\int_t^{t_1} x e^{\Xi x^\delta} dx\right]e^{-Rt} dt\right] + \left[\int_0^{t_1} x e^{\Xi x^\delta} dx + (e^{-Rt_1} - 1)/R^2 + t_1 e^{-Rt_1}/R\right]\check{C}_p D_o$$

$$+$$

$$(\check{C}_s D_o/\delta)\left[\mu \int_\mu^T e^{-\delta(T-t)-Rt} dt - \{\mu e^{-\delta(T-\mu)} - (\mu - t_1 e^{-\delta(\mu-t_1)}) + (1/\delta)(1-e^{-\delta(\mu-t_1)})\} \int_\mu^T e^{-Rt} dt - \{(t_1 e^{-\delta(\mu-t_1)}) - (1/\delta)(e^{-\delta(\mu-t_1)})\}\int_{t_1}^\mu e^{-Rt} dt + \int_{t_1}^\mu e^{-\delta(\mu-t)-Rt} dt - (1/\delta)\int_{t_1}^\mu e^{-\delta(\mu-t)-Rt} dt\right] + \left[\check{C}_L D_o \int_{t_1}^\mu t e^{-Rt}\left(1-e^{-\delta(\mu-t)}\right)dt + \check{C}_L D_o \mu \int_\mu^T e^{-Rt}\left(1-e^{-\delta(T-t)}\right)dt\right] -$$

$$\check{P} D_o i_e \left[\int_0^{t_1}(t_1-t)t e^{-Rt} dt + (\mu-t_1)\int_0^{t_1} t\,dt \times \int_{t_1}^\mu e^{-Rt} dt\right],\tag{51}$$

Now, expected value of $TC_z(t_1)$ is

$$E(TC_z(t_1)) = \check{C}_o + \check{C}_p D_o \left[\int_0^{t_1} x(1+E(\alpha)x^\delta)dx\right] +$$

$$(\check{C}_h D_o/\delta)\left[\mu(1-e^{-\delta(T-\mu)}) + (\mu - t_1 e^{-\delta(\mu-t_1)}) - (1/\delta)\left[1-e^{-\delta(\mu-t_1)}\right]\right] + \check{C}_h D_o \left[\int_0^{t_1}(1-E(\alpha)t^\delta)\left[\int_t^{t_1} x(1+E(\alpha)x^\delta)dx\right]e^{-Rt} dt\right] +$$

$$\check{C}_p D_o \left[\int_0^{t_1} x(1+E(\alpha)x^\delta)dx + (e^{-Rt_1} - 1)/R^2 + t_1 e^{-Rt_1}/R\right] +$$

$$\check{C}_s D_o \left[\mu \int_\mu^T e^{-\delta(T-t)-Rt} dt - \{\mu(e^{-\delta(T-\mu)}) - (\mu - t_1 e^{-\delta(\mu-t_1)}) + (1/\delta)(1-e^{-\delta(\mu-t_1)})\} \int_\mu^T e^{-Rt} dt - \{(t_1 e^{-\delta(\mu-t_1)}) - (1/\delta)(e^{-\delta(\mu-t_1)})\}\int_{t_1}^\mu e^{-Rt} dt + \int_{t_1}^\mu e^{-\delta(\mu-t)-Rt} dt - (1/\delta)\int_{t_1}^\mu e^{-\delta(\mu-t)-Rt} dt\right](1/\delta) + \left[\check{C}_L D_o \int_{t_1}^\mu t e^{-Rt}\left(1-e^{-\delta(\mu-t)}\right)dt + \check{C}_L D_o \mu \int_\mu^T e^{-Rt}\left(1-e^{-\delta(T-t)}\right)dt\right] -$$

$$\check{P} D_o i_e \left[\int_0^{t_1}(t_1-t)t e^{-Rt} dt + (\mu-t_1)\int_0^{t_1} t\,dt \times \int_{t_1}^\mu e^{-Rt} dt\right],\text{ neglecting expected values of } \alpha^2, \alpha^3, \alpha^4, \dots,$$

$$\tag{52}$$

Now, the single objective problem E ($TC_{zCR}(t_1)$) obtained from (52) by the procedure similar to case 1 is minimized. Thus,

Minimize E ($TC_{zCR}(t_1)$) = $[w_1 E(TC_{zC}(t_1)) + w_2 E(TC_{zR}(t_1))]$,$\tag{53}$

and $w_1 + w_2 = 1, w_1, w_2 > 0$

The condition for E($TC_{zCR}(t_1)$) to be minimum is that, $dE(TC_{zCR}(t_1))/dt_1 = 0 = g_2(t_1)$ (say).

where, $g_2(t_1) =$

$$C_p e^{E(\alpha)t_1^\delta} + C_h e^{E(\alpha)t_1^\delta}\int_0^{t_1} e^{-E(\alpha)t^\delta-Rt} dt + C_p\left[e^{E(\alpha)t_1^\delta} - e^{-Rt_1}\right] - \left[(C_p - (C_s/R))e^{-\delta(\mu-t_1)} + ((C_s/R) - C_L)e^{-\delta(\mu-t_1)+R(T-t_1)} + C_L e^{R(T-t_1)}\right]e^{-RT} -$$

$$Pi_e \left[(\mu - (3/2)t_1)\int_{t_1}^\mu e^{-Rt} dt - (\mu - t_1)(t_1/2)e^{-Rt_1}\right]$$

$$= 0,\tag{54}$$

It is verified that $d^2E(TC_{zCR}(t_1))/dt_1^2 > 0$.

and, $g_2(\mu) = C_p e^{E(\alpha)\mu^\delta} + C_h e^{E(\alpha)\mu^\delta}\int_0^\mu e^{-E(\alpha)t^\delta-Rt} dt + C_p\left[e^{E(\alpha)\mu^\delta} - e^{-R\mu}\right] - \left[(C_p - (C_s/R)) + (C_s/R)e^{(R)(T-\mu)}\right]e^{-RT}$,$\tag{55}$

For the inventory model, the optimal replenishment time is always attained as t_1^*, where t_1^* is the unique solution for both $g_1(t_1) = 0$ and $g_2(t_1) = 0$. Now, the conditions for $\mu \le t_1^*$ and $t_1^* < \mu$ are verified by using the following two theorems:

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Theorem 1: If $g_2(\mu) \leq 0$, then there exists a unique solution $t_1^* \geq \mu$, which is the minimum point, where $\mu \leq t_1^* < T$, such that $E(TC_{1CR}(t_1^*))$ is obtaining the minimum value. With this value of t_1^*,

$$I_{m'} = D_0 \left[\int_0^{t_1^*} x(1 + E(\alpha)x^\beta)dx + \mu \int_\mu^{t_1^*}(1 + E(\alpha)x^\beta)dx \right], \tag{56}$$

and, $$Q^* = D_0 \left[\int_0^{t_1^*} x(1 + E(\alpha)x^\beta)dx + \mu \int_\mu^{t_1^*}(1 + E(\alpha)x^\beta)dx \right] + (D_0\mu/\delta)\left[1 - e^{-\delta(T - t_1^*)}\right] \tag{57}$$

Theorem 2: If $g_2(\mu) > 0$, then there exists a unique solution $t_1^* < \mu$, which is the minimum point, where $t_1^* < \mu < T$, such that $E(TC_{2CR}(t_1^*))$ is obtaining the minimum value.

Similarly, as in case-1, we can take (t_1^*) as the optimal solution to $E(TC_{2CR}(t_1))$, and $$I_{m'} = D_0 \int_0^{t_1^*} xe^{E(\alpha)x^\beta}dx,$$ (58)

$$Q^* = D_0 \left[\int_0^{t_1^*} xe^{E(\alpha)x^\beta}dx \right] + \frac{D_0}{\delta}\left(1 - e^{-\delta(T - t_1^*)}\right) + \frac{D_0}{\delta}\left(\mu - t_1^* e^{-\delta(\mu - t_1^*)}\right) - \frac{D_0}{\delta^2} \tag{59}$$

MODEL CLASSIFICATION
Here, we have considered two models.

MODEL – 1 (FUZZY STOCHASTIC MODEL WITH CRISP DEMAND AND INFLATION)

Here we Minimize $E(TC_{2CR}(t_1))$ for $\mu < t_1$, Minimize $E(TC_{CR}(t_1))$ for $\mu = t_1$ and Minimize $E(TC_{2CR}(t_1))$ for $\mu > t_1$, with the help of the methods mentioned above.

MODEL –2 (FUZZY STOCHASTIC MODEL WITH FUZZY DEMAND AND INFLATION)

Here, we suppose that $\tilde{D}_0 = (D_{01}, D_{02}, D_{03}, D_{04})$, $\tilde{r} = (r_1, r_2, r_3, r_4)$, $\tilde{I} = (i_1, i_2, i_3, i_4)$, $\tilde{R} = (R_1, R_2, R_3, R_4)$ are non-negative trapezoidal fuzzy numbers. So, fuzzy total relevant inventory costs for $\mu < t_1$, $\mu = t_1$ and $\mu > t_1$ are respectively found by the process used in model – 1 along with function principle as:

$$E\left(\overline{TC_{2CR}}(t_1)\right) = [E(TC_{2CR}(t_1))_1, E(TC_{2CR}(t_1))_2, E(TC_{2CR}(t_1))_3, E(TC_{2CR}(t_1))_4],$$
$$E\left(\overline{TC_{CR}}(t_1)\right) = [E(TC_{CR}(t_1))_1, E(TC_{CR}(t_1))_2, E(TC_{CR}(t_1))_3, E(TC_{CR}(t_1))_4],$$
$$E\left(\overline{TC_{2CR}}(t_1)\right) = [E(TC_{2CR}(t_1))_1, E(TC_{2CR}(t_1))_2, E(TC_{2CR}(t_1))_3, E(TC_{2CR}(t_1))_4],$$

Now, using Graded Mean Integration Representation method (c.f. Chen et.al.(2005)), the possibilistic mean value of the fuzzy total relevant inventory costs are expressed by $P(E(\overline{TC_{2CR}}(t_1)))$, $P(E(\overline{TC_{CR}}(t_1)))$ and $P(E(\overline{TC_{2CR}}(t_1)))$.

IMPERFECT QUALITY WITH LEARNING EFFECTS

Jaber et al. [17], have considered learning effects on an economic order quantity for items with imperfect quality. However $\tilde{\alpha}$ is replaced with $\alpha(k)$ which is the percentage of defective per shipment k in $\tilde{E}(t)$. For example $\alpha(k)$ is expressed using the S-shaped logistic learning curve model as follows:
$\alpha(k) = \dfrac{\alpha_1}{\alpha_2 + e^{\alpha_3 k}}$ where $\alpha_1, \alpha_2, \alpha_3$ are positive model parameters, k is the cumulative number of shipments and $\alpha(k)$ is the percentage defective per shipment k.

NUMERICAL EXAMPLES (USING LINGO SOFTWARE)

Now, we try to verify our models using numerical examples for two cases:

(A) Without Learning Effects,   **(B)** With Learning Effects.

(A) WITHOUT LEARNING EFFECTS

OPTIMUM RESULTS OF MODEL- 1
To illustrate the model -1, let us consider the following parametric values:

R= 0.15, T = 1 year, β = 3, δ = 0.02, D_0 = 500, i_c = 0.08\$, i_s = 0.13\$, α_1 = 70.067, α_2 = 7005.50, α_3 = 0.7932, $\tilde{C}_o$ = (195, 245, 275), $\tilde{C}_s$ = (1, 2, 5), $\tilde{C}_p$ = (1, 3, 9), $\tilde{C}_h$ = (0.5, 1.50, 2.50), $\tilde{C}_L$ = (12, 16, 28), $\tilde{P}$ = (6, 12, 22). Weighted interval numbers with weight q = 0.5 are (C_{oL}, C_{oR}) = (220, 260), (C_{sL}, C_{sR}) = (1.5, 3.5), (C_{pL}, C_{pR}) = (2, 6), (C_{hL}, C_{hR}) = (1, 2), (C_{LL}, C_{LR}) = (14, 22), (P_L, P_R) = (9, 17), C_o = 250\$/order, C_s = 5\$/unit, C_h = 1.75\$/unit/year, C_p = 3\$/unit/year, C_L = 20 \$/unit/year, P = \$15 **(c.f. Appendix A)**, and $w_1 = w_2 = 0.5$.

Example 1; when ($\mu = t_1 - 0.12 < t_1$): The above parametric data satisfy theorem - 1. The optimal results are $t_1^* = 0.430009$ years, $Q^* = 130.4894$ and $E(TC_1(t_1^*)) = \$1567.173$.

Example 2; when ($\mu = t_1 + 0.12 > t_1$): The above parametric data satisfy Theorem -2. The optimal results are: $t_1^* = 0.388964$ years, $Q^* = 189.0874$ and $E(TC_2(t_1^*)) = \$795.48.60$.

Example 3: when ($\mu = t_1$). The above parametric data satisfy Theorem -1. The optimal results are $t_1^* = 0.418578$ years, $Q^* = 164.7955$ and $E(TC(t_1^*)) = \$1682.576$.

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SENSITIVITY ANALYSIS OF MODEL-1

In this section, we perform sensitivity analysis by changing system parameters α, β, δ, R, D_0, one at a time by -20% , -50% , 20% and 50% to investigate their influence on minimum total relevant cost, the optimal order quantity and replenishment number for $\mu < t_1$, $\mu > t_1$ and $\mu = t_1$ shown respectively in examples -1, 2 and 3 of TABLE-1 . The estimated values of the minimum total relevant costs for the three examples can be represented by $E(TC_1(t_1^*))$, $E(TC_2(t_2^*))$, $E(TC(t_1^*))$ respectively, and   the optimal order quantity can be represented by Q' Let,   for   the   each   minimum   total   relevant   cost, estimated value/optimal value = z and $Q'/Q^* $= y.

TABLE 1: SENSITIVITY ANALYSIS OF MODEL-1

Parameter		Percentage of under and over estimated parameters of Example -1,Example- 2 and example -3								
		Example -1			Example- 2			example -3		
		-50 , -20	0	+20 , +50	-50 , -20	0	+20 , +50	-50 , -20	0	+20 , +50
E(α)	y	1.0020,1.0008	1	0.9992,0.9968	1.0007,1.0003	1	0.9997,0.9993	1.0012, 1.0005	1	0.9995, 0.9987
	z	1.0016,1.0007	1	0.9993,0.9974	0.9999,0.9999	1	1.0000,1.0001	1.0015, 1.0006	1	0.9994, 0.9985
β	y	0.9903,0.9974	1	1.0016,1.0028	0.9956,0.9989	1	1.0006,1.0011	0.9937, 0.9984	1	1.0010, 1.0017
	z	0.9923,0.9979	1	1.0013,1.0023	1.0006,1.0001	1	0.9999,0.9998	0.9928, 0.9981	1	1.0012, 1.0021
δ	y	0.9655,0.9865	1	1.0131,1.0312	0.9979,0.0002	1	1.0008,1.0020	0.9773, 0.9911	1	1.0086, 1.0210
	z	0.9664,0.9867	1	1.0131,1.0323	1.9038,1.2247	1	0.8515,0.7049	0.9652, 0.9862	1	1.0136, 1.0335
R	y	1.2621,1.1057	1	0.8943,0.7377	1.1248,1.0514	1	0.9474,0.8678	1.1716, 1.0699	1	0.92950.8239
	z	1.2450,1.0920	1	0.9151,0.7996	2.1585,1.2557	1	0.8377,0.6781	1.2407, 1.0902	1	0.9170, 0.8044
D_0	y	0.4999,0.7999	1	1.1999,1.4999	0.5000,0.8000	1	1.2000,1.5000	0.5000, 0.7999	1	1.2000,1.5000
	z	0.5798,0.8319	1	1.1681,1.4202	0.4971,0.7988	1	1.2012,1.5029	0.5744, 0.8297	1	1.1703, 1.4256

For $\mu < t_1$: The optimal order quantity and minimum total relevant cost increase as β, D_0, δ increase. But they decrease as R , E(α) increase. They are more sensitive on the change in E(α), R , β, D_0, δ to other parameters.

For $\mu > t_1$: The optimal order quantity increases as β , D_0, δ increases. But it decreases as E(α), R increase. It is more sensitive on the change in R, D_0 to other parameters. The minimum total relevant cost increases as E(α), D_0 increases. But it decreases as β , R, δ increases. It is more sensitive on the change in δ, R, D_0 to the other parameters.

For, ($\mu = t_1$): The optimal order quantity and minimum total relevant cost increase as β , δ , D_0 increases. But they decrease as E(α), R increase. They are more sensitive on the change in D_0 to other parameters.

OPTIMUM RESULTS OF MODEL- 2

$\bar{D}_0 = (400,450,550,600)$ and $\bar{R} = (0.13,0.14,0.16,0.17)$. And other parameters are as in model-1.

Example – 1; $(\mu = t_1 = 0.12)$: $t_1^* = (0.45718,0.443469,0.416804,0.403850)$, $Q^* = (111.7530,121.5831,138.4752,145.5466)$, $E(TC_1(t_1^*))^* = (1379.64,1477.573,1648.779,1722.710)$. $P(t_1^*)$ =0.430263, $P(Q^*)$ = 129.5694, $P(E(TC_1(t_1^*))^*)$ =1559.176.

Example – 2; $(\mu = t_1 + 0.12)$: $t_2^* = (0.416088,0.402396,0.375789,0.362870)$, $Q^* = (156.4809,173.1227,204.3716,218.9737)$, $E(TC_2(t_2^*))^* = (73426.54,76653.16,82172.72,84568.36)$. $P(t_2^*)$= 0.38922, $P(Q^*)$ =188.4072, $P(E(TC_2(t_2^*))^*)$ =79274.44.

Example – 3; $(\mu = t_1)$: $t_1^* = (0.445578,0.431950,0.405458,0.392590)$, $Q^* = (137.9916,151.7858,177.0202,188.4618)$, $E(TC(t_1^*))^* = (1475.947,1583.627,1773.165,1855.743)$. $P(t_1^*)$ =0.418831, $P(Q^*)$ =164.0109, $P(E(TC(t_1^*))^*)$ = 1674.212.

On comparing the objective results of the crisp inflation and demand with fuzzy inflation and demand (without learning effect); it is clear that the objective results with fuzzy inflation and demand are better than the crisp one in all the three examples.

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(B) WITH LEARNING EFFECTS
OPTIMUM RESULTS OF MODEL- 1

TABLE 2: DIFFERENT NUMBER OF SHIPMENTS WITH LEARNING EFFECT FOR EXAMPLE-1, 2 AND 3

k	Example - 1; $(\mu = t_1 - 0.12)$			Example – 2; $(\mu = t_1 + 0.12)$			Example -3; $(\mu = t_1)$		
	t_1^*	Q^*	$E(TC_1(t_1^*))$	t_1^*	Q^*	$E(TC_1(t_1^*))$	t_1^*	Q^*	$E(TC(t_1^*))$
1	0.430010	130.4894	1567.174	0.388964	189.0875	79548.60	0.418577	164.7956	1682.577
2	0.430010	130.4896	1567.176	0.388965	189.0876	79548.59	0.418578	164.7957	1682.579
3	0.430012	130.4901	1567.180	0.388966	189.0878	79548.58	0.418579	164.7960	1682.583
4	0.430014	130.4910	1567.190	0.388968	189.0883	79548.55	0.418582	164.7968	1682.592
5	0.430021	130.4932	1567.211	0.388972	189.0894	79548.49	0.418588	164.7984	1682.612
6	0.430034	130.4978	1567.256	0.388983	189.0919	79548.36	0.418600	164.8020	1682.655
7	0.430064	130.5077	1567.355	0.389005	189.0972	79548.07	0.418627	164.8096	1682.748
8	0.430125	130.5283	1567.559	0.389050	189.1081	79547.47	0.418684	164.8254	1682.942
9	0.430244	130.5683	1567.957	0.389140	189.1294	79546.31	0.418793	164.8562	1683.319
10	0.430447	130.6370	1568.639	0.389292	189.1659	79544.32	0.418980	164.9089	1683.964
11	0.430731	130.7326	1569.589	0.389505	189.2167	79541.55	0.419241	164.9824	1684.863
12	0.431030	130.8333	1370.591	0.389729	189.2701	79538.62	0.419515	165.0598	1685.811
13	0.431265	130.9126	1571.380	0.389905	189.3122	79536.31	0.419732	165.1207	1686.556
14	0.431411	130.9619	1571.870	0.390014	189.3383	79534.87	0.419866	165.1586	1687.020
15	0.431489	130.9881	1572.131	0.390073	189.3522	79534.10	0.419938	165.1788	1687.267
16	0.431527	131.0010	1572.259	0.390101	189.3590	79533.73	0.419973	165.1887	1687.388
17	0.431545	131.0070	1572.319	0.390115	189.3622	79533.55	0.419989	165.1933	1687.445
18	0.431554	131.0098	1572.347	0.390121	189.3637	79533.47	0.419997	165.1954	1687.471
19	0.431557	131.0111	1572.360	0.390124	189.3643	79533.43	0.420000	165.1964	1687.483
20	0.431559	131. 0116	1572.365	0.390125	189.3646	79533.41	0.420002	165.1969	1687.488
21	0.431560	131. 0119	1572.368	0.390125	189.3648	79533.41	0.420003	165.1972	1687.491
22	0.431560	131. 0120	1572.369	0.390125	189.3648	79533.40	0.42003	165.1972	1687.492
23	0.431560	131. 0121	1572.370	-	-	-	-	-	-
24	0.431560	131. 0121	1572.370	-	-	-	-	-	-

It is clear from TABLE 2 that optimum quantity is increased with learning effect in all the three examples. In example 1 it increased from 130.4894 to 131.0121 after the 24 consecutive shipments. After that it is being constant. In example 2 it increased from 189.0875 to 189.3648 after the 22 consecutive shipments. After that it is being constant. In example 3 it increased from 164.7956 to 165.1972 after the 22 consecutive shipments. After that it is being constant. So, on applying the learning effect in both the models on deterioration rate to reduce the percentage of defective, it is analyzed that percentage of optimum quantity is increasing in each shipment due to this reduction.

Learning curves of all the three examples of model – 1 are shown in Figure-3 for optimum order quantity against number of shipments.

Figure -3(a): *Example – 1;* $(\mu = t_1 - 0.7425)$ ***Figure -3(b):*** *Example – 2;* $(\mu = t_1 + 0.12)$
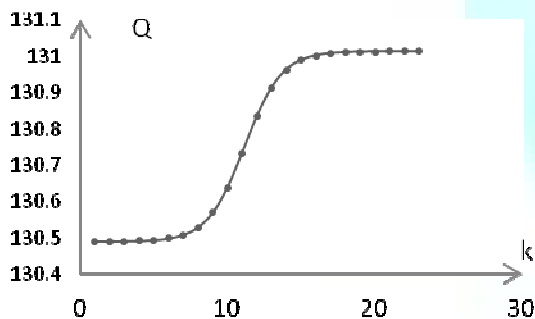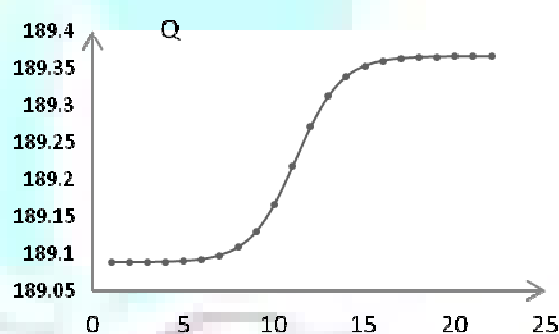
Figure -3(c): *Example – 3;* $(\mu = t_1)$
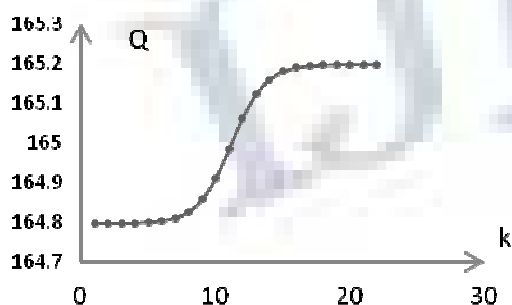
Optimum quantity of model-1 follows S- shaped learning curve when learning effect applied in each consecutive planning horizon. It is being cleared from Figure 3 (a), (b), (c) which the percentage of order quantity is increasing by reducing the deterioration rate with learning effect in each shipment in all the three examples.

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OPTIMUM RESULTS OF MODEL- 2

$\tilde{D}_0 = (400,450,550,600) \text{ and } \tilde{R} = (0.13,0.14,0.16,0.17)$;

Example – 1; $(\mu = t_1 - 0.7425)$: $t_1^* = (1.1303,1.0918,0.8482,0.8203)$, $Q^* = (345.84,362.46,112.48,90.88)$, $E(TC_2(t_2^*))^* = (8565.98,8825.29,8040.01,8086.90)$. $P(t_2^*) = 0.9718$, $P(Q^*) = 232.60$, $P(E(TC_2(t_2^*))^*) = 8397.25$.

Example – 2; $(\mu = t_1 + 0.12)$: $t_1^* = (0.9733,0.9354,0.8622,0.6813)$, $Q^* = (845.63, 926.81, 1072.81, 762.04)$, $E(TC_2(t_2^*))^* = (323223.5,334679.2,350544.8,354198.8)$. $P(t_2^*) = 0.8750$, $P(Q^*) = 934.49$, $P(E(TC_2(t_2^*))^*) = 341308.40$.

Example – 3; $(\mu = t_1)$: $t_1^* = (0.3472, 0.3134, 0.2945, 0.2673)$, $Q^* = (82.48, 78.42,91.61,85.21)$, $E(TC(t_2^*))^* = (8653.25, 8909.33, 9221.58, 9294.56)$. $P(t_2^*) = 0.3051$, $P(Q^*) = 84.62$, $P(E(TC(t_2^*))^*) = 9034.94$.

CONCLUSION

In this article, we develop an inventory model for random Weibull deterioration with ramp – type demand and delay in payments under partial backlogging to determine the optimal order quantity, the minimum value of total relevant cost. All costs are taken as triangular fuzzy numbers. The effects of inflation and time value of money are also considered. Inflation and demand are also taken as crisp/trapezoidal fuzzy numbers. We present Theorem 1 and 2 to find unique solution of the total relevant cost. From the sensitivity analysis it is found that the optimal order quantity is more sensitive on the change in the parameters $E(\alpha)$, R, β, D_0, δ when $\mu < t_1$; on the change in the parameters R, D_0 when $\mu > t_1$; on the change in the parameter D_0 when $\mu = t_1$. The minimum value of total relevant cost is more sensitive on change in the parameters $E(\alpha)$, R , β, D_0, δ when $(\mu < t_1)$; δ, R, D_0 when $(\mu > t_1)$; D_0 when $(\mu = t_1)$. It helps retailer to make decisions in different replenishment policies. Optimum order quantities of model-1 and 2 in all the three examples are increased by reducing the deterioration rate with learning effects in consecutive planning horizon. Finally, the proposed model can be extended in several ways. For example, we could extend the fuzzy stochastic model to the case of multi cycle model in a planning horizone, fuzzy random planning horizon, multi-items.

APPENDIX A

1. INTERVAL ARITHMETIC:

Lemma 1. If f is a continuous interval-valued function of a real variable x in [a , b] , then there is a pair of continuous real-valued functions f_1 , f_2 such that f(x) =[$f_1(x)$, $f_2(x)$] and the integral of f is equivalent to, $\int_{[a,b]} f(x')dx' = \left[\int_{[a,b]} f_1(x')dx' + \int_{[a,b]} f_2(x'dx')\right]$

Proof. Maity and Maity [2005] proved this Lemma 1.

2. THE NEAREST INTERVAL APPROXIMATION OF A FUZZY NUMBER:

If $\tilde{A}$ is a fuzzy number with η-cut $[A_L(\eta), A_R(\eta)]$ then according to Grzegorzewsky [2008], the nearest interval approximation of $\tilde{A}$ is $\left[\int_0^1 A_L(\eta)d\eta, \int_0^1 A_R(\eta)d\eta\right]$. Therefore, middle point of the expected interval number considering $\tilde{A} = (a_1, a_2, a_3)$ as a triangular fuzzy number is $[((a_1 + a_2)/2),((a_2 + a_3)/2)]$ and sometimes its generalization, called weighted expected value, might be interesting. It is given by $[((1-q)a_1 + qa_2),((1-q)a_2 + qa_3)]$.

3. $\tilde{A} = [A_L, A_R]$, $A = w_1(A_L + A_R)/2 + w_2 A_T$, $w_1 = w_2 = 0.5$, where, $A \rightarrow \{C_0, C_0, C_h, C_s, C_L, P\}$

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DETERMINANTS OF CAPITAL STRUCTURE DECISIONS: EVIDENCE FROM ETHIOPIAN MANUFACTURING PRIVATE LIMITED COMPANIES (PLCs)

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ABSTRACT

The capital structure of a company consists of a particular combination of debt and equity issues to relieve potential pressures on its long-term financing. To examine such issues, many theories have been developed in the literature and they generally focus upon what determinants are likely to influence the so-called leverage decisions of the firms. Among these, the MM theory, trade-off theory, Information Asymmetry Theory and Agency Cost Theory have been said to mainly play a crucial role in identifying and testing the various properties of the leverage decisions. This paper examines theoretically and explores empirically the problem of the Ethiopian- Manufacturing Private Limited Companies (PLCs) capital structure decisions using firm-level panel data and with the aim of understanding which of the capital structure theories are appealing to them. That is, what determines Manufacturing Listed Companies' capital structure? To seek answers to this question, it estimates Manufacturing Private Listed Companies' leverage as a function of six explanatory variables - profitability, tangibility, size, growth, age, and non-debt tax shields - that exhibit a consistent and stable cross-sectional relationship with the leverage of corporate firms. They suggest that some of the insights from modern finance theory of capital structure are portable to Ethiopia in that certain firm-specific factors that are relevant for explaining capital structure in developed economies are also relevant in Ethiopia. Their sample included five years data from 2006/7 – 20010/11 about 33 companies. For analysis purpose descriptive statistics and pooled cross-sectional ordinary least squares (OLS) are used. The findings support the notion that Ethiopian Manufacturing Private Limited Companies' debt/equity choice do matter. The empirical results are consistent with a number of theoretical propositions typically associated with the determinants of debt-equity choice of non-financial firms. Specifically, evidence support that profitability, growth, and age establish negative relationship and the remaining three variables (tangibility, size, and tax-shield) showed positive relationship with capital structure of Ethiopian Private Limited Companies. The study has laid some groundwork upon which a more detailed evaluation of Ethiopian Private Limited Companies could be applied.

KEYWORDS
Agency Cost Theory, Determinants of Capital Structure, , Ethiopian Private Limited Companies, Pecking Order Theory, Trade-off theory.

INTRODUCTION
PERFORMANCE OF THE MANUFACTURING SECTOR
The manufacturing sector constitutes a small portion of the Ethiopian economy. In 2009/10 it contributed about 11% of the GDP, 9.5% of the total employment and 21.8 of export earnings. The sector is dominated by light manufacturing and agro-processing,   Food, beverages and tobacco are the most prominent groups in terms of gross value of production, followed in their order of significance by metal and engineering, leather and foot wear, light chemicals, non-metallic minerals, paper and printing, furniture and wood. The total value of production of the manufacturing sector in 2009/10 was about Birr 13 billion.

 The manufacturing sector is divided into two size groups: the large and medium scale industries (LMSI) which are predominantly owned by the public sector and the small scale industries (SSI) which are predominantly owned by the private sector. According to the 2003 industry surveys, there are 641 LMSI establishments accounting for about 97% of the total GVP of the manufacturing sector and 2,731 SSI establishments accounting for the remaining 3%. Of the 642 LMSI's 129 establishments are owned by the public sector while the remaining 513 belong to the private sector. Foreign investors own 7.5% of the capital of the private sector industrial establishments. The privatization process currently underway is expected to change the ownership structure in the near future. (http://www.ethiopiainvestor.com/index.phd?option=com_content&tasks -Retrieved on September 11, 2011).[54]
Manufacturing Companies are now exposed to greater opportunities than ever for expansion and diversification across the sub-sectors. Ethiopian market is growing rapidly and Ethiopian entrepreneurs are making remarkable progress in various major sub-sectors of the manufacturing industry. Despite its commendable contribution to the Nation's economy, manufacturing private limited companies (MPLCs) faces a number of problems - absence of adequate and timely banking finance, limited capital and knowledge, non-availability of suitable technology, low production capacity, ineffective marketing strategy, lack of identification of new markets, constraints on modernization & expansions, non availability of highly skilled labor at affordable cost, follow-up with various government agencies to resolve problems etc. Raising of adequate financial resources to meet diverse requirements poses the foremost hurdle for MPLCs. The important of finance in the field of small and MPLCs is fundamental as elsewhere; every problem either operation, marketing or the other is in the ultimate analysis is a "financial problem" which is a handicap in becoming more competitive in the national and international markets.
DEFINITION OF A PRIVATE LIMITED COMPANY IN ETHIOPIA
According to Article 212 of the Ethiopian commercial Code Proclamation 280/2002 (as amended), a private limited company is a company whose partners are liable only to the extent of their contributions. The maximum number of the partners is fifty while the minimum is two. The company shall not issue transferable securities. A private limited company shall not undertake banking, insurance, or any business of similar nature.
The company has a minimum share capital of Birr 15,000 which must be paid up on registration. The capital contributed by the partners may include in kind contribution which is subject to valuation. The registered capital is divided into shares. Shares may be transferred among shareholders as provided in the memorandum of association, but they can be traded with third parties only after seeking the approval of shareholders owning at least three quarter of the capital. The company may have one or more managers. They must be individuals appointed by the shareholders, but they need not be shareholders. Although the memorandum of association may provide limitations on a manger's power, these limitations are not binding on third parties.
The appointment of auditors is compulsory if the number of shareholders exceeds twenty.

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The name of the private limited company may contain a disclosure of the nature of its activity and must include the words "private limited company". The firm-name and the amount of capital of the company shall appear on all of the company documents, invoices, publications and other papers. Nowadays, most of the companies established in Ethiopia by foreign or domestic investors are private limited companies. For more information on forms of business organizations and their establishment, refer to the Commercial Code of Ethiopia (1960).[13]

BACKGROUND OF THE STUDY

In one way or another, business activity must be financed. Without finance to support fixed assets and working capital requirements, business could not exist. There are three primary sources of finance for companies:

- Cash surplus from operating activities
- New equity funding.
- Borrowing from bank and non-bank sources. Non-bank sources are mainly investors in capital markets who subscribe for bonds and other securities issued by companies.

By taking into account a company's particular circumstances, management should decide what is the most appropriate mix of internal and external funding, and of equity and debt, i.e., how the company should structure the necessary capital to finance its activities.

This study is important since it works on the following issues:

- Deciding the optimal capital structure for a company, over short-term and long-term planning periods.
- Ensuring that funds are always available to meet loan repayment obligations, and that refinancing would be available if required.
- Helping the Private Companies of Ethiopia to determine the appropriate mix of debt and equity in order to maximize its value and minimize its costs.

Firms included in this sample are all those ones listed on Ethiopian Revenue and Customs Authorities (ERCA) Head Office Addis Ababa, Ethiopia. The firms are selected using convenience sampling. There are about 97 MPLCs listed on ERCA. But, we have included only 33 firms in our sample study, covering the period of five years from 2006/7 – 20010/11.

REVIEW OF RELATED LITERATURE

CAPITAL STRUCTURE THEORIES

Capital structure theories developed since the original Modigliani and Miller (1958)[37] propositions may be broadly classified in three types; namely static trade-off theory, agency theory and theories based on information asymmetries (pecking order theory). Whilst these theories were developed in the field of corporate finance, they have been profitably employed in private limited companies studies.

TRADE-OFF THEORY

DeAngelo and Masulis (1980)[15] subsequently proposed the static trade-off theory (TOT), whereby the advantage conferred by debt in the form of a decreased tax bill was offset by an increase in business risk. They proposed a theoretical optimum level of debt for a firm, where the present value of tax savings due to further borrowing is just offset by increases in the present value of costs of distress.

In view of this theory, issuing equity means moving away from the optimum and should therefore be considered as bad news. According to Myers (1984)[41], firms adopting this theory could be regarded as setting a target debt-to-value ratio with a gradual attempt to achieve it. Myers, however, suggests that managers will be reluctant to issue equity if they feel it the firm is undervalued in the market. The consequence is that investors perceive equity issues to only occur if equity is either fairly priced or overpriced. As a result investors tend to react negatively to an equity issue and management is reluctant to issue equity. Empirical investigations of the trade-off theory in the PLC literature do not find evidence to support this theory (Michaelas et al., 1999[36], Sogorb Mira, 2005[48]).

PECKING ORDER (INFORMATION ASYMMETRY) THEORY

Myers (1984)[41] and Myers and Majluf (1984)[39] developed the pecking order theory (POT) based on the premise that 'inside' management are better informed of the true value of the firm than 'outside' investors. These information asymmetries result in varying costs of additional external finance, as potential investors perceive equity to be riskier than debt. They propose that firms seek to overcome problems of undervaluation arising from information asymmetries, preferring to finance investment projects with internal funds in the first instance. When internal equity is exhausted, firms use debt financing before resorting to external equity. Authors state that the POT is even more relevant for the PLC sector because of the relatively greater information asymmetries and the higher cost of external equity for PLCs (Ibbotson et al., 2001)[28]. Additionally, a common phenomenon in the sector is the desire of firm owners to retain control of the firm and maintain managerial independence (Chittenden et al., 1996[12], Jordan et al., 1998[30]). These factors suggests that PLC owners source their capital from a pecking order of, first, their "own" money (personal savings and retained earnings); second, short-term borrowings; third, longer term debt; and, least preferred of all, from the introduction of new equity investors, which represents the maximum intrusion (Cosh and Hughes, 1994)[14]. Empirical evidence supports the applicability of the POT in explaining the financing of PLCs (Chittenden et al., 1996[12], Michaelas et al., 1999[36], Berggren et al., 2000[6], Lopez-Gracia and Aybar-Arias, 2000[34], Sogorb Mira, 2005[48], Ou and Haynes, 2006[42]). These studies emphasize that small firms rely on internal sources of finance and external borrowing to finance operations and growth, and only a very small number of firms use external equity. A number of studies report that firms operate under a *constrained* pecking order, and do not even consider raising external equity (Holmes and Kent, 1991[25], Howorth, 2001[26]).

AGENCY COST THEORY

- Jensen and Meckling (1976)[29] outlined a number of potentially costly principal-agent relationships in publicly quoted corporations that may arise because the agent does not always conduct business in a way that is consistent with the best interest of the principals. The firm's security holders (debt-holders and stockholders) are seen as principals and the firm's management as the agent, managing the principals' assets. Whilst a number of these relationships are relevant for PLCs, the primary agency conflict in PLCs is generally not between owners and managers, but between inside and outside contributors of capital (Hand et al., 1982)[22]. Potential agency problems in PLCs are exacerbated by information asymmetries resulting from the lack of uniform, publicly available detailed accounting information. The primary concern for outside contributors of capital arises from moral hazard, or the possibility of the PLC owner changing his behavior to the detriment of the capital provider after credit has been granted. This is because the firm owner has an incentive to alter his behavior *ex post* to favor projects with higher returns and greater risk. Debt providers seek to minimize agency costs arising from these relationships by employing a number of lending techniques (Baas and Schrooten 2006)[4]. The pervasiveness of the use of collateral is confirmed by a number of empirical studies, for example; Black et al. (1996)[8] find that the ratio of loan size to collateral exceeds unity for 85 percent of PLCs loans in the UK; Berger and Udell (1990)[5] report that over 70 percent of all loans to PLCs are collateralized. Even for firms with positive cash flow financial institutions typically require collateral (Manove et al., 2001)[35].

DETERMINANTS OF CAPITAL STRUCTURE

Both theoretical and empirical capital structure studies have generated many results in an attempt to explain the determinants of capital structure. As a result of these studies, some broad categories of capital structure determinants have emerged. The main determinants of capital structure tested include profitability, size, growth opportunity, tangibility, age and tax shield effects. Titman and Wessels (1988)[50], and Harris and Raviv (1991)[23], however, point out that the choice of suitable explanatory variables is potentially controversial.

PROFITABILITY

There are no consistent theoretical predictions on the effects of profitability on leverage. From the point of view of the trade-off theory, more profitable companies should have higher leverage because they have more income to shield from taxes. The free cash flow theory would suggest that more profitable companies should use more debt in order to discipline managers, to induce them to pay out cash instead of spending money on inefficient projects. However, from the point of view of the pecking-order theory, firms prefer internal financing to external. So, more profitable companies have a lover need for external financing and therefore should have lover leverage. Most empirical studies observe a negative relationship between leverage and profitability, for example the work of (Rajan and Zingales, 1995)[46], (Huang and Song, 2002)[27], (Booth et al., 2001)[9], (Titman and Wessels, 1988)[50], (Friend and Lang, 1988)[19] and (Kester, 1986)[32].

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SIZE

From the theoretical point of view, the effect of size on leverage is ambiguous. As Rajan and Zingales (1995, p.1451)[46] claim: "Larger firms tend to be more diversified and fail less often, so size (computed as the logarithm of net sales) may be an inverse proxy for the probability of bankruptcy. If so, size should have a positive impact on the supply debt. However, size may also be a proxy for the information outside investors have, which should increase their preference for equity relative to debt."

Also empirical studies do not provide us with clear information. Some authors find a positive relation between size and leverage, for example Huang and Song (2002)[27], and Rajan and Zingales (1995)[46], and (Friend and Lang, 1988)[19]. On the other hand, some studies report a negative relation, for example (Kester, 1986)[32], (Kim-Sorensen, 1986)[33] and (Titman and Wessels, 1988)[50]. Moreover, the results are very often weak as far as the level of statistical significance is concerned.

GROWTH OPPORTUNITIES

According to Myers (1977)[40], firms with high future growth opportunities should use more equity financing, because a higher leveraged company is more likely to pass up profitable investment opportunities. As Huang and Song (2002, p.9)[27] claim: "Such an investment effectively transfers wealth from stockholders to debtholders". Therefore a negative relation between growth opportunities and leverage is predicted. As market-to-book ratio is used in order to proxy for growth opportunities, there is one more reason to expect a negative relation – as Rajan and Zingales (1995, p. 1455)[46] point out: "Theory predicts that firms with high market-to-book ratios have higher costs of financial distress, which is why we expect a negative correlation."

Some empirical studies confirm the theoretical prediction, such as (Rajan and Zingales, 1995)[46], (Kim and Sorensen, 1986)[33] or (Titman and Wessels, 1988)[50] reports. However, for example, Kester (1986)[32] and Huang and Song (2002)[27] demonstrate a positive relation between growth opportunities and leverage.

TANGIBILITY

It is assumed, from the theoretical point of view, that tangible assets can be used as collateral. Therefore higher tangibility lowers the risk of a creditor and increases the value of the assets in the case of bankruptcy. As Booth et al. (2001, p.101)[9] states: "The more tangible the firm's assets, the greater its ability to issue secured debt and less information revealed about future profits." Thus a positive relation between tangibility and leverage is predicted.

Several empirical studies confirm this suggestion, such as Rajan and Zingales, (1995)[46], and Titman and Wessels, (1988)[50] find. On the other hand for example Booth et al., (2001)[9] and Huang and Song, (2002)[27] experience a negative relation between tangibility and leverage.

AGE OF THE FIRM

Age of the firm is a standard measure of reputation in capital structure models. As a firm continues longer in business, it establishes itself as an ongoing business and therefore increases its capacity to take on more debt; hence age is positively related to debt. Before granting a long, banks tend to evaluate the credit worthiness of firms as these are generally believed to pin high hopes on very risky projects promising high profitability rates. In particular, when it comes to highly indebted companies, they are essentially gambling their creditor's money. If the investment is profitable, shareholders will collect a significant share of the earnings, but if the project fails, then the creditors have to bear the consequences (Myers, 1977).[40] Hall et al. (2004)[21] agreed that age is positively related to long-term debt but negatively related to short-term debt. Esperanca et al. (2003)[17], however, found that age is negatively related to both long-term and short-term debt.

NON-DEBT TAX SHIELDS

Other items apart from interest expenses, which contribute to a decrease in tax payments, are labeled as non-debt tax shields (for example the tax deduction for depreciation). According to Angelo and DeMasulis (1980, p.21)[15]: "Ceteris paribus, decreases in allowable investment related tax shields (e.g., depreciation deductions or investment tax credits) due to changes in the corporate tax code or due to changes in inflation which reduce the real value of tax shields will increase the amount of debt that firms employ. In cross-sectional analysis, firms with lower investment related tax shields (hol-ding before-tax earnings constant) will employ greater debt in their capital structures." So they argue that non-debt tax shields are substitutes for a debt-related tax shield and therefore the relation between non-debt tax shields and leverage should be negative.

Some empirical studies confirm the theoretical prediction, for example Kim and Sorensen (1986, p.140)[33] declare: "DEPR has a significantly negative coefficient. This is consistent with the notion that depreciation is an effective tax shield, and thus offsets the tax shield benefits of leverage." A negative relation between non-debt tax shields and leverage is also found by (Huang and Song, 2002)[27] and (Titman-Wessels, 1988)[50]. However, for example Bradley et al. (1984)[10] observe a positive relationship between non-debt tax shields and leverage.

EMPIRICAL STUDIES

Allan J. Taub (1975)[1], attempted to examine the factors influencing the firm's choice of a debt-equity ratio. He dealt explicitly with the relationship between overall debt equity ratio of the firm and its choice of new financing.

The variables were:

a)   The difference between the expected future return on firm's capital and pure rate of interest

b)   The uncertainty of the future earning of the firm

c)   The size of the firm

d)   Tax rate, and

e)   Firm's period of solvency, and the debt equity ratio as dependent variable.

He investigated the relationship between variables for a total of 89 randomly chosen firms, for ten years. The ten year observations were from 1960 – 1969. Two statistics were used: the likelihood –ratio and t – test. The empirical results show that differences between return to the firm and long term rate of interest and size had a positive influence on debt equity ratio. Results for the remaining variables were less than satisfactory.

Fakher, et al. (2005)[18], provided evidence of capital structure theories pertaining to developed countries and examined capital structure with reference the Libyan business environment. The dependent variable was leverage ratio and the independent variables were size, tangibility, growth, opportunities and profitability. Their samples include five year data from 1995 – 1999 about 55 companies. The companies selected as a sample were from both public and private sectors. To test the relationships between the level of debt and their explanatory variables they used ordinary least square regressions. The results indicated that private companies tended to have a higher average growth rate and tangible assets than public ones. The private companies had higher levels of short-term debt than public companies, meaning that private companies had higher average debt ratios than the public ones. The level of long term debt was very similar for both private and public companies. The tangibility and growth variables had a positive correlation with short term debt, and a negative correlation with long term debt. Profitability and size had a negative correlation with short term and total debt ratios. This implies that growing companies and companies with higher levels of tangible assets tend to use short term debt rather than long term and large and profitable companies tend to use less debt overall.

Over the past 50 years, much of the capital structure research has advanced theoretical models to explain the capital structure pattern and also to provide empirical evidence concerning whether the theoretical models have explanatory power when applied to the real business world. The focus of both academic research and practical financial analysis has been on those large corporations with publicly traded debt and equity securities that dominate economic life throughout the developed world.

Despite some significant contributions to the general perception of the various intricacies about corporate capital structure, research produced so far did not provide yet a sound basis for establishing in a decisive fashion, the empirical validity of the different theoretical models. Probably the most electric, prevalent and non-controversial view, with respect to the contention surrounding the corporate capital structure theory, is Myer's argument that it is a *puzzle,* mirrored by Kamath (1997)[31] *enigma*, Stiglitz (1989)[49] *dilemma*, or, as suggested in The Economist (January 6th, 1996, p.61), a *mystery*. It appears that (1) we are still lacking a comprehensive theory to explain how firms decide about their strategic financing; and (2) yet we cannot unambiguously specify the relation between capital structure choice and firm value.

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Theoretical discourse on the capital structure of the firm originates from the irrelevance propositions of Modigliani and Miller (1958)[37], stating that the capital structure of the firm was independent of its cost of capital, and therefore of firm value. The propositions of 1958 were based on a number of unrealistic assumptions, and in 1963 Modigliani and Miller[38] introduced taxes into the model. This led to the development of the trade-off theory of capital structure, whereby the tax-related benefits of debt were offset by costs of financial distress. Alternative approaches, based on asymmetric information between 'inside' managers and 'outside' investors, include signaling theory (Ross, 1977)[47] and the pecking order theory (Myers, 1984[41], Myers and Majluf, 1984[39]). The latter postulates that when internal sources of finance are not sufficient for investment needs the firm has a preference to raise external finance in debt markets, with equity issues the least preferable source. A further approach considered a nexus of relationships, characterized as principal-agent relationships, and the potential agency costs on the firm (Jensen and Meckling, 1976)[29].

While the majority of the research results has been derived from the experiences of the developed economies that have many institutional similarities (Hodder and Senbet, 1990[24]; Rajan and Zingales, 1995[46], Wald, 1999[52]; Ozkan.2001[43]; Bevan and Danbolt, 2002[7]), little work has been done to further our knowledge on capital structure within developing countries that have different institutional structures.

Booth et al. (2001)[9] provided the first empirical study to test the explanatory power of capital structure models in developing countries. It investigated whether they had more general applicability. The results were somewhat skeptical of these premises. They provide evidence that firms' capital choice decisions in developing countries were affected by the same variables as they were in developed countries. Nevertheless, there were persistent differences of institutional structure across countries indicating that specific country factors were at work. Their findings suggest that although some of the insights form modern finance theories are portable across counties, much remains to be done to understand their impact of different institutional features on capital structure choices.

In this paper we investigate the applicability of theories of capital structure in a sample of 33" Manufacturing Private Limited Companies" in Ethiopia pertaining to developing country by empirically testing the effect of firm characteristics on sources of debt and equity employed and examines the impact of the lack of the secondary capital market. By comparing the capital structures of selected manufacturing PLCs, this study is relevant in the Ethiopian context given the important role the manufacturing industry is expected to pay as the engine of growth in a newly developing economy. Since this is the first examination of its type in Ethiopia manufacturing firms, the aim of this study is to develop some preliminary groundwork that a more detailed evaluation could be based. It is hoped to answer the question whether, and how closely, does the determinants of Ethiopian capital structure support the finance theory?

More specifically:
1. Would capital structure managerial decision making provide empirical support for extant theories?
2. Which are the potential determinants of debt/equity managerial policies in Ethiopian manufacturing PLCs?
3. Can we uncover the same patterns for manufacturing PLCs that have been identified for non-finance firms?

Therefore, this paper fills the stated gap by identifying the factors that determine capital structure decision and providing additional facts to the theory of capital structure relevancy evidencing Manufacturing Firms in Ethiopia.

The remainder of the paper is organized as follows: section two provides a review of related literature on capital structure. The study design, data source and collection, sampling design, methods of data analysis, variables, hypotheses, and model specification are described in section three and section four presents the discussion and empirical results. Section five concludes the discussion and provides some recommendations on research implication.

METHODOLOGY OF THE STUDY

STUDY DESIGN
This study is an explanatory research following a quantitative approach with a study design of case study finding evidence for capital structure determinants in Private Limited Companies (PLCs) in Ethiopia.

DATA SOURCE AND COLLECTION METHODS
The source for the data is entirely from secondary sources i.e., data is collected from the Audited financial statements: Balance Sheets and Income statements - submitted to Ethiopian Revenues and customs Authority at Addis Ababa head office for tax purpose. This is done in an attempt to avoid the risk of distortion in the quality of data that could be obtained directly from the respective company's archives and due to the operational location differences in the companies under investigation.

The criteria for inclusion in the sample will be holding 5 years data from 2006/7-2010/11. The data is obtained and used in the study as a basis for analysis by merging all companies' balance sheet and income statement information during the study period.

SAMPLING DESIGN
The sample frame employed for this study is ERCA list of firms. These firms are classified as having at least capital investment of between 2006/7 to 2010/11 Year. The list was substantially refined and modified to obtain a list of firms consistent with the aims of the study and within the parameters the Ethiopia definition of a PLC. Financial firms were left out, as their capital structure may be determined by Commercial Bank of Ethiopia (CBE) requirements. An advantage of this sampling frame is that it is not confined to particular sectors or geographical area, although it is not representative of the total Ethiopia PLC population in the strictest sense, because eligible firms representing a sample size of 31.96 percent surviving firms.

The study takes a sample size of 33 PLCs. The companies selected as a sample were from both public and private sectors. A stratified sampling design is followed where sample from each stratum is selected using convenient sampling technique. The constructed data set results in a panel database of 165 cases for 33 companies.

The first criteria used in selecting sample units to be included in the study are holding a complete five years financial statement data. The researchers then made two stage restriction criteria to arrive at a definite study population. Firstly, firms belonging to bank, insurance or other financial industries are deliberately excluded from the analysis because their capital structure is considerably controlled by National Bank of Ethiopia (NBE). Subsequently, the researcher made the second level sample restriction that firms with missing financial data for a period covering six years from 2006/7-2010/11 are also excluded from the study in order to examine the trend of firms financing decision. The data pertinent to year 2005/6 is used only to compute the variable growth for the year 2006/7 of all observation, i.e. percentage change in total asset. After the researchers investigate the financial statement of 97 manufacturing Private Limited Companies from PLCs taxpayers' Head Office in Addis Ababa, only 31 firms (see Appendix A – Table 6) that satisfy the above criterion were included in the sample study.

METHOD OF DATA ANALYSIS
To test the hypothesis, the relationships between the level of debt and eight explanatory variables representing profitability, size, growth, tangibility, age and non-debt tax shields.

STATA SE 10 software application will be used and a test of model accuracy is made. The above six independent variables are regressed against dependent variable as expressed in Long-Term Debt Ratio. Descriptive statistical tools such as mean and standard deviations were applied to describe relevant information about each variable. In addition the correlation analysis was employed to measure the degree of relationship between two variables.

VARIABLES, HYPOTHESES AND MODEL SPECIFICATION
In order to analyze the determinants of capital structure in Ethiopian Manufacturing Private Limited Companies, the selection of dependent and independent variables is primarily guided by the result of the previous empirical studies and the availability of data. Thus, the following seven key variables were identified: leverage, profitability, size, growth, tangibility, age, and non-debt tax shield.

DEPENDENT VARIABLE
The dependent variable used in this study is leverage. Leverage can be measured by using different financial ratios. However, as per the definition of capital structure, which is the mix of long term sources of finance, the leverage variable used in this study measured as the ratio of long-term debt to total assets.

INDEPENDENT VARIABLES
The independent variables include profitability, size, growth, tangibility, age, and non-debt tax shield. The entire variable for this study is based on book value in line with the argument by Myers (1984)[41] that book values are proxies for the value of assets in place.

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DESCRIPTION OF VARIABLES

A key issue in testing which factors are associated with leverage has been to examine whether book leverage (debt divided by total assets) or market leverage (debt divided by the sum of book debt plus the market value of equity) should be used.

TABLE 3.1: DESCRIPTION OF VARIABLES

No.	VARIABLE	
	Dependent	Description
1	Leverage =Long term Debt Ratio	Long Term Debt/Total Asset
No.	Independent	Description
1	Profitability	Operating Income/Total Sales
2	Size	Natural Logarithm Of Total Asset
3	Growth	Percentage Change In Total Assets
4	Tangibility	Fixed Assets / Total Asset
5	Age	Number of Years
6	Non-Debt Tax Shields	Depreciation Expense /Total Assets

Source: Mathematical and financial formula.

Early empirical work tended to focus on book leverage. Myers (1977)[40] argued that managers focus on book leverage because debt is better supported by assets in place than it is by growth opportunities. Book leverage is also preferred because financial markets fluctuate a great deal and managers are said to believe that market leverage numbers are unreliable as a guide to corporate financial policy. Taking the above arguments as a springboard, the dependent and independent variables depicted on Table 3.1 above are scaled by book value measures.

HYPOTHESES FORMULATED

Consistent with the extant literature, the following six hypotheses were developed to test the relationship between the level of leverage and the independent variables.

(1). Profitability

In relation with Manufacturing Private Limited Companies (MPLCs) in Ethiopia, the following hypotheses are formulated based on rationale below.

If earning distributions are taxed at the personal level, there will be a tax advantage associated with retaining equity that lead more profitable firms to reduce their debt ratios. Another argument for a negative relation between profitability and leverage is that, firms with market power prefer keeping their leverage at low levels to deter or discourage potential entrants into their lines of business.

Hypothesis 1: There is negative relationship between profitability and leverage of a firm

(2). Size

In connection with PLCs in Ethiopia, the following hypothesis is formulated based on the following rational. Size is likely to be positively correlated with leverage, since direct bankruptcy costs appear to constitute a larger proportion of a firm's value as that value decreases. It is also the case that relatively large firms in tend to be more diversified, have greater access to debt markets and less prone to bankruptcy therefore there is a tendency of being more leveraged as size increases.

Hypothesis 2: There is strong positive relationship between size and leverage of a firm.

(3). Growth

In connection with manufacturing PLCs in Ethiopia, the following hypothesis is formulated based on rational below.

Growing companies' funding pressures for investment opportunities is likely to exceed their retained earnings (funds generated inside the firm) and according to the pecking order theory growing companies are likely to choose debt rather than equity.

Hypothesis 3: There is significant negative relationship between growth and leverage of a firm.

(4). Tangibility

The value of tangible assets is associated with higher debt capacity. Myers (1984)[41] suggests that issuing debt secured by collateral may reduce the asymmetric information related costs in financing. Hence, debt secured by collateral may mitigate asymmetric information related cost in financing. Therefore, a positive relationship between tangibility and financial leverage may be expected. In alliance with manufacturing PLCs in Ethiopia, the following hypothesis is formulated based on the rational stated above.

Hypothesis 4: There is positive relationship between tangible assets and leverage of a firm

(5). Age

In connection with manufacturing PLCs in Ethiopia, the following hypothesis is formulated based on the rational below.

As firms became aged, the long years of track record will enable them to easily convince creditors and also will expertise in finding alternative credit source cost effectively or in favorable terms while going for debt capital. This induces a positive relationship between leverage ratios and age of the firm.

Hypothesis 5: There is a positive relationship between leverage ratios and age.

(6). Non-debt tax shields

Tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing. As a result, firms with large non-debt tax shields relative to their expected cash flow include less debt in their capital structures. In association with manufacturing PLCs in Ethiopia, the following hypothesis is formulated based on the rational stated above.

Hypothesis 6: There is a negative relationship between leverage ratios and NDTS.

MODEL SPECIFICATION

The hypotheses formulated in section III-5 above were empirically tested using multivariate ordinary least square (OLS) regression model, employing long-term debt (leverage) and firm characteristics as dependent and independent variables respectively. The model tested for each of the six independent variables in the selected manufacturing PLCs in Ethiopia is represented by:

Leverage = Function of (Profitability, Size, Growth, Tangibility, Age, Non-debt Tax-shield) ----------------------------- eq. 1

Consequently, the specified model appears as follows:

Leverage = $\beta_0 + \beta_1[PROF] + \beta_2[SIZE] + \beta_3[GROW] + \beta_4[TANG] + \beta_5[AGE] + \beta_6[NDTS] + ei$ -------------------------------- eq. 2

Where:

- β_1 = Coefficient of Intercept
- β_2 = Coefficient of Profitability,
- β_3 = Coefficient of Size,
- β_4 = Coefficient of Growth,
- β_5 = Coefficient of Tangibility,
- β_6 = Coefficient of Age, and
- β_7 = Coefficient of Non-debt tax shields,
- ei=The Error Term

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DISCUSSIONS AND FINDINGS

DESCRIPTIVE STATISTICS

Table 3.2 depicts the descriptive statistics of the sample firms including the number of observations; mean distribution, standard deviation, minimum and maximum values of leverage and six explanatory variables for 33 sample manufacturing PLCs for the study period of 2006/7-2010/11.

TABLE 3.2 DESCRIPTIVE STATISTICS OF STUDY VARIABLES

Variable	Obs	Mean	Std. Dev.	Min	Max
LEV	165	0.139989	0.202401	0.279	0.597
PROF	165	0.256149	0.654173	0.313	0.724
SIZE	165	15.3217	1.834576	12.81764	18612
GROW	165	0.135891	0.249289	0.018	0.682
TANG	165	0.523431	1.168673	.357	.724
AGE	165	13.142861	9.324411	11	35
NDTS	165	0.082894	0.84039	0.0256	0.358

Source: STATA output from financial statements of sample companies, 2006/7-2010/11

An appraisal of Table 3.2 above exhibits several facts. In the first place, the average leverage proportion in financing the total asset of manufacturing PLCs in Ethiopia is 13.99%. Which means 86.01% of the total asset invested is left as a buffer being from short-term debt and equity claim. In other words, 13.99 per cent of each Birr 1 asset in the balance sheet is obtained from leverage. The standard deviation 20.24% indicates a wide variation in leverage ratio among sample companies. The minimum and the maximum value of leverage ratio are 27.9% and 59.7% respectively.

The average profitability of firms included in the study, when measured in terms of return on assets (ROA), the ratio of operating income (EBIT) to total asset, accounted for 25.61% per annum. The standard deviation 65.42% indicates the existence of large variation in the profitability among the sampled firms. The maximum attainable average profit is 72.4% where as the lowest record average profitability rate is 31.3%.

The average size, the mean of the natural logarithm of total assets (Size) over the study period indicates that the average manufacturing PLCs in Ethiopia was approximately Birr 12,245,780 in terms of asset holding, ranging from Birr 850,962 minimum value to a Birr 1,145,818,270 maximum value.

The growth of assets over the five years study period has recorded an average rate of approximately 13.58% where all the companies score in between positive growth or asset acceleration of 1.08% and a highest growth score of 68.2%.

The fixed asset to total asset ratio (tangibility) of the sample organizations ranges from 35.7% to 72.4%. The mean fixed asset to total asset ratio of 52.34% is the reflection of the fact that, manufacturing PLCs in Ethiopia relatively invest evenly on fixed and current assets at a rate of 52.34% and 47.66% respectively with a slight inclination to investing more on current asset.

Table 3.4 also showed that the firms included in the study have an age distribution between 11 years and 35 years time span and the mean age is approximated as 13 years. This result can be disclosed as; the largest track record of operation is 35 years while the least achieved track record among the sample firms is 11 years of operating experience.

As far as the non-debt tax shield is concerned, the average tax shields enjoyed by manufacturing PLCs in Ethiopia from sources other than interest are found to be 9.29% of the total assets invested. The ceiling of the non-debts tax shields are 35.8% of the total assets and the lowest coverage on the other hand is 2.56% of the total assets.

REGRESSION ANALYSIS

We ran cross-sectional ordinary least squares (OLS) regressions using data provided by the financial statements covering a period of five years from 2006/7 to 2010/11. We investigate the influence of the independent variables on the financing decision by estimating a regression equation and examining how the observed relationships change in the model estimates. Results of the OLS regression analyses are statistically significant for all six dependent variables, and are presented in Table 3.4.

Correlation among independent variables may pose problems in interpreting regression coefficients. This is not a problem of model specification, but of data (Hair et al., 2006)[20]. Pearson product moment coefficients presented in Table 3.3 indicate the magnitude and direction of the association between the independent variables. A number of independent variables are correlated at the 0.01 level of significance, and in these instances we reject the null hypothesis that there is no association between the variables. The moderate magnitude of the correlations does not suggest a high degree of first-order collinearity among the independent variables.

TABLE 3.3: PEARSON CORRELATION COEFFICIENTS

	PROF	SIZE	GROW	TANG	AGE	NDTS
PROF	1.000					
SIZE	0.268*	1.000				
GROW	0.380*	-0.378*	1.000			
TANG	-0.377*	0.079	-0.246*	1.000		
AGE	0.195*	0.234*	0.211*	0.057	1.000	
NDTS	-0.158*	-0.161	0.056	0.034	-0.221*	1.000

Source: STATA data summary statistics result

Note: *Correlation is statistically significant at the 99% level of confidence (2-tailed)

Although the magnitude of correlation coefficients is moderate, a lack of high correlation values does not ensure absence of collinearity, as the combined effect of two or more independent variables may cause multicollinearity. The conventional measures for multicollinearity are tolerance and the variance inflation factor (VIF). The tolerance value is the amount of an independent variable's predictive ability that is not predicted by the other independent variables in the equation (Hair et al, 2006)[20]. A tolerance value of 1.00 indicates that a variable is totally unaffected by other independent variables. Theoretically, a VIF greater than 10 may suggest that the concerned variable is multicollinear with others in the model and may need to be excluded from the model.

Analysis of the tolerance values and VIFs in Table 3.4 below indicates that multicollinearity does not pose a problem. Results of the OLS regression analyses are statistically significant for all six dependent variables.

Brief discussions of the summary regression results show that the statistically significant negative relationship between profitability of the firm and leverage reflects the importance of equity in funding firms with low turnover. Additionally, grow and age are significantly negatively related with leverage, suggesting that firms with more growth opportunities will have less debt as there is less need for the disciplining role of debt. Age which is negatively correlated with leverage suggests that the older the firm is, the more time it has to build up its internal resources from profitable trading. The results also show that size, tangibility and non-debt tax shield have positive correlation with leverage. Therefore, the selected independent variables can explain the dependent variable with considerable degree.

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TABLE 3.4: ESTIMATED ORDINARY LEAST SQUARES REGRESSION COEFFICIENTS

	Debt		Collinearity Statistics	
	LTD	Tolerance	VIF	
Independent Variables	Model β			
PROF	-0.758*** (-1.80)	0.832	1.68	
SIZE	0.416* (1.67)	0.726	1.37	
GROW	-0.610** (-.076)	0.695	1.38	
TANG	0.408 (0.346)	0.714	1.52	
AGE	-0.324 (0.220)	0.638	1.21	
NDTS	0.265* (-5.19)	0.854	1.15	
Constant	.038 (.490)			
Adjusted R^2	61.2			
"F" Value	5.4			
Significance of "F"	.000			

Source: STATA data summary statistics result

Note: t statistics in parentheses. ***, **, * statistically significant at the 99%, 95% and 90% level of confidence respectively

The overall explanatory power of the model, as can be vividly seen on Table 3.4 from the R square value, is 61.2%. This is an indication that 61.2% of the change in leverage is successfully explained by the selected firm specific factors (profitability, size, growth, tangibility, age, and non-debt tax shield) or independent variables included in the model. However, the remaining 38.8% changes in leverage are caused by other factors that are not included in the model.

HYPOTHESIS TESTING EMPIRICAL RESULTS

Hypothesis testing is conducted on the basis of the relationship of dependent variable leverage and independent variables (the above discussed regression results) with reference to previous empirical studies and the three capital structure theories namely trade-off theory, pecking order theory and agency cost theory. A comparison of the direction in both hypothesized and actual relationships between dependent and independent variables is presented in Table 3.5.

TABLE 3.5: PREDICTED, THEORETICAL AND ACTUAL SIGN OF THE COEFFICIENT OF INDEPENDENT VARIABLES

Independent Variables	Definition	Predicted Sign	Theoretical signs of independent variables based on capital structure theories			Actual Sign
			TOT	POT	ACT	
Profitability	Ratio of operating income to total asset	-	+	-	?	-
Size	Natural logarithm of total assets	+	+	+	+	+
Growth	Percentage increase in total assets	-	-	+	-	-
Tangibility	Ratio of fixed assets to total assets	+	+	+	+	+
Age	Number of years stay in the business	+	+	-	?	-
Non-Debts Tax Shields	Ratio of depreciation to total assets	-	-/+	?	?	+

Source: STATA regression result based on the financial statements of sample companies, 2006/7-2010/11, & capital structure theories.

NOTES:
- "TOT" indicate Trade-Off Theory, "POT" signify Pecking-Order Theory and "ACT denotes Agency Cost Theory
- "+" indicate that a positive relationship between the independent variable and leverage
- "-" indicate that a negative relationship between the independent variable and leverage
- "?" indicate that the available literature does not indicate a clear outcome for the relationship

The first research hypothesis was postulated in order to assess the relationship between profitability and leverage of a firm based on pecking-order theory on the grounds that there is significant negative relationship between profitability and leverage. In conformity with the hypothesis the actual sign of the coefficient of profitability variable are negatively and strongly relate with leverage at 1%level of significance. This fact provide empirical support for the first hypothesis and provide evidence that, citrus paribus the more the share companies generate profit the less they uses leverage in financing their fund requirement. They prefer internal financing to external debt securities and vice versa. This result is consistent with the findings made by Titman and Wessels (1988)[50], Rajan and Zingales (1995)[46] and Bevan and Danbolt (2002)[7] in developed countries, Booth *et al*, (2001)[9], Pandy (2001)[44], Wiwattanakantang (1999)[53] and Chen (2004)[11] in developing countries.

The second research hypothesis formulated related to financing decision was that there is significant positive relationship between leverage and size of a company based on the combined prediction of trade-off, pecking-order and agency cost theory. In agreement to the hypothesis, Table 3.3 of regression result exhibits statistical evidence that the size is positively related to leverage of large taxpayer manufacturing PLCs in Ethiopia at 10% level of significance. Thus, hypothesis two is accepted. This finding suggests that large firms have the capacity to employ more debt on their capital structure than equity related securities, perhaps because they can hold a greater bargaining power towards creditors. The finding of Wiwattanakantang (1999)[53], Al-Sakran (2001)[2], Pandy (2001)[44], Booth *et al*, (2001)[9], and Huang and Song (2002)[27] shows a significant positive relationship between leverage ratio and size of a firm in developing countries.

Research hypothesis third predicted that significant negative relationship exists between growth and leverage. In agreement with the research hypothesis, the regression result in Table 3.4 exhibit negative relationship between growth and leverage as suggested by trade-off theory and agency cost theory. Even though the beta coefficient shows the hypothesized theoretical relation between growth and leverage ratio, this is statistically insignificant. This can be interpreted as growth variable does not explain the variation in the leverage ratio and is found to be insignificant factor to decide the capital structure of manufacturing PLCs in Ethiopia.

A significant positive relation between tangibility and leverage of a firm was observed in Table 3.4 of regression result for the tangibility variable. It gives a balanced evidence for the fourth research hypothesis and three arenas of capital structure theories since all the theories expect a positive relation between leverage and tangibility. This indicates that firms with more tangible assets have a greater ability to secure debt and collateral value is found to be the major determinant of the level of debt financing for manufacturing PLCs in Ethiopia. In consistency with this study, the findings of Attaullah and Sufiullah (2007)[3] study in Pakistan, the work of Wiwattanakantang (1999)[53] in Thailand, the examination of Dilek, et al. (2009)[16] for Turkish firms, the study of Um (2001)[51] in South

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Korea, Titman and Wessels (1988)[50] and Rajan and Zingales (1995)[46] study in developed countries reveals a positive relationship between tangibility and leverage.

Research hypothesis five was postulated to estimate the relationship between age and leverage based on pecking order theory. The regression result in this study rejects the research hypothesis by providing empirical evidence that age variable significantly and negatively impact on leverage and this result is confirms with trade-off theory and the findings of Esperanca, et al. (2003)[17]. This gives a meaning that at the initial stage of operating years; share companies raise more money from debt related sources. While, as companies stay in business and get more experience they redirect their financing gears towards equity schemes.

The sixth research hypothesis was formulated in order to assess the relationship between non-debts tax shields and leverage of a firm based on trade-off theory on the premises that there is significant negative relationship between non-debts tax shields and leverage. Beta coefficient associated with non-debts tax shields appears to have a significant positive relation with firm leverage. This leads to reject the fourth hypothesis that non-debts tax shields acts as an inverse proxy for the leverage of a firm. One of the possible explanations of the sign of this effect could be that tax deduction for depreciation is not substitutes for the tax benefits of debt financing. Therefore share companies with a large non-debt tax shield are likely to be more leveraged. The positive impact of non-debt tax shield on leverage is in favor of the results of many empirical studies such as Bradly *et al*. (1984)[10] and Rafiu and Akinlolu (2008)[45] from Nigeria firms.

CONCLUSION

The capital structure of a company consists of a particular combination of debt and equity issues to relieve potential pressures on its long-term financing. To examine such issues, many theories have been developed in the literature and they generally focus upon what determinants are likely to influence the so-called leverage decisions of the firms. Among these, the MM theory, Trade-off Theory, *Information Asymmetry Theory/Pecking Order Thoery* and *Agency Cost Theory* have been said to mainly play a crucial role in identifying and testing the various properties of the leverage decisions. In line with the theoretical contributions of these approaches briefly stated in this paper, we have tried to define the fundamentals underlying these theories and evaluates whether some a priori assumed determinants of capital structure decisions can be related to the leverage parameters of interest related to Manufacturing private Limited Companies (MPLCs) in Ethiopia examined in this paper. For this purpose, it estimates Manufacturing Private Listed Companies' leverage as a function of six explanatory variables - profitability, size, growth, tangibility, age, and non-debt tax shields - that exhibit a consistent and stable cross-sectional relationship with the leverage of manufacturing private limited corporate firms. Their sample included five years data from 2006/7 – 20010/11 about 33 companies. For analysis purpose descriptive statistics and pooled cross-sectional ordinary least squares (OLS) are used.

The findings support the notion that Ethiopian Manufacturing Private Limited Companies' debt/equity choice do matter. The empirical results are consistent with a number of theoretical propositions typically associated with the determinants of debt-equity choice of non-financial firms. Specifically, evidence support that Profitability, Growth and Non-debt tax shield establish negative relationship and the remaining three variables (Tangibility, Size, and Age) showed positive relationship with capital structure of Ethiopian Private Limited Companies. The overall explanatory power of the model, as can be vividly seen on Table 3.4 from the R square value, is 61.2%. This is an indication that 61.2% of the change in leverage is successfully explained by the selected firm specific factors (profitability, size, growth, tangibility, age, and non-debt tax shield) or independent variables included in the model. However, the remaining 38.8% changes in leverage are caused by other factors that are not included in the model.

The results of the empirical study suggests that some of the insights from the modern finance theory are portable to the Ethiopia in that certain firm specific factors that are relevant for explaining capital structure in the developed countries are also relevant in Ethiopia. This is true despite institutional differences that exist between Ethiopia and the developed countries. Knowing these factors could help predict the financial structure of a firm. The Pecking Order Theory along with Static Trade-off Theory seems to proved partial explanation.

However, a further investigation of firm specific factors correlated with leverage has shown that neither the Pecking Order theory, trade-off theory and agency cost theory hypotheses derived from the developed countries settings has strong explanatory power in explain the capital choice preference of Ethiopian companies. This is because the fundamental institutional assumptions underpinning the developed countries models are not valid in Ethiopia. The management of the firms prefers equity financing rather than debt financing because the former is not binding. The results imply that significant institutional differences such as the legal system governing companies' operation and banking and security markets, ownership concentration and the corporate governance structure of the listed firms, the agency problems inheriting from public ownership, and the financial constraints in the banking sector are all factors influencing the role of firm specific factors on firm's leverage decisions. Knowing these differences are at least an important as knowing the firm-specific factors they measure.

RESEARCH IMPLICATIONS

This paper has laid some groundwork to explore the determinants of capital structure of Ethiopian Manufacturing PLCs upon which a more detailed evaluation could be based. Further work is required to develop new hypotheses for the capital choice decisions of Ethiopian firms and to design new variables to reflect the institutional influence. A larger, comprehensive, and detailed database is also required for a further detailed capital structure study. In addition, this study has also established a correspondence between corporate governance and capital markets, though preliminary, which should be further studied.

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APPENDIX

APPENDIX – A

NAME OF THE COMPANIES IN THE SAMPLE FRAME

	Company Registration Name
	Building Materials
1	Mesfin Industrial Engineering P.L.C, P.O. Box 2480, Addis Ababa, Ethiopia
2	Messebo Building Materials Production P.L.C., P.O. Box 9620, Addis Ababa, Ethiopia
3	Saba Dimensional Stone P.L.C. (SDS), P.O. Box 180, Adwa, Ethiopia
4	SUR Construction P.L.C., P.O. Box 34360, Addis Ababa, Ethiopia
5	Ezana Mining Development, Marble, P.O. Box 788, Mekelle, Ethiopia
6	Mag International P.L.C., P.O. Box 12196, Addis Ababa, Ethiopia
	Leather Products
7	Ethio-Leather Industry, P.O. Box 9281, Addis Ababa, Ethiopia
8	Becky Leather Articles, P.O. Box 6456, Addis Ababa, Ethiopia
9	Genuine Leather Craft P.L.C., P.O. Box 2218, Addis Ababa, Ethiopia
10	Hora Tannery P.L.C., P.O. Box 472, Debrezeit, Ethiopia
11	Jamaica Shoe Factory, P.O. Box 26430, Addis Ababa, Ethiopia
12	Modern Zege Leather Products Industry, P.O. Box 1035, Addis Ababa, Ethiopia
13	Nyala Shoes & Leather Products Factory, P.O. Box 9357, Addis Ababa, Ethiopia
14	Ras Dashen Shoe Factory P.L.C., P.O. Box 22723, Addis Ababa, Ethiopia
	Textile & Wool
15	NBecky Leather Articles, P.O. Box 6456, Addis Ababa, Ethiopia
16	Gulele Garment Factory, P.O. Box 21769, Addis Ababa, Ethiopia
17	Abdusamed Takele Imp & Exp, P.O. Box 182992, Addis Ababa, Ethiopia
18	Abstrad International P.L.C., P.O. Box 2263, Addis Ababa, Ethiopia
19	Almeda Textile Factory P.L.C., P.O. Box 13383, Addis Ababa, Ethiopia
20	Gheta International Trading, P.O. Box 7391, Addis Ababa, Ethiopia
	Hides & Skins
21	Ethio-Leather Industry, P.O. Box 9281, Addis Ababa, Ethiopia
22	GAAFAR Enterprise Blue Nile Tannery P.L.C., P.O. Box 9339, Sebeta, Ethiopia
23	Hora Tannery P.L.C., P.O. Box 472, Addis Ababa, Ethiopia
24	Sheba Tannery P.L.C., P.O. Box 18313, Addis Ababa, Ethiopia
25	SHOA Tannery P.L.C., P.O. Box 26998, Addis Ababa, Ethiopia
26	WALLIA Tannery P.L.C., P.O. Box 8187, Addis Ababa, Ethiopia
	Food & Beverages
27	Dire Dawa Food Complex, P.L.C., P.O. Box 12674, Addis Ababa, Ethiopia
28	Ethio-Calgarian Trading P.L.C., P.O. Box 20701, Addis Ababa, Ethiopia
29	Huda Trading Import & Export, P.O. Box 8881, Addis Ababa, Ethiopia
30	Yoni International P.L.C., P.O. Box 8881, Addis Ababa, Ethiopia
31	Hiwot Agricultural Mechanization P.L.C., P.O. Box 101577, Addis Ababa, Ethiopia
32	GASCO Trading P.L.C., P.O. Box 130032, Addis Ababa, Ethiopia
33	Ghion Industrial & Commercial P.L.C., P.O. Box 7391, Addis Ababa, Ethiopia

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INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND ORGANIZATIONAL PRODUCTIVITY AND GROWTH: UNIVERSITY OF BENIN IN PERSPECTIVE

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ABSTRACT

Information and Communication Technology (ICT) provides enormous potential for enhancing productivity of human resources in organization. The study investigates the relationship between ICT, organizational productivity and growth in the University. Data generated were analyzed and the various hypotheses were subjected to descriptive and inferential statistics. The main findings were that ICT is an enabler of broad based social and economic development and must therefore be accessible and affordable to all the citizens of the institution. Also, ICT infrastructure, accessibility and connectivity vary greatly from area to area. For instance, some departments/units enjoy to some extent fairly affordable Internet access while some departments/units by contrast, have little or no access to telecommunications infrastructure. It was discovered that ICT has a positive relationship with organizational productivity as work load is reduced, good utilization of labour, and the efficient satisfaction of students. The paper recommends that the administration and regulating body of the institution should facilitate an enabling environment that will ensure availability and affordability of ICT infrastructure across various units of the institution. There is the need to commit more financial resources for training, retraining and improving on the present state of ICT development in the institution.

KEYWORDS
Information and Communication Technology, Productivity and Growth.

INTRODUCTION

In today's business world, for organization to compete effectively, it requires information. This was manifested during the administration of Professor Nwaze as the Vice Chancellor of the University of Benin. He made a strong commitment in improving, sustaining and consolidating on the gains and achievements of his predecessor, one of the gains was the development in Information and Communication Technology (ICT) sector which received foremost attention in the scheme of things in the institution. ICT is one of the valuable resources to increase the organizational productivity and customer satisfaction. Information and communication technology (ICT) is the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications (Lonely & Shain, 1985). Wikipedia (2010) is of the view that ICT is the area of managing technology and spans wide variety of areas that include but are not limited to things such as processes, computer software, information systems, computer hardware, programming languages, and data constructs. In short, anything that renders data, information or perceived knowledge in any visual format whatsoever, via any multimedia distribution mechanism, is considered part of the domain space known as Information and Communication Technology (ICT).

ICT has a potential to influence the structures of organizations and improve the quality of organizational performance significantly. In today's world, telecommunications has become a vital element in the building of infrastructure of nations and economies (Akinboyo, 2008). No modern economy can be sustained today without an adequate and pervasive ICT. Importantly, the advances in Information and Communication Technology (ICT) have compressed the world into a global village. In this era of globalization, ICT has become a very key component in the emergence of new economies of high reckoning. A vast majority of the people, lack access to ICT services. This exclusion and missed opportunities have continuously become a frustrating bane in the nation's effort to bridge the gap in its human development quotient (Akinboyo, 2008). Against this background, these developments have made ICT a vital engine of any economy as it is an essential infrastructure that promotes the development of other sectors as education, health and banking among others.

Technological applications, such as relational database technology, computer-aided designing, word processing, spreadsheets and other software programming, increase productivity and growth of businesses. Productivity and growth are identified as the foundation for economic prosperity, a prerequisite for organizational development and an important indicator for organizational competitiveness (Dedrick, Gurbaxani & Kraemer, 2003).

STATEMENT OF THE RESEARCH PROBLEM

Information has become the live wire of the modern society. With information, man has and will always have a completely new lifestyle. The importance of ICT is not the technology as such, rather its role as an enabler for accessing knowledge, information and communications, which are increasingly vital elements in today's economic and social interactions between people, firms and nations. Against this background, the researcher sought to know:
(i) How important are ICT infrastructures to improved organizational growth and productivity?
(ii) Does the institution organize training in ICT knowledge, skills and expertise for staff and students alike?
(iii) What are the most critical work activities requiring the use of ICT in the institution?

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(iv) Is the data/information processing of records properly managed with the deployment of ICT infrastructures in the University?

(v) Does the deployment of ICT infrastructures in the University reduce the cost of processing of data/information and volume of paper work?

(vi) ICT infrastructures are readily available and accessible within the institution?

HISTORICAL BACKGROUND OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN UNIVERSITY OF BENIN

On the 23rd November, 1970, University of Benin was founded by the then Midwestern State Government. It started as Midwest Institute of Technology and was accorded the status of a full-fledged university by National Universities Commission (NUC) on 1st July, 1971 and became the University of Benin. The university has marked many years of solid achievements and expanding national and international reputation built upon a sense of enterprise, resourcefulness, creativity, innovativeness, astute diplomacy, patriotism, excellence and service.

Since its inception, the institution adopted the use of ICT for various purposes. The University first introduced the Prime Computer in the early 1970s to process various official documents. In an effort to improve on ICT applications the university took its core processes online in a bold initiative in 2003/2004 academic session by laying a fiber optic cable network in Ugbowo Campus of the University. The birth of these online services made the university the first higher institution in Nigeria to go online.

The institution has some existing ICT infrastructure in place consisting of approximately 260 networked computers distributed across 8 digital centres with at least two very small aperture terminal (VSAT) link to the Internet (providing a combined bandwidth of more than 2mbps down and 512kbps up), and Internet cafes located around the campuses. Student's registration, admission, processing of result and other record-keeping functions that use to be done manually are now being done online.

Building on top of the existing infrastructure, Socket Works (SW) Ltd and Global Payment Services (GPS) Ltd deployed new software and training of ICT personnel. The software to power the part-time and post-graduate programmes was provided by Socket Works Ltd while the software to power the full-time programmes was provided by GPS Ltd. There are customized portals with specialized websites such as http://www.unibenportal.com, which manages records for the university's internal programs, course registration, payment of school fees, online display of results, online application for accommodation in the University's hostels, online application and processes for admission into diploma, part-time and post-graduate programmes and students results reporting are enabled and streamlined with cards available for purchase from designated banks. While http://www.uniben.edu is used for information dissemination and public relations within and outside the University community. This is the first deployment of Socket Works and Global Payment Services College Portal software in a production environment.

The deployment was a resounding success. One year later, the students' database comprised records of 1,000 full time students, 6,000 part-time undergraduate students had successfully registered for the courses online, grades for 5,000 undergraduate part-time students had been successfully uploaded, the admission process was fully online for all internal programs, and payment of school fees was online for all programs. The introduction of College Portal brought about an increased awareness of ICT and improved productivity across the university, especially among users who had not previously used a computer in the past.

In 2004, the ICT unit was split into two unit that were: University Networking Unit (UNU) and Central Records Processing Unit (CRPU). The UNU handled the network infrastructure, bandwidth management and distribution of Internet facilities while the CRPU was in charge of processing of students records. Presently, all the units have been merged and it is now called "ICTU-CRPU".

From the foregoing, it can be seen that the deployment of ICT infrastructure in the institution is to ensure an effective and efficient information dissemination to enhance productivity and growth of the organization. This deployment of ICT infrastructure promotes purposeful learning, teaching and working condition of all and sundry in the institution.

Despite these feats with the use of ICT infrastructure the institution is still saddled with some challenges such as epileptic power supply, inadequate supply and accessibility of ICT infrastructure, poor weather condition causing the destruction of vital ICT infrastructure such as MODEM, power supply unit, VSAT, and so on and disruption of services.

ICT AS STRATEGY AND COROLLARY FOR ORGANIZATIONAL PRODUCTIVITY AND ECONOMIC GROWTH

Access to telecommunication and information technology holds the key to the organization's ability to respond to the demands of its position in the new world order. Access to modern telecommunications services should necessarily be within easy reach of every person that lives within shores of the institution. This is essential to drive socio-economic development, growth and improve the productivity of the organization (Englama & Bamidele, 2002). Information and communication technologies can substitutes for other forms of communication (mainly data processing with typewriters, postal service and personal travel) and are often more effective and more efficient than other forms in their use of time, energy and materials and in their effect on the quality of the environment. Electronic networks now make it possible for people to interact, coordinate action, gain access to and exchange information from computers. The networks provide numerous services including the e-mail, the World Wide Web, information retrieval, e-commerce, students' portals, news groups, intranets, extranets, games and chats. Staff and students in the institution can freely share ideas, data, opinions and products. Rapid expansion of the Internet holds substantial promise for organizations, which can benefit greatly from the Internet's communication and information delivery capabilities to help meet their needs. Many organizations operate on-line through the use of very small aperture terminal (VSAT). This helps to promote the goal of paperless transaction in the institution.

In the views of Caesar & Cororaton (2002) productivity refers to the additional output generated through enhancements in efficiency arising from advancements in workers education, skills and expertise, improvements in an organization's gains from specialization, introduction of new technology and innovation or upgrading of existing technology and enhancement in information and communication technology (ICT) as well as a shift towards higher added-value processes.

ICT has the potential to accelerate economic development by promoting economic growth by facilitating the generation or increase of another source of income and investment, thus enhancing sustainable development and welfare economy. In addition the spread of computing power has reduced radically the costs for companies of collecting, analyzing, retrieving and re-using information (Harker, 2000).

In terms of increasing effective management, the decentralized availability of information through ICT allows the reduction of hierarchical structures within firms and greater empowerment and capabilities for work teams and individual workers (Morrison & Berndt, 1990). They added that it can transform a firm's relations with its customers, providing increased scope to tailor products to individual requirements. In other words, investment appears to have a greater beneficial impact if complemented by organizational changes, greater use of delegated decision-making and improvements in related workforce skills. These benefits from ICT to improved productivity can be categorized as tangible and intangible (Sheng, Nah & Siau, 2005). The tangible benefits include reduced cost, improved productivity, increased market share, saving in labour, increased consumer surplus (i.e. the accumulated difference between consumer demand and market price), improved customer service quality, improved organizational efficiency, quicker response to customers, deeper knowledge and understanding of customers. On the other hand, the intangible benefits include, improved decision-making ability, superior product quality, knowledge/information management and sharing, improved coordination/relationships with partners and other forms of competitive advantages.

Also, ICT enablers are crucial for technology to work. Specifically, the ICT enablers include appropriate education, skills training, research and development (R&D), access to venture capital, affordability of Internet access, security of Internet infrastructure, government support for ICT development, and quality of ICT supporting services (Chandra, 2007). Another equally important enabler is the recruitment as well as promotion processes and recognition of professional skills attainment. Thus, for ICT to enhance productivity effectively, firms ought to invest in ICT infrastructure and in ICT enablers if benefits from ICT are to translate into higher organizational productivity on sustainable basis (Englama & Bamidele, 2002).

HYPOTHESES

This study is set to test the following hypotheses:

(i)　　　Ho: There is no positive relationship between the current level of ICT adoption and the level of productivity in University of Benin

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H$_1$: There is a positive relationship between the current level of ICT adoption and the level of productivity in University of Benin

(ii)   Ho: The ICT personnel are not educated enough in the area of skills and expertise in handling ICT infrastructures

H$_1$: The ICT personnel are educated enough in the area of skills and expertise in handling ICT infrastructures

METHODOLOGY

Primary and secondary data constitute the sources of data in the form of questionnaire, personal interview, direct observation, textbooks, journals, seminar papers, magazines as well as materials from the Internet. The target population of study is the academic and non-academic staff as well as students of University of Benin. A sample size of three hundred and fifty respondents (using stratified random sampling technique) was selected for the study in order to obtain a representative sample of the population under consideration.

The instrument used for the study was a survey questionnaire divided into two sections numbered A-B. Section A elicited background information of the respondents and the organization. Section B sought information on the skills, availability, accessibility etc of ICT infrastructure as a means of organizational growth and productivity. The questionnaire was tested for reliability and a coefficient of 0.84 was obtained by means of Product Moment Correlation Statistics. Of the three hundred and fifty questionnaire administered (100 to lecturers, 150 to non academic staff and 100 to students), three hundred and thirty-five were retrieved (95 from lecturers, 144 from non-academic staff and 96 from students) out of which five were not useable. This gave a percentage response of 94%. The method of data analysis and the techniques used were chosen based on the nature of the research problem and the data collected. Data analysis was descriptive and involved computing the percentages and averages of the responses. The hypotheses were tested by means of the chi-square test statistic.

RESULTS AND DISCUSSION

Research Question 1: How important are ICT infrastructures to improved organizational growth and productivity?

TABLE 1: IMPORTANCE OF ICT INFRASTRUCTURES TO IMPROVED ORGANIZATIONAL GROWTH AND PRODUCTIVITY

Rating (scale 5-1)	Frequency	Percentage (%)
Very Important	181	54.8
Important	102	30.9
Average Importance	35	10.6
Low Importance	12	3.6
Not Important	-	-
Total	**330**	**100**

Source: Field Survey, 2011

The table shows that most of the respondents (54.8%) were of the opinion that ICT infrastructures are very important to organizational growth and productivity. None of the respondents see ICT infrastructure as not important to organizational growth and productivity.

Research question 2: Does the institution organize training in ICT knowledge, skills and expertise for employees and students alike.

TABLE 2: TRAINING PROGAMMES IN ICT KNOWLEDGE, SKILLS AND EXPERTISE FOR EMPLOYEES AND STUDENTS ALIKE?

Response	Frequency	Percentage (%)
Yes	102	30.9
No	228	69.1
Total	330	100

Source: Field Survey, 2011

The table shows that 69.1% of the respondents is of the view that the institution do not train staff and student in the acquisition of knowledge, skills and expertise in the use of ICT infrastructure while 30.9% of the respondents disclosed that the institution train staff and students in ICT knowledge, skills and expertise. It must be emphasized that 30.9% is very low when considered against the need to move with the trend of technological advancement in the field of ICT infrastructure.

Research Question 3: What are the most critical work activities requiring the use of ICT in the institution?

TABLE 3: MOST CRITICAL WORK ACTIVITIES REQUIRING THE USE OF ICT IN THE INSTITUTION

Activities	Level of Involvement (%)
Managing the accounts/finance of the institution	75
Managing records for the institution's internal programs	70
Managing course registration	80
Payment of school fees	92
Online display of results	65
Online application for accommodation	81
Online application and processing of admission	90
Managing information dissemination and public relations	68
Teaching and e-learning	32

Source: Field Survey, 2011

Research Question 4: Is the data/information processing of records properly managed with the deployment of ICT infrastructures in the University?

TABLE 4: MANAGEMENT OF DATA/INFORMATION PROCESSING OF RECORDS WITH THE DEPLOYMENT OF ICT INFRASTRUCTURES

Response	Frequency	Percentage (%)
Yes	187	56.7
No	143	43.3
Total	**330**	**100**

Source: Field Survey, 2011

The table shows that 56.7% of the respondents are of the view that the institution is performing well with the management and processing of records with the deployment of ICT infrastructures while 43.3% of the respondents are still not satisfied with the level and management/processing of records with the deployment of ICT infrastructure.

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Research Question 5: Does the deployment of ICT infrastructures in the University reduced the cost of processing of data/information and volume of paper work?

TABLE 5: THE COST OF PROCESSING OF DATA/INFORMATION WITH THE DEPLOYMENT OF ICT INFRASTRUCTURES

Response	Frequency	Percentage (%)
Yes	192	58.2
No	138	41.8
Total	**330**	**100**

Source: Field Survey, 2011

From the table above, 58.2% of the respondents are of the view that there is a reduction in the cost of processing data/information with the deployment of ICT infrastructure while 41.8% of the respondents are of the view that the deployment of ICT infrastructure did not reduce the cost of processing data/information.

Research Question 6: ICT infrastructures are readily available and accessible within the institution?

TABLE 6: AVAILABILITY AND ACCESSIBILITY OF ICT INFRASTRUCTURES WITHIN THE INSTITUTION

Response	Frequency	Percentage (%)
Yes	143	43.3
No	187	56.7
Total	330	100

Source: Field Survey, 2011

From the table above, 43.3% of the respondents agreed that the availability of ICT infrastructure are fully accessible by staff and students while 56.7% are of contrary view that the deployment of ICT infrastructure are not fully available for accessibility by staff and students.

TEST OF HYPOTHESIS

The two hypotheses formulated for this study are tested using the Chi-square test.

TEST OF HYPOTHESIS 1

The hypothesis was tested on the basis of field survey which relied on the questionnaire administered.

Ho : There is no positive relationship between the current level of ICT adoption and the level of productivity in University of Benin

H_1 : There is a positive relationship between the current level of ICT adoption and the level of productivity in University of Benin

Responses	Observed Frequency (Fo)	Expected Frequency (Fe)	Fo-Fe	(Fo-Fe)^2	(Fo-Fe)^2/Fe
Strongly Agree	150	66	84	7056	106.91
Agree	100	66	34	1156	17.52
Neutral	3	66	-63	3969	60.14
Disagree	60	66	-6	36	0.55
Strongly Disagree	17	66	-49	2401	36.38
Total	**330**	**330**			χ^2_{cal} =**221.5**

The table presented was analyzed using the chi-square test statistic, given as χ^2 = (Fo-Fe)^2/Fe

Degree of freedom (df) = n- 1, where n is the number of categories

Degree of freedom (df) = 5-1 = 4

The calculated value is 221.50

The table value of $\chi^2_{0.05,4}$ = 9.488

Since the calculated value is higher than the tabulated value, we reject the null hypothesis (Ho) in favour of the alternative hypotheses (H1) which states that there is a positive relationship between the current level of ICT adoption and the level of productivity in University of Benin

HYPOTHESIS 2

Ho: The ICT personnel are not educated enough in the area of skills and expertise in handling ICT infrastructures

H_1: The ICT personnel are educated enough in the area of skills and expertise in handling ICT infrastructures.

Responses	Observed Frequency (Fo)	Expected Frequency (Fe)	Fo-Fe	(Fo-Fe)^2	(Fo-Fe)^2/Fe
Strongly Agree	88	66	22	484	7.33
Agree	92	66	26	676	10.24
Neutral	37	66	-29	841	12.74
Disagree	59	66	7	49	0.74
Strongly Disagree	54	66	-12	144	2.18
Total	**330**	**330**			χ^2_{cal} =**33.23**

Degree of freedom (df) n-1, 5-1 = 4

The calculated table is 33.23

The value of $\chi^2_{0.05,4}$ = 9.488

Since the calculated value is higher than the tabulated value, we reject the null hypothesis (Ho) in favour of the alternative hypotheses (H1) which states that the ICT personnel are educated enough in the area of skills and expertise in handling ICT infrastructures.

FINDINGS, RECOMMENDATIONS AND CONCLUSION

The study was carried out to determine the importance of ICT infrastructures in improving organizational growth and productivity, to determine whether the institution usually organize training in ICT knowledge, skills and expertise for employees and students alike, to ascertain the most critical work activities requiring the use of ICT in the institution, to determine whether there is proper management of data/information processing of records with the deployment of ICT infrastructures and if there is reduction in the cost of processing of data/information with the deployment of ICT infrastructures. It was also to determine if the availability of ICT infrastructures within the institution are accessible to staff and students.

The following empirical findings were made:

EMPIRICAL FINDINGS

1. ICT infrastructures are very important to the success and improvement of productivity in an organization.
2. A gap exist between the accessibility of available ICT infrastructure in the institution.
3. It was discovered that investing in ICT has a positive relationship with organizational productivity.
4. The cost of processing of data/information with the deployment of ICT infrastructures and volume of paper have reduced.
5. Not much has been done in the area of training in ICT knowledge, skills and expertise for employees and students in the institution.

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6. The most critical work activities performed with the deployment of ICT infrastructures in the institution are managing the payment of school fees, online application and processing of admission, application for accommodation, information dissemination and public relations, application for accommodation, display of results, course registration, and so on.

RECOMMENDATIONS

1. There is the need to commit more financial resources for training, retraining and improving on the present state of ICT development in the institution to enable effective and efficient use of the ICT infrastructure.
2. A compulsory credit course should be introduced to all students of the institution that involves the use of the Internet in order to optimize e-learning.
3. The institution should facilitate an enabling environment that will ensure availability and affordability of ICT infrastructure across various units of the institution.

CONCLUSION

Increasing productivity is one of the critical prerequisite for economic development. The study has successfully investigated the relationship between ICT and organizational productivity. It is now clear that success stories are widely and readily available of organizations that have used ICT to drive the economic growth and increased productivity of their organization. Such successes would not have been achieved without a properly focused and consistent ICT policy orientation. The research work was constrained by restricted access to information. However, there is still room for improvement and it is hoped that the contributions made in terms of recommendations for the enrichment of institution would contribute to the development of ICT infrastructures.

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ORGANIZATION DEVELOPMENT IN CITY TRAFFIC POLICE LAHORE- A CASE STUDY

BINISH NAUMAN
LECTURER
COMSATS INSTITUTE OF INFORMATION TECHNOLOGY
LAHORE, PAKISTAN

ABSTRACT

The following case study analyzes the largest and most challenging change process occurred in a government sector service organization within the department of Police i.e., establishment of city traffic police(CTP) in the city of Lahore, Pakistan. This change process was administered by internal OD practitioners. Focus of case study is on three main issues, Firstly, finding reasons for change, Secondly, how OD was conducted at CTP(LHR) and finally analyzing the impact of this OD process. Techno structural, Human Resource Management and Cultural Change Interventions were used to transform CTP(LHR). As this case study seeks to provide some first steps into a new and little explored area of CTP(LHR) so exploratory research method is used. Data is collected from various sources i.e., semi structured interviews, focus group discussions, personal observations, informal interviews and the review of the existing literature. Findings of the case study gives evidence that service quality and organizational performance improved after the change process that had taken place at CTP(LHR) over the past three years. Despite some instances of resistance and opposition to change (specially on having no room for promotion) interviews and discussions seem to indicate general increases in communication, employee participation and, as a whole, an acceptance of the change in culture both within organization and among general public.

KEYWORDS

City Traffic Police (Lahore), Organization Development, OD Interventions.

INTRODUCTION

rganization Development (OD) is a unique but complicated way of changing minds, behaviors and attitudes of persons within organizations along with structure of organizations so that employee could better adapt to new technologies, markets and challenges. The main purpose of employing all OD methods and techniques are improving effectiveness of organizations. Different researchers have defined differently this phenomenon but all including (Burke 1982, French 1985, Beckhard 1969 all cited in Waddell *et al.,* in 2000) agree on this statement that "*OD is a planned change"*. Beckhard (1969, p.2) has defined OD as

"It is an effort (1) planned (2) organization wide, and (3) managed from the top (4) to increase organization effectiveness and health (5) through planned interventions in the organization's processes using behavioral science knowledge."

Globalization, new technology & changing trends in management are some of the factors forcing organizations to go through this complex process of OD. Number of organizations worldwide whether manufacturing or service is going through OD to survive in this dynamic environment (Waddell, *et al.*, 2000). Different researchers have given their own model/steps taken for conducting OD but the earlier most recognized change model is given by Lewin(1951) based on three steps.

- Unfreezing
- Movement
- Refreezing

In unfreezing stage organizations do diagnosis of their problems. Difference between desired and actual outcome is highlighted and communicated to organization members. During this phase employees are motivated and they feel the need for change (Schein, 1987).

Next phase is movement in which behaviors are transformed at organization, department and individual levels. In this phase new ways of performing tasks, new culture and new value system is developed within organizations (Waddell, *et al.,* 2000). In third phase organizations attain a new position. At this point of OD evaluation of the whole change process is necessary. This phase highlights which practices to continue and which behaviors and actions further need modification (Lippit, *et al.,* 1958).

OD's main focus is on bringing positive change and improving the strategies, design components and processes of organizations. Strategies guide organizations about usage of their resources for gaining competitive advantage e.g., planning about their products and services, exploring new markets and customers etc. OD is about making decisions related to change in Organization structure and about introducing new human resource practices to meet the changing demands of their human resources. As far as processes are concerned OD involves interaction of organization members, their level of communication, their way of performing various tasks, etc. In short, OD is a process which brings all above three components i.e., strategies, design components and processes in alignment so that organizations could perform more effectively and gain competitive advantage (Cummings, 2004)

OD went through various evolutionary stages. Every era focuses on different problem areas and highlighted various OD techniques to improve organization's efficiency. Lewin's (1946) work related to "T Groups" is considered as start of OD intervention within organizations. In the second era of OD named "Action Research" studies conducted by Lewin(1946) demanded the close link of action to research if organizations wanted to manage change successfully. The third development in the field of OD was participative management. Major contributions for this era was by Likert(1967). Trist (1951) and his colleague's research related to interconnection between technical and human side of organizations led to another development in the field of OD i.e., productivity and quality of work life. Due to changing, complex and dynamic environment, the recent influence in OD's evolution is strategic change which demands organizations to have fit not only with their environments but their technical, political & cultural systems should be aligned together (Jelinek, Litterer 1988, cited in Waddell *et al.,* 2000).

In current scenario, a blend of all above mentioned eras is used to develop any organization for making it more effective. The basic focus of OD is to change minds, behaviors and attitudes of organization's members. Different types of interventions are used now a days depending on the nature of the problem diagnosed e.g.,

- Human Process Interventions …….. Focusing mainly on communication, problem solving, group decision making and leadership with the expectation that organizational effectiveness will result due to improved functioning of people and organizational processes (Friedlander, Brown 1974, cited in Waddell *et al.,* 2000).
- Techno Structural Interventions……. Focusing mainly on productivity and human fulfillment with the expectation that organizational effectiveness is a result of appropriate work designs and organization structures (Lawler 1992, cited in Waddell *et al.,* 2000).
- Human Resource Management Interventions……. Focusing mainly on people within organizations expecting that organization's effectiveness will result from improved practices related to employees(Waddell *et al.,* 2000)
- Strategic Interventions…….. Focusing mainly on fit between strategies, culture and larger environment to have pace with changing situations (Waddell *et al.,* 2000)

In Pakistan many organizations are adopting this technique to be competitive. Habib Bank Limited (HBL) was privatized in the year 2004(Habib Bank Limited, no date). Restructuring of United Bank Limited (UBL) is another example of OD taken place in Pakistan. It was a long process which started in 1991 with privatization of UBL but ended in failure. Afterwards whole OD process was divided into three phases starting from 1997-1998 onwards. The main purpose of all this was to

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reposition UBL for privatization which was in the end successful. Success of OD in UBL gave the lesson that if change is planned properly then dying dinosaurs could be made vibrant and competitive entities (Kazmi, 2002). Organizations undergoing OD not only rebuild their strategies, structures and processes but also transform minds and belief system prevalent in their respective organizations. In this case study one of the largest and most challenging change process occurred in Pakistani Government sector service organization is analyzed i.e., OD in City Traffic Police Lahore(CTP LHR). Focus of this case study is on three main issues. Firstly, this case study focuses on finding reasons that why change was needed in traffic police department? Secondly, it focuses on how OD process was conducted at CTP (LHR) and finally this case study analyzes the impact of OD process.

RESEARCH METHODOLOGY

This case study is an exploratory case study. Exploratory research is typically used when there is little or no previous research or theory on the subject under investigation. Exploratory studies can in fact be understood as "condensed case study research" or as a "prelude" for further more in depth inquiry (Sekaran, 2000). This research method is famous for its flexibility because while conducting exploratory study researchers could address research questions of all types i.e., what, why and how (Shields, et al., 2006). As such this study seeks to provide some first steps into a new and little explored area of CTP (LHR) by trying to better understand the effect of this change process.

This study offers some tentative findings and seeks to inspire and guide further research into this field. Qualitative information was collected for this study. The main reason for choosing this department for analyzing the change process was that this department has continuous interaction with general public. And the change process within this department would have a strong impact and deep effect on general public and their behaviors on road. Standard qualitative methodology was used for this exploratory study, including semi structured interviews, focus group discussions, personal observations, informal interviews and the review of the existing literature.(Appendix 1) Relevant written sources including media reports were also analyzed. Besides getting primary information, secondary data taken from concerned traffic police department is also used in this case study. Major focus of data collection was to have firsthand knowledge related to reasons for conducting OD process within CTP(LHR) and how this process was carried out and finally drawing conclusions whether this whole exercise was useful or not.

FINDINGS

This case study has three fold objectives i.e., finding reasons for change, OD process at CTP (LHR) and impact of change. Following headings will stepwise highlight the facts about these issues. These findings are drawn from primary and secondary data collected for this research.

REASONS FOR CHANGE

Lahore is the second largest city of Pakistan having strong cultural background. The contribution of Lahore to the National economy is supposed to be around 13.2% (Economic Progress Report, 2009). Lahore's population is increasing at a greater pace (Table 1). People form smaller cities/villages are also migrating to Lahore for availing employment and education facilities. This rapid increase in population is creating a havoc of traffic on roads. In the last few years there is tremendous increase in the number of vehicles in Lahore (Table 2).

TABLE 1: BRIEF FACTS ABOUT LAHORE*[1]

➢ Population (Millions-2008 estimates)	8.6 M
➢ Area	1772 Sq. Km
➢ Motorized vehicles registered up to 31-12-09	2.231 M
❖ Private Vehicles	
Motorcycles	13,13,303
Cars/Jeeps	6,24,964
Tractors	30,395
❖ Commercial Vehicles	
Rickshaws/Taxies	92,842
Wagons/Vans/Pick-ups	1,15,665
Buses/Mini Buses/Coaches	34,260
Other Vehicles Registered	19,600

TABLE 2: INCREASE IN NUMBER OF VEHICLES AND ACCIDENT'S TREND[2]

Year	No. of Vehicles	No. of Accidents	Accidents – Vehicles %age	Trend
2004	11,60,722	706	0.060	
2005	13,53,656	674	0.049	
2006	15,76,536	685	0.043	
2007	18,13,089	728	0.040	
2008	19,95,694	764	0.038	
2009	22,31,029	705	0.031	

One side of the picture shows tremendous increase in the number of registered vehicles and the other side is showing another horrible picture of poor infrastructure of roads in Lahore. Defective road engineering is another factor making traffic problems more complicated. The underpasses on the canal road are on a zigzag pattern, which leads to utter confusion for the drivers. As most of the drivers are unaware of the fact that coming underpass is on right or left, they most of the time end up changing lanes at the last minute resulting in endangering the traffic. Roads that were meant to accommodate much less number of vehicles would not be able to provide sufficient parking space for the new vehicles resulting in encroachments all over the city (Hassan, 2006). Poor condition and service of urban transport is also leading to this sharp increase in the number of vehicles.

Banks have also added complexity in the problem by leasing motorcycles, cars on easy terms. General public was getting dissatisfied from the traffic police and traffic on roads; complaints from public were increasing and on the other side corruption within traffic Police department were also on rise.

Keeping all these above mentioned problems in view it was crucial to transform this service sector organization. Traffic police department has been experiencing what could be termed as "evolutionary changes" ever since it was first created. In the year 2002, Punjab government introduced ticket system for violations with a warning to traffic policemen to implement the law without any discrimination and treat people with respect. (Hanif, 2002). In the early stages of its operation, traffic officers had police type duties and over the years their duties have been predominately focused on issuing of infrangement notices. But now CTP (LHR) is not reactive instead proactive in managing traffic flow, road safety and information services. In an effort to satisfy these concerns, CTP(LHR) provide services such as the investigation, design and supervision of traffic management systems, supervision of school/college crossings, investigation and design and review of road markings for traffic control and production and the construction and maintenance of traffic signs.

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[1] * Information in the table is taken from CTP(LHR) Education Wing
[2]   Information in the table is taken from CTP(LHR) Education Wing

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They also maintain safety zones and pedestrian crossings. They provide and set up temporary road barriers when required. Their services also include the management and prevention of traffic jams in case of emergencies (like construction of roads, VIP Protocol) and during special events (like Sports Matches), they give alternate traffic plans. CTP (LHR) is also involved in enforcing and administering all traffic laws. They monitor all actions of two wheelers and four wheelers and take appropriate action in case of violation of any law.

Apart from the activities normally expected in CTP (LHR), the organization has extended its duties due to recent terrorist activities. Now they are also involved in planning and preparing for emergency situations that may range from small scale emergency plans –bomb blasts to natural disasters. Due to this change process, CTP (LHR) has recognized that they should play a fundamental role in customer service. Now one of the most urgent corporate goals of CTP (LHR) is to deliver quality services that are responsive to general public expectations and also subject to public accountability. The main customers are all the people on roads irrespective of their gender, race, religion and especially status.

OD PROCESS AT CTP (LHR)

As the situation of traffic was becoming uncontrollable on roads, Punjab government decided in the year 2006 to take stern action and resolve this problem (Hassan, 2006). For this purpose total transformation of the traffic department was required. Previously traffic police was under the command of Deputy Inspector General (DIG) Punjab, but now Government has placed the CTP (LHR) under the command of Capital City Police officer (CCPO) Lahore to create a unity of command and for better management (Figure1). CTP (LHR) comprises of approximately 3000 freshly recruited and trained Traffic Wardens (TW's) (Table 3). The base line education criteria for these wardens are graduation. The Punjab Government has also created a new service I.E "Traffic wardens Services" which provides the operating and governing rules for the traffic wardens (Department of City Traffic Police Lahore, 2006).

CTP (LHR) has experienced changes in many areas and their impact has affected the organization in different degrees. Some of the changes that CTP (LHR) has undergone are:

- Women were introduced as TW's to carry out duties.
- TW's related to different nationalities and cultures were introduced.
- Computerized technology was introduced.
- Customer oriented approach was adopted.
- Work practices and policies within CTP (LHR) were altered and modified.
- New vision/mission, objectives and management approaches were introduced.

FIGURE 1: ORGANIZATIONAL CHART OF CPT (LHR)
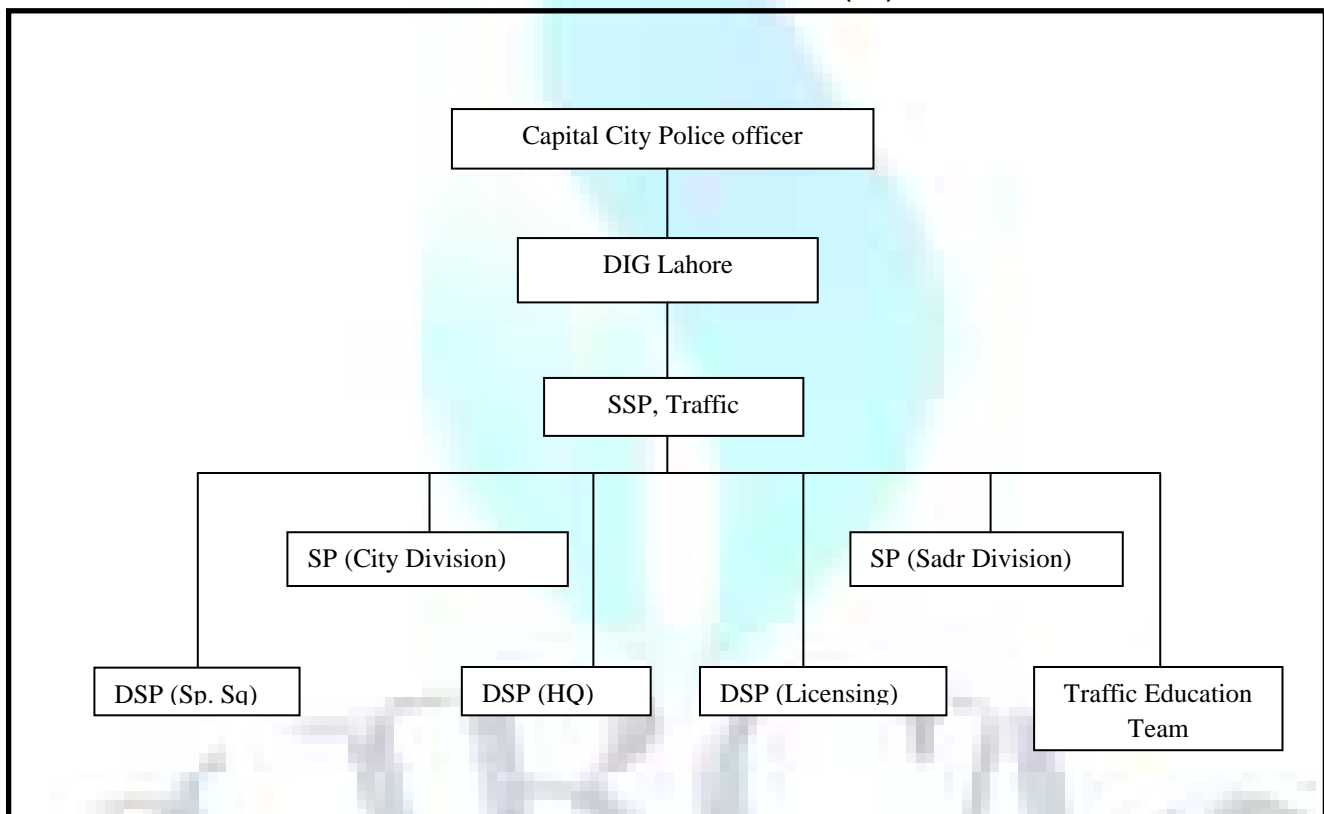
TABLE 3: MANPOWER AS ON 31.01.10*[3]

DIG/CTO	SSP/HQ	STO SP	TO DSP	STW INSP	TW
1	1	2	14	215	3400

The aim of CTP (LHR) is to improve the quality of work through efficiency and effectiveness by promoting a customer oriented culture. This being one of the largest and challenging change process, it was essential to evaluate its progress for further applying this change in different cities.

Therefore, this case study will focus on following main areas that were the most significant to the change process:

- Techno structural Change
- Human Resource Management Change
- Cultural Change

TECHNO STRUCTURAL CHANGES

Techno Structural changes basically focus on change programs in technology and structure of organizations (Waddell, *et al.,* 2000). Rapid environmental, global & technological changes compels organizations to alter their structures… make them more flexible and leaner. These changes were also brought in CTP (LHR). In

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[3] Information in the table provided by CTP(LHR) Education Wing

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previous system Lahore's traffic was under the control of DIG (Punjab) but now considering the fact that Lahore being the larger city and having tremendous traffic flow should be treated independently. For this purpose self contained unit organization (Waddell, *et al.,* 2000) structure is created (Figure 1) this system represents the different way of organizing by dividing the Lahore city into two geographical areas i.e., Sadar Division and City division. The second step taken to bring techno structural change in CTP (LHR) is introduction of Employee involvement (EI) (Waddell, et al., 2000) within organization. Traffic wardens are given autonomy in their work. More participative system of management is introduced by having direct liaison of traffic wardens till DSP level on daily basis. Once a month, SP traffic police arrange a meeting with traffic Wardens to have direct access to their issues. For promoting effective accountability, senior management is held responsible for subordinates' misdeeds. Information flow within department is not a big issue now because every warden is well equipped with wireless systems.

They have given motor bikes for quick access to their destinations also. All the traffic wardens are specialized in their fields. Previously Traffic Police Constables (Term Used in previous system) were not that much educated and were given training in all aspects of police but now mode of training is quite altered. It is more traffic oriented. As they all are at least graduates so the impact of training is more fruitful. According to Lawler, Ledford (1981), cited in Waddell *et al.,* (2000) employee involvement is directly linked with increasing the productivity and efficiency (Figure 2). Data collected reveals that this theory is applicable to TW's also after introducing this technique.

FIGURE 2: SOURCE (NATIONAL PRODUCTIVITY REVIEW, 1:1 (WINTER 1981-82).COPYRIGHT 1982 BY EXECUTIVE ENTERPRISE, INC, 22 WEST 21ST STREET, NEW YORK, NY 10010-6904.ALL RIGHTS RESERVED) CITED IN WADDELL ET AL., (2000)
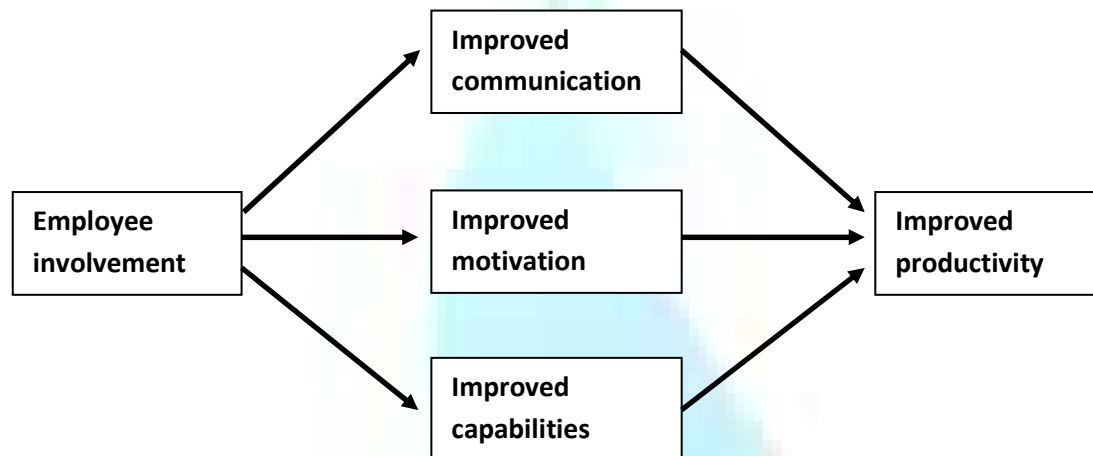
Various processes and systems are also altered during this change process. Official website of CTP (LHR) was also launched on May 3, 2008.Besides displaying information regarding CTP (LHR) infrastructure, daily diversion plans are also accessible on the website. Soon traffic information will be available through SMS and MMS in everyone's access. Help Line number 1915 is activated which is responding immediately about all concerns related to traffic. By calling on this number any resident of Lahore could easily know the situation of traffic on roads, any diversion plans or closure of roads. Traffic police is also managing a FM radio station whose main objective is to educate people regarding traffic issues. This FM Radio station is made under Private/Public collaboration.

Traffic is being monitored through CCTV cameras to be more effective. Previously there was no system of check and balance of licenses issued for vehicles. Now physical presence of the person in need of license is necessary in front of TW's. Introduction of female wardens and their presence on different license centers has made the task easy and comfortable for female customers also. Licensing system is also improved by increasing the number of booths across Lahore City (8 Booths) keeping in mind the increasing number of population. Concept of home delivery of the license is recently launched.

HUMAN RESOURCE MANAGEMENT CHANGE

To bring change Government decided to recruit totally new blood. It was aimed when this plan was being proposed that all recruitment in traffic police department will be done on merit and those who have professional capabilities will be given jobs (Hassan, 2006). All new staff recruited is well educated and afterwards they are trained for 9 months. Foreign Trainers were called in for this professional training. During this tenure of training they are taught different courses like Pakistan Penal Code (PPC), Criminal Procedure Code (CrPC), Evidence Law, Motor Vehicles Ordinance, etc. Major difference in training brought after all this change is of changing warden's mind sets. The term "Police" previously used for is replaced by "Warden" showing the intention of the Government. Now it is regularly reinforced into their minds of becoming "facilitators" on road. They would be on roads to serve and guide people instead of commanding them. Data collected gives evidence that there is huge decline in number of complaints against TW's. In previous system people were facing problems due to the rash and arrogant behavior of traffic constables. After completion of their training these TW's were not directly pushed to stand on roads instead proper procedure of orientation was followed. For few days they were on roads as observers so that they could get the feeling of traffic and get over their shyness. Officially it was asked from the general public to co operate with the new force and forgive them for their small mistakes. Afterwards they were properly on roads for their duty in May 2007.

For keeping their staff motivated compensation system was also improved during this OD process. Not only these TW's were paid high market based salaries but their working hours were also made flexible. Previously traffic constables were available 24/7 resulting in inefficient and poor performance. In new system TW's work in two shifts of 8 hours which starts at 6.00 am in the morning to 12.00 midnight. They are also given 4 holidays in a month. On every Chowk or main point of the city three Traffic wardens are on duty at a time. One is on motor bike doing patrolling and the other two standing and managing the traffic. They are now given standing umbrellas for shelter. Mobile canteens are available for timely provision of water facility for TW's on duty. These TW's are also provided with the facility of residence on Thokar Niaz Baig in Lahore. Proper residential colony, club, library facility is under construction for them.

CULTURAL CHANGE

New TW's are on roads with a new vision and approach. According to high officials of CTP (LHR), new force does not compromise on Courtesy, integrity & efficiency. Now their mission is to

"Extend unqualified courtesy, unasked assistance, guidance where asked for or required, efficiency of the highest order, unprecedented performance and integrity beyond doubt" (Department of City Traffic Police Lahore, 2006)

Under this OD process the new vision, mission and values of traffic police department are outlined. The new system puts emphasis on adopting customer oriented approach. CTP (LHR) recognized the need not only for individual attitudinal and behavioral changes but also for continually improving its work practices in the pursuit of their new culture. For achieving this target continuous feedback, interactive sessions are being held by high officials. Traffic warden's knowledge and skills are kept up to date through refresher courses. These all steps helped to foster new customer oriented culture. Traffic wardens are trained through various training programs relating to stress management, interpersonal skills development, general knowledge about different sites in Lahore because now they are on roads not only to manage traffic but to act as information officers and facilitators for general public.

Traffic wardens are now encouraged to do presentations of their research. There is education wing working in CTP (LHR) who does various informative seminars in Universities, colleges, banks etc to educate people regarding different traffic issues (Table 4)

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TABLE 4: TRAFFIC AWARENESS PROGRAMS CONDUCTED BY CTP(LHR) EDUCATION WING[4]

TV Program	**22**
Radio Program	14
Lecture to Student	2561
Lecture to Driver	103678
Banners	3252
Seminars	68764
Board	09
Sticker	63771
Pamphlet	246862
Traffic Weeks/Traffic Walks	06
Public Addresses	1290

IMPACT OF OD

Qualitative Information collected through primary and secondary sources reveals that outcome of this OD process within CTP (LHR) was positive. This change is highly appreciated in print and electronic media. New force of TW's in Lahore is busy in applying laws to all automobile drivers irrespective of the kind of automobile and background of the driver. Ordinary men and VIP's, all are treated equally by bringing fair play to at least one area of administration of our Government. People of Lahore are also responding positively to this change. Now they respect the orders passed by these TW's. One could hardly witness any person using cell phone while driving resulted from the awareness created by these TW's. The most evident impact of all this OD process is decline both in number of accidents (Table 2) and violations done by public on roads in past few years (Table 5). Data clearly shows that people are respecting laws and TW's are successful in managing this huge flow of traffic on the same infrastructure of roads and urban transport which was available to the previous traffic police force on roads.

TABLE 5: DECLINE IN THE REVENUE COLLECTED FROM FINES.*[5]

	Year 2009	Year 2008	Difference
Tickets	21,67,939	14,20,480	+0.747 M
Fines	440.834 M	463.682 M	-22.84 M

[5]OD in CTP (LHR) is still continuing. Government has provided this force with specialized equipment such as speed checking devices, accident vehicle cutters, digital cameras, multimedia, computers, first aid boxes, electric rods, traffic cones, reflecting jackets and blinkers. Communication equipment for this force includes 25 base sets, 3,075 mobile wireless sets and 5,350 walkie talkie sets. They are well equipped with motor vehicles, all leading towards more efficient traffic force for the city of Lahore. Besides this, Ring road project is under completion which will aid these traffic wardens in controlling traffic because this infrastructure will divert the pressure of most of the traffic from within Lahore to Ring Road.

CONCLUSIONS

Overall, there is evidence to suggest that service quality (Table 5) and organizational performance(Table 2) improved after the change processes that had taken place at CTP (LHR) over the previous three years. Feed back of the public and overwhelming response from the print and electronic media aided CTP (LHR) in evaluating the success of their change in culture. Surveys from TW showed that employees generally understood the goals of the organization and what was expected of them. Despite some instances of resistance and opposition to change, surveys and feedback seem to indicate general increases in communication, employee participation and as a whole an acceptance of the change in culture.

LIMITATIONS

As this is an exploratory study so findings of this case study could not be useful for decision making but they can be helpful for evaluating OD in CTP(LHR) by providing significant insight into major problem areas. Secondly these findings could not be extended to larger population thinking that OD in CTP (LHR) was hundred percent successful because these qualitative research findings are not statistically tested to know their significance. Future in depth is recommended to have complete insight of this process so that this OD process could be extended to all police department to increase its efficiency.

RECOMMENDATIONS

Besides all these development efforts taken by Government still there are some flaws and lacunas present which if not removed or taken care will lead to more complicated and problematic situations. Some recommendations after conducting this research for CTP (LHR) are:

- No career path is given to these TW's. Because the inspectors, DSP's, SSP's, DIG, they all come from the Punjab Police. These traffic wardens are freshly recruited just for the purpose of handling traffic. What is their career growth? Lack of career planning is creating dissatisfactions among these wardens. If they perform well in their fields, there is no benefit for them because in hierarchical structure there is no room for their promotion.
- There should be proper compensation plan for these TW's. In this critical and emergency situation prevalent in our country, these TW's are the prime target of those suicide bombers. (*10 TW's were martyred during suicide attack on Sri Lankan cricket team in Lahore*)
- Government should build proper infrastructure of roads and also develop urban transport system which would definitely help to reduce this havoc of traffic on Lahore's roads.
- Traffic awareness should be the part of curriculum from early childhood schooling.
- Effective traffic laws should be made covering cyclists, animal drawn carts, hand pushed carts and pedestrians so that their violations could also be penalized.
- Special driving training schools should be established under government sector to have proper check on their performance. In short, CTP (LHR) has done a lot to improve its infrastructure but to be competitive and respond to this heavy flow of traffic in Lahore, they still have to go a long way.

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[4] Information in the table is taken from CTP (LHR) Education Wing.
[5] Information in the table is taken from CTP (LHR) Education Wing.

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APPENDIX

APPENDIX 1: DETAILS OF FOCUS GROUP DISCUSSION

Where discussion was conducted	Participants	Men	Women
DIG(CTP Lahore) office	4	3	1
DSP(Gulberg) office	8	7	1
CTP(LHR) Education Wing	5	4	1

Details of telephonic interview:

1. *Interview with SP (City) Lahore.*
2. *Inspectors CTP(LHR)*   *(10)*
3. *PRO-DIG (CTP, LHR)*

Details of Unstructured Interviews:

Interviews were conducted from 50 TW's based on convenience sampling.

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THE RESPONSIBILITY OF THE AUDITOR ABOUT DISCOVERING FRAUD THE FINANCIAL STATEMENTS ACCORDING TO THE IAS. NO. 240

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ABSTRACT

This study aimed to show the extent and clarity of responsibility of the external auditor for detecting fraud in financial statements under the versions of the professional and the statement of the adequacy of audit procedures contained ISA number (240) in the discovery of fraud in the financial statements and to identify factors to help reduce the vulnerability of the auditor of disputes judicial because of the discovery of the fraud in the financial statements, has been applied to study in Jordan, and to achieve the objective a questionnaire was designed and distributed to auditors practicing and working in the offices of the audit and that audit the accounts of public shareholding companies listed on the Amman Financial Market. The study concluded that there is a reasonable understanding of Auditors in Jordan over responsibility for the discovery of the fraud when auditing the financial statements and the auditors Jordanian application of the procedures contained in ISA 240 increases the ability to detect fraud when auditing the financial statements, and that the most important factors that contribute in reducing the risk of the auditor of the lawsuits is to establish standards of quality control a high level when the task of checking and making sure.

KEYWORDS

audit, international auditing standards, fraud in an audit. ISA No. (240).

INTRODUCTION

The topic of responsibility of the auditor for detecting fraud in the financial statements of the most controversial issues and debate in the literature of the audit, although the reason for this, due to the existence of a gap between the auditing profession and users of financial statements concerning the responsibility of the auditor for detecting fraud and errors in the financial statements, Statements Financial users expect the external auditor to discover all cases of fraud in financial statements, as demanding the auditor to provide assurance never was free of financial statements which were audited all cases of fraud and mistakes or to work on the discovery and disclosure in the case of its existence, while the auditing profession rejects responsibility absolute detection of all cases of fraud.

Years have witnessed the recent lawsuits against auditing firms Great for failing to detect cases of misleading material, where the giving reports clean on the work of a number of companies that have audited the accounts, but soon hit those companies go bankrupt after receiving the audit reports clean which raised many questions and debate about the extent of the auditor's responsibility for the discovery of deception in the financial statements. As a result of the change in the direction of public opinion to the public to resort to the judicial authorities to resolve all cases of conflict and discord (Tomas, Henky , 1998).

Even keep pace with the needs of society is a kind of challenge for each of the researchers in this area and for practitioners of this profession, because this problem they face in exercising their business and require a foundation of scientific and practical solutions to deal with.

So comes this study was to shed light on previous versions of the professional on the subject of fraud and the auditor's responsibility towards it, especially the ISA number (240) (which provides for (The Auditor's Responsibilities Relating to Fraud in an Audit of Financial Statements), which was considered effective for operations Audit of Financial Statements for the periods in which the primitive December 15, 2004 or thereafter. Which came as an amendment to the same standard, which was provided to (the auditor's responsibility to consider fraud in audits of financial statements) as well as identify the factors affecting the discovery of deception in the financial reports and the auditor's responsibility to catch it, perhaps contributing to the development of some of the proposals to guide by practitioners.

STUDY PROBLEM

Problem of the study lies in the lack of clarity of responsibility of the external auditor regarding the discovery of the fraud and misunderstanding about this responsibility has, therefore, highlights the problem of the study through the following questions:
1. Is the auditor responsible for detecting fraud in financial statements?
2. Does the implementation of audit procedures contained in the ISA number (240) to the discovery of the fraud?
3. What are the factors that reduce the risk of the auditor's responsibility for judicial or legal because of the discovery of the fraud?

STUDY OBJECTIVES

The study aims to achieve several objectives can be viewed in the following points:
1. Indicate the extent and clarity of the external auditor's responsibility for detecting fraud in financial statements under the professional versions.
2. Statement of the adequacy of audit procedures contained ISA number (240) in the discovery of fraud in the financial statements.
3. Identify the factors to help reduce the vulnerability of the auditor of disputes because of the lack of judicial discovery of the fraud in the financial statements.

STUDY HYPOTHESES

H1: Is not the external auditor responsible for the discovery of the fraud when he performed an audit.
H2: Do not lead the implementation of audit procedures contained in the ISA number (240) to increase the ability to detect fraud in the financial statements.
H3: there are no factors that reduce the risk of exposure time auditor of the responsibility of the judiciary and legal due to the discovery of fraud in the financial statements.

THEORETICAL FRAMEWORK

THE CONCEPT OF FRAUD TYPES AND CAUSES

Clear from the survey conducted in the United States of America in 1974 to 66% of investors believe that the most important function for companies and accounting firms is the discovery of the fraud. In a study (Humphrey and his colleagues) found that 43% of the accountants, and 60% of Chartered Accountants, 62 % of financial managers believe that it is the duty of the auditor fraud detection is important. While the ratio in favor of this view in the sample of users of financial statements of others, represented investors, bankers and financial journalists, stood at 86%. The following researchers on this result by saying that "the subject of fraud under stressful to the heart through the years, and in more than a discussion of the expectation gap" (Ahmed, 2009).

In a study of Porter pointed out that 91% of Chartered Accountants, and 99% of the relevant officials of the companies that are audited, and 98% of the users of financial statements are specialists in financial matters, they assert that the task of Chartered Accountants, which must be performed, is the discovery of

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deliberate distortion of information Finance. Also see that the functions of the auditor, which must be performed as well as the reservation in the audit report for the deliberate distortion of financial information and by a total of 76% (Porter, 1993).

THE NATURE AND CHARACTERISTICS OF FRAUD

The definition of the error:

According to ISA 240, paragraph (5) of the International Federation of Accountants IFAC as distortions unintended in the financial statements, including the deletion of an amount or clarification, such as an error in data collection or processing, or accounting estimate is correct the result of forgetfulness or an erroneous interpretation of the facts, or an error in the application of accounting principles relating to measurement, recognition, classification, display or disclosure of (IFAC, 2007).

TYPES OF ERRORS

Can be divided into errors of commission in order to hand (ACEF, 2002):

1. Intentional errors, the errors that are made with pre-measure in order to conceal the fact that certain specific and cover the embezzlement.

2. Unintentional errors are errors committed by accident and there is no measure to do, and result from ignorance of accounting principles or default.

The terms of accounting can be divided into:

1. Errors of omission and this may be:

• omitted altogether, such as failure to establish fully operational in the books.

• Inadvertently in part, intended that a party of the process has not been proven in the accounts.

2. Errors of commission and is divided into (Abdullah, 2000):

• Errors of principle and is to identify the processes are not in accordance with accounting principles known.

• Compensating Errors that are commensurate in which the error with another error.

• Clerical Errors are as diverse as wrongful deportation of financial transactions, the errors collection and the IPA and repetition in the proof processes.

TYPES OF FRAUD

Known fraud in paragraph 4 of the International Standard ISA 240 as "an act intended by one or more of the administration, and those charged with oversight, and staff or external parties, in respect of the act by using deception in order to get the interest of unfair or illegal".

Classified according to types of fraud Association of Certified Fraud Examiners (ACFE), which were conducted in the United States of America during the period from April 2001 until February 2002 to three main groups, namely:

1 - Misappropriation of assets.

2 - Corruption.

3 - Misleading financial reports.

Divided by the last study AICPA fraud into three types according to who you are committing as follows:

1. Management Fraud Management fraud is perpetrated by men of senior management and include this type: manipulation in the financial statements or theft of an entity or to use resources for personal purposes.

2. Cheat workers Employee Fraud is perpetrated by workers in operation and includes the theft or use of company resources for personal purposes.

3. External fraud and External Fraud of this type carried out by persons not belonging to the company and includes the theft of company resources or exploited illegally.

And confirm (Arens & lobak 2002) that it is usually difficult to Auditors to discover irregularities compared to errors due to the availability of the intention of misleading when you commit irregularities; on the other hand, the management of fraud are hard to detect because:

1. Possible to penetrate a member of the department, or more internal control.

2. Is usually the effort of the administration to hide the distortion.

THE METHOD AND PROCEDURES AND TEST HYPOTHESES

Study was applied vs. Jordan specifically late 2010 This is a field of study and achieve their goals, the researchers designed a questionnaire on three main axes can be stated as follows:

1. Axis I: contains (10) items related to the extent of the responsibility of the auditor for detecting fraud.

2. Axis II: This included the axis (24) item on the actions that must be performed by the auditor to detect fraud.

3. Axis III: contains (12) item on the factors that reduce the risk of the auditor of judicial disputes.

DESCRIPTION OF THE SOCIETY AND THE STUDY SAMPLE

The study population consists and appointed the statutory auditors Jordanian practicing and who hold a certificate to practice the profession of auditing, where it reached 185 Auditors working on (40) Auditing company of distributors at different regions of the Kingdom The study aimed at the entire population of the study, were taken of the study in full where distribution of questionnaires, one for each of Auditing company of those offices, analyzed 31 questionnaires by 77.5%.

STATISTICAL METHODS USED IN DATA PROCESSING

1. The arithmetic mean, Standard deviation and Percentage:

2. Stability testing tool (Reliability Test): Test was used to measure the Cronbach Alpha reliability of the survey and the amount of internal consistency to them. The results of the calculation of this factor to the stability of paragraphs were too high where it reached 83%, which confirms the reliability of the questionnaire in hypothesis testing (Sekaran, 2003).

3. T- test for single sample (One Sample T-Test):

DATA ANALYSIS AND HYPOTHESIS TESTING

TABLE 1: DESCRIPTIVE STATISTICS FOR THE PARAGRAPHS OF THE AXIS ON THE SCOPE OF RESPONSIBILITY OF THE AUDITOR FOR THE DISCOVERY OF DECEPTION IN THE FINANCIAL STATEMENTS

S. No	range	Statement	Mean	St. Deviation
10	1	The management of the facility is responsible for detecting fraud and error.	*4.64*	*0.68*
1	2	Bear the auditor's responsibility to detect fraud material.	*4.08*	*1.04*
7	3	The auditor is responsible for the actions of the individuals responsible for them in the audit process.	*3.70*	*0.75*
6	4	The auditor is responsible for assessing the capacity of the facility replaces the audit to continue in the activity.	*3.58*	*0.61*
8	5	The auditor is liable to the company that the audited accounts for the compensation of the damage and loss of profits achieved because of the mistakes committed in the implementation of the work.	*3.58*	*1.01*
9	6	The auditor is liable to the shareholders and users of financial statements for the compensation of the damage and loss of profits achieved because of the mistakes committed in the implementation of the work.	*3.58*	*0.59*
5	7	The auditor is responsible for the discovery of illegal acts carried out by the established place of audit.	*3.18*	*0.86*
4	8	If the discovery of the fraud later material is the auditor remiss in carrying out his duties.	*2.39*	*1.02*
2	9	The auditor is responsible for the discovery of the fraud is not material.	*2.37*	*1.07*
3	10	The auditor is responsible for the discovery of the fraud.	*2.21*	*1.03*
General Mean			*3.33*	*0.822*

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AS A RESULT OF TESTING THE FIRST HYPOTHESIS

Ho: Is not the external auditor responsible for the discovery of the fraud when he performed an audit.

Ha: the external auditor is responsible for the discovery of the fraud when he performed an audit.

TABLE NO. 2: T-TEST RESULT FOR THE FIRST HYPOTHESIS

St. Deviation	Mean	Result	] SIG[	Indexed Value of (T)	The Calculated Value of (T)
0.822	*3.33*	*Reject*	*0.01*	*2.042*	*4.95*

Given the table (2) it is clear that the value of T calculated amounted to 4.95 which is larger than the value of indexed, and since the decision rule is: accept the premise nihilism if the calculated value is less than the tabular and rejected if the value is calculated larger than the value spreadsheet, and we therefore reject nihilism hypothesis (Ho) and accept the alternative hypothesis (Ha) This means that the external auditor responsible for the discovery of the fraud when he performed an audit.

TABLE (3): DESCRIPTIVE STATISTICS FOR THE PARAGRAPHS OF THE AXIS ON THE PROCEDURES THAT MUST BE PERFORMED BY THE AUDITOR TO DETECT FRAUD

S. No	range	Statement	Mean	St. Deviation
24	1	Surprise visit to the sites belonging to the unit under scrutiny for the inventory of some assets, such as midwife to the embezzlement of cash and stock.	4.46	0.572
16	2	The discovery of the auditor of fraud leads to narrow the expectations gap in auditing .	4.43	0.688
17	3	The use of analytical procedures at various stages of the audit.	4.37	0.554
5	4	To check the detailed restrictions of the settlement which is made in the last quarter of the year.	4.28	0.688
14	5	Risk assessment of the existence of fraud or error leads to substantial distortions.	4.24	0.663
1	6	Obtain the approvals of the parties that deal with the company such as suppliers, customers and banks.	4.22	1.282
10	7	Exercise professional skepticism when planning the audit process and implementation.	4.20	0.639
21	8	Can check the detailed (comprehensive) for high-risk accounts.	4.17	0.565
23	9	Hire specialists in areas that require it.	4.16	0.776
20	10	Gather information on the conditions of the agreements you make with the company's clients, such as terms of payment and delivery of the goods and the right of reply.	4.14	0.638
22	11	Focus on the audit evidence that is obtained from sources outside the unit under scrutiny.	4.13	0.410
4	12	Evaluate the information that may help in identifying risks of material misstatement due to fraud.	4.13	0.709
15	13	Audit of accounting estimates that may result in material misstatements.	4.12	0.430
3	14	Obtained from the client representation letter acknowledging responsibility for the fair presentation of financial statements.	4.12	0.391
2	15	Assign auditors with sufficient experience and knowledge to audit the accounts of high risk.	4.08	0.625
19	16	The organization of meetings between members of the team process to discuss and understand the physical possibility of distortions to the financial statements resulting from fraud or error	4.08	0.527
8	17	Identify any relationships unusual or unexpected was not normal when performing analytical procedures.	4.01	0.540
7	18	Meeting the management of Internal Audit and Audit Committee in the case of presence	4.00	0.737
13	19	Communication and discussion with the auditors who audit the accounts of subsidiaries or related company to identify risks of material misstatements due to mutual transactions among themselves.	3.99	0.619
18	20	Extensive testing of internal control in terms of design and application.	3.96	0.621
9	21	Inquiry of senior management and the charge of oversight to determine if they have actual knowledge or suspicion of the existence of fraud or material error .	3.89	0.819
11	22	To inspect the records and meetings of the board of directors and audit.	3.79	1.292
12	23	Inquiry lawyer for the company's lawsuits against the company and the estimates for which.	3.12	0.574
24	24	Query management for any fraud or significant error was discovered.	4.46	0.572
General Mean			4.12	0.659

AS A RESULT OF A TEST THE SECOND HYPOTHESIS

HO: does not implement audit procedures contained in the ISA number (240) to increase the ability to detect fraud in the financial statements.

Ha: The implementation of audit procedures contained in the ISA number (240) to increase the ability to detect fraud in the financial statements.

TABLE 4: T-TEST RESULT FOR THE SECOND HYPOTHESIS

St. Deviation	Mean	Result	] SIG[	Indexed Value of (T)	The Calculated Value of (T)
0.659	*4.12*	*Reject*	*0.011*	*2.042*	*20.95*

View table No. (4) it is clear that the value of T calculated amounted to 20.95, the largest of its value indexed, and since the decision rule is: accept the premise nihilism if the calculated value is less than the tabular and rejected if the value is calculated larger than the value spreadsheet, and we therefore reject nihilism hypothesis (Ho) and accept the alternative hypothesis (Ha) This means that it leads the implementation of audit procedures contained in the ISA number (240) to increase the ability to detect fraud in the financial statements.

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TABLE 5: DESCRIPTIVE STATISTICS FOR THE PARAGRAPHS OF THE FOURTH AXIS ON THE FACTORS THAT REDUCE THE RISK OF THE AUDITOR OF JUDICIAL DISPUTES

S. No	range	Statement	Mean	St. Deviation
8	1	Quality control standards at a high level task of the audit.	4.47	0.75
1	2	Ensure the ability to provide the service properly before making a decision to accept the task.	4.12	0.83
12	3	Maintaining independence.	4.08	0.86
11	4	The formulation of rules, laws and standards and constantly revised so as to comply with changing requirements of the audit.	3.97	0.67
9	5	Increase awareness and understanding of the intended users of the auditor's opinion and the extent and nature of his work.	3.96	0.72
10	6	Research in the area of the audit to reach a better ways to discover the fundamental distortions fraud management and staff.	3.96	0.74
2	7	Screening of new clients who have never dealt with them, and in particular with regard to integrity and impartiality of the administration.	3.82	0.65
3	8	Caution in the audits of clients who suffer from difficult financial position.	3.78	0.70
7	9	Increase awareness and understanding of the intended users of the auditor's opinion and the extent and nature of his work.	3.66	0.87
4	10	Agreement with the client on the duties and responsibilities in a letter contract with the task of auditing.	3.57	0.94
5	11	Text explicitly on the borders of the auditor's responsibility in all of the letter of the contract and letter of representation.	3.55	1.02
6	12	Obtain letters of contracting and representation.	3.45	1.21
General Mean			3.87	0.83

AS A RESULT OF TESTING THE THIRD HYPOTHESIS

HO: There are no factors that reduce the risk of exposure time auditor of the responsibility of the judiciary and legal due to the discovery of fraud in the financial statements

Ha: There are factors that reduce the risk of exposure time auditor of the responsibility of the judiciary and legal due to the discovery of fraud in the financial statements.

TABLE 6: T TEST RESULT FOR THE THIRD HYPOTHESIS

St. Deviation	Mean	Result	] SIG[	Indexed Value of (T)	The Calculated Value of (T)
0.83	3.87	Reject	0.000	2.042	12.92

View table No. (6) it is clear that the value of T calculated amounted to 12.92, the largest of its value indexed, and since the decision rule is: accept the premise nihilism if the calculated value is less than the tabular and rejected if the value is calculated larger than the value spreadsheet, and we therefore reject nihilism hypothesis (Ho) and accept the alternative hypothesis (Ha) This means that there are factors that reduce the risk of exposure time auditor of the responsibility of the judiciary and legal due to the discovery of fraud in the financial statements.

CONCLUSIONS AND RECOMMENDATIONS

THE RESULTS

Field study results and the following indicators:

1 - That there is a reasonable understanding of Auditors in Jordan over responsibility for the discovery of the fraud when auditing the financial statements, where the mean was 3.33 year and by 66.6% support.

2 - statistical analysis showed that the auditors Jordanian application of the procedures contained in ISA 240 increases the ability to detect fraud when auditing the financial statements where it reached the mean year 4.12 per support amounted to 82.4% and the most important actions that must be adhered to by auditors surprise visit sites belonging to the unit under scrutiny for the inventory of some assets, such as midwife for embezzlement of cash and stock, and the discovery of the auditor of fraud leads to narrow the expectations gap in the audit.

3 - There are a range of factors that contribute to reducing the risk of the auditor of the litigation, as was the arithmetic mean of 3.87, a rate of support reached 77.4%, and most notably the development of standards of quality control a high level when the task of checking and ensuring the ability to provide the service properly before making a decision to accept task.

RECOMMENDATIONS

Based on the results reached in this study, the researcher recommends the following:

1 - the need for the Jordanian Society of Chartered Accountants of organizing seminars, conferences and training courses for its members to ensure the development of their skills and update their knowledge of the discovery of the fraud in the light of the recommendations issued by the organizations, publications, relevant standards audited accounts.

2 - the obligation of auditors Jordanian application of the procedures contained in ISA 240 in particular and the international auditing standards generally.

3 - the need for the auditors of Jordanians to take measures that contribute to reducing the risk of exposure to lawsuits and judicial review of legislation for the Jordanian legal audit profession in order to avoid deficiencies in the organization of the profession on the one hand and to keep abreast of developments and updates to the international auditing standards on the other hand.

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A PERCEPTUAL STUDY ON THE CRITICAL SUCCESS FACTORS FOR ERP ADOPTION IN THE SMALL AND MEDIUM ENTERPRISES

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ABSTRACT

Adoption of Enterprise Resource Planning (ERP) can be said as one of the major strategic initiatives of today's organization particularly in a Small and Medium Enterprise (SMEs). This paper presents the approach, analysis and findings of a pilot study conducted for ERP Adoption in select SMEs in India. This paper analyzes the respondents' ranking on certain critical success factors (CSFs) for ERP Adoption. The CSFs identified from previous research studies conducted all over the world on ERP for SMEs were tested practically on a set of sample of SMEs in India. These CSFs were categorized into different phases of ERP Adoption, namely planning, acquisition, implementation, usage and percolation and extension. The SMEs forming part of the sample were operating in automobile-component industry in India and this is a pilot study conducted as a partial fulfillment of the on-going broader research.

KEYWORDS

Acquisition, CSFs, ERP, Extension, Implementation, Planning, SMEs, Usage & Percolation.

INTRODUCTION

The adoption of Enterprise Resource Planning (ERP) by Small and Medium Enterprises (SMEs) has created wide-spread interest for researchers in the academic world. Interestingly two different perspectives exist, one, from the organizational maturity perspective and the other from the ERP maturity perspective. While the organizational maturity explains the SMEs' readiness to adopt ERP for their business process integration, the concept of ERP itself has matured from being product-centric to service-centric. Since the 1980s many researchers both from the academia and industry have shown keen interest in tracking the adoption of Enterprise Resource Planning (ERP) for SMEs due to some of the limitations faced by SMEs in terms of resources namely financial, technological, intellectual etc (Rao, 2000). ERP adoption has been accepted as one of the popular innovative developments related to the information technology industry (Al-Mashari 2002).

The Indian Industry comprises of many Small and Medium Enterprises (SMEs) in various segments or clusters which are influenced by Enterprise Resource Planning adoption. However, the SMEs are constrained by size in terms of finance and business resources and they are hesitant and skeptical towards embracing information technology as a driver for growth (Dwivedy and Harigunani 2008, Misra 2009). SMEs, moreover, are limited in intellectual capital and supportive manpower to drive the strategic IT initiatives of ERP. Hence considering these factors, ERP adoption for SMEs is a complex process. For instance, the business model of the Indian automobile sector itself could be a major driver for information technology enabled transformation. Automobile manufacturing is predominantly an assembly of thousands of parts that are manufactured by numerous players of different business sizes and in different levels (Tier-I, II, III) depending upon the complexities of the auto-components. These players supply majority of their finished products to the automobile manufacturing company, popularly known as the Original Equipment Manufacturers (OEMs). The OEMs are huge corporation churning out billions of rupees and are equipped with state-of-the-art information technology applications that streamline, integrate and optimize business processes. On the contrary application of information technology is very low in the SME segment. Most of these units are still using manual processes and spread-sheet based IT enablement in their core business processes. The definition of Small and Medium Enterprise generally depends upon certain key factors like number of full-time employees on roll, investment in plant and machinery, sales turnover etc. For the purpose of understanding, some select definitions are given below.

The Reserve Bank of India defines SME, as an undertaking in which investment in plant and machinery does not exceed Rs.1 crore (INR 10 millions), except in respect of certain specified items under hosiery, hand tools, drugs and pharmaceuticals, stationery items and sports goods, where this investment limit has been enhanced to Rs. 5 crore. Units with investment in plant and machinery in excess of SSI limit and up to Rs. 10 crore may be treated as Medium Enterprises-ME, (RPCD Circular No. RPCD.PLFNS.BC. 31/ 06.02.31/ 2005-06 dated August 19, 2005). The Small Industries Development Bank of India (SIDBI) defined SMEs in the manufacturing sector as those units whose investment in plant and machinery (original cost excluding land and building and the items specified by Ministry of MSME, the Ministry of Small Scale Industries, vide its notification No. S. O. 1722 (E) dated October 5, 2006) for micro enterprises does not exceed Rs. 25 lakh (INR 2.5 millions), while small enterprises have investment more than Rs. 25 lakh but does not exceed Rs. 5 crore and medium enterprises more than Rs. 5 crore but does not exceed Rs. 10 crore.

From its evolution as a mere inventory control package in the 1960s ERP today has been accepted as a driver of operational efficiency and growth of business (Pasha, 2007). ERP systems are always looked upon as large and complex systems and often called for fundamental changes in the current working of an organization. The foundation of the organizational core processes are re-laid during the process of an ERP implementation which affects the reporting and decision-making processes (Holsapple and Sena, 2005). Organizations that implement ERP expect productivity improvements, competitive advantage and meeting customer demands as key business drivers (Scott and Shepherd, 2002).

The market for ERP solutions have also evolved and matured both in terms of product and service offering. The maturity is seen in the technology by which the software and hardware infrastructure is developed and deployed. Over the last 10 years the financial perception of ERP solutions have also started to change from a capital expenditure perspective to an operational expenditure perspective due to the change in the offering of ERP solutions from an on-premise to on-demand mode. The result is that there is a general awareness amongst the organizations particularly the SMEs that ERP is less costly to adopt than what it were earlier (Aberdeen 2006).

ERP adoption by small and midsize businesses can be approached from the perspective of applying certain well defined critical success factors (CSFs) keeping in mind the diverse range of adoption issues and constraints relating to finance, technology and manpower availability (Rao 2000).

This research paper examines certain pre-defined CSFs for ERP adoption in SMEs identified from past researches and tests its practical relevance by means of a survey. The respondents' ranking on certain critical success factors (CSFs) for ERP Adoption was analyzed in this paper. These CSFs were identified from previous research studies conducted worldwide on ERP for SMEs and were ranked by the authors in their previous study. These CSFs were categorized into different

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phases of ERP Adoption, namely planning, acquisition, implementation, usage and percolation and extension. The respondents involved in this study were SMEs operating in automobile-component industry in India and is a pilot project conducted as a part of the on-going research.

This research paper is divided into five sections. The next section i.e., Section Two discusses the relevant literature review. Section Three explains the objectives and methodology of research study and justifies the need of the current study. Section Four presents the analysis and findings from the study. Section Five presents the conclusion and the scope for future work in this direction.

LITERATURE REVIEW

Organizations are increasingly realizing the need to improve the efficiency of information flow between functional departments in order to stay competitive internally and externally. ERP adoption by SMEs has gained more attention and popularity due to near-saturation of ERP adoptions in large enterprises. Macro and micro economic factors like globalization, partnerships, value networks, and huge information flow across and within SMEs today have also driven SMEs towards adopting ERP systems. SMEs are left to face risks of adoption because they have limited resources and specific characteristics that make their case different from their larger counterparts (Haddara and Zach, 2011). The design of ERP system enables fragmented departments to integrate with each other and streamline operational processes (Koch, 2003).

Six different stages for adoption and system acquisition decision in the ERP system life cycle, namely a) Adoption decision, b) Acquisition, c) Implementation, d) Use and maintenance, e) Evolution and f) Retirement was proposed (Esteves and Pastor, 1999) . Certain select factors relevant to the ERP implementation context to small organizations were specified (Gable and Stewart, 1999). A methodical approach to the acquisition of ERP solutions by SMEs was proposed (Sistach *et.al.* 1999). Another preliminary empirical study of the diffusion of ERP systems in Austrian and British SMEs presented the work-in-progress of an international research project wherein, the focus was on the early stages of making the adoption decision, there after evaluating and selecting an ERP (Tang and Bernroider 2003). Their study attempted to close some of the identified gaps in ERP research with an objective to link the results of the early stages of decision-making to implementation, usage and evolution success. Their study was restricted to the case of ERP software, but also provided insights into the potential of integrating ERP and other important applications like CRM and SCM.

The relationship of enterprise size to the constraints and objectives of ERP was investigated (Laukkanen *et al.* 2005). Their survey data was based on forty four companies and revealed that significant differences existed between small, medium-sized and large enterprises in the adoption of ERP system. The authors found that smaller companies experience bigger knowledge constraints than their larger counterparts in ERP adoption. An overview on the critical success factors across different stages of ERP life cycle for SMEs was presented (Niclas and Marcus 2005). The organizational effectiveness due to adoption of ERP functions and the related CSFs were analyzed (Juell-Skielse 2006). The ex-post evaluation of success factors of ERP in SMEs found that the introduction of ERPs into SMEs cannot be on a sheer reproduction of the experiences with larger companies and represent a new challenge with significant uniqueness to be addressed (Tommaso, 2007). His research was specifically targeted to the SMEs, which already completed the process of adopting an ERP system. The objective was evaluation of these experiences ex-post by examining some improvement indicators associated with the ERP project. A Unified Theory on CSFs for ERP adoption in SMEs was established with five decision areas namely Planning, Acquisition, Implementation, Usage and Percolation and Extension within which a set of 39 critical success factors were identified. (Bharathi, Parikh, 2009). CSFs for ERP implementation in SMEs were categorized into six categories namely vision, scope and goals, culture, communication and support; infrastructure; approach and project management. Some of their key findings amongst others were related to vision and strategic goals of the ERP implementation, senior management support, active user involvement, culture, internal communication, project approach and methodology and a proper mix of users in the project team (Doom and Milis 2009).

Some researchers have also criticized the CSF approach because they felt that the perception of respondents depended upon certain section of stakeholders only which lead to response bias (Davis, 1980). The need for clear identification of the respondent group and a method for identifying the information requirements was suggested (Munro and Wheeler, 1980). Another research suggested that a cross-section of management be interviewed, so that all levels and different process owners would be incorporated (Boynton & Zmud, 1980).

OBJECTIVE AND METHODOLOGY OF THE STUDY

The objective of this study was to find the overall perception of respondents on the selected CSFs in each of the five stages of ERP adoption namely planning, acquisition, implementation, usage and percolation and extension.

For the purpose of accomplishing this objective, five small and medium enterprises engaged in the business of automotive ancillaries were chosen as sample units for the study. All these units were situated in Pune which is one of the major automobile hubs in India. These units supplied a variety of automobile components to the various OEMs (Original Equipments Manufacturers) situated in and around Pune. This research paper is conceptual as well as empirical. For the concept building, the authors extensively relied on secondary data that contained tested and proven knowledge in this area from already conducted and published research studies from all over the world. Using the conceptual understanding the empirical study was conducted on these five SMEs based on a structured questionnaire.

The questionnaire was circulated to certain key process owners of these units namely the departmental heads of Information Technology, Production Planning and Sales. Few heads were also interviewed on the ERP culture in the organization. The questionnaire contained a set of 30 CSFs segmented into five phases of ERP adoption apart from some general questions relating to type and nature of the enterprise, business operations, business age, type and age of ERP, number of users etc. These CSFs were identified from various research studies from India and rest of the world. The respondents were solicited to rank the CSFs in each of the phases of ERP adoption based on their experiential perception. These ranks were then analyzed to test the solidarity of their perception.

The limitations of the study could be the less number of sample units chosen as the results or outcome may not be eligible for generalization of the whole population. Moreover, though responses were solicited from multiple process owners, the analysis of their perception was done collectively and the differences between them were not studied due to lack of responses and data completeness.

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ANALYSIS AND FINDINGS OF THE STUDY

The profile and relevant basic details of the sample units are presented in the table below.

TABLE 1

Basic Details	SME 1	SME 2	SME 3	SME 4	SME 5
Type of the organization	Medium	Medium	Medium	Small	Medium
No. of Years in Business	>20	>15	>20	>10	>20
No. of Employees	100-150	100-150	150-200	50-100	100-150
ERP in place currently	Yes	Yes	Yes	Yes	Yes
No. of Years since ERP	6	1	4	3	7
Implementation Time (in months)	7	12	5	5	6
Core Functions targeted in ERP	Inventory, Production, Procurement	Production, Procurement, Sales, HR	Inventory, Production, Procurement & Sales, Logistics	Accounts, Production, Procurement	Inventory, Production, Procurement
Nature of Business	Manufacturing, Subcontracting	Manufacturing	Manufacturing, Subcontracting	Manufacturing	Manufacturing
Systems in place before ERP	Yes (Tally)	Yes (Tally)	Yes (Tally)	Yes (Tally)	Yes (Tally)
Type of ERP Product used	Branded	Branded	Branded	Un-Branded	Branded
Functions in Use in ERP	Inventory, Production, Procurement	Billing & Production Planning	Inventory, Production, Procurement, Sales, Logistics	Production, Procurement	Inventory, Production, Procurement
Type of ERP	On-Premise	On-Premise	On-Premise	On-Premise	On-Premise
ERP Investment (Millions of Rs.)	NA	1.5(approx)	NA	NA	NA
No. of daily routine Users	20-25	10-15	20-25	10-15	10-15

The above table presents some interesting observations prima facie. All the five units had been using ERP for their operational routine. Prior to adopting ERP all the units had used information systems primarily to capture their accounting transactions mainly to conduct their accounting cycle (journalizing to reporting). All the units used ERP to mainly carry out certain core processes in production, inventory, and procurement functions. SME 1, 3, 5 were more than 20 years old while 2 was over 15 years old and 4 was over 10 years of old in business. However, the organizations had differed widely in their ERP age, i.e., number of years since ERP was adopted. The unit's ERP adoption age can be compared to the units' business age to find out seniority in the adoption of ERP. It is found that SME 4 adopted ERP after seven years (10-3) of its existence in the business while the other units took much longer period to adopt ERP viz., SME 1 twelve years, SME 2 fourteen years, SME 3 sixteen years and SME 5 thirteen years.

The following section exhibits and explains the respondents' ranking of CSFs in each of the five decision phases of ERP Adoption. The outcome of the following analysis will justify the objective of the paper by analyzing the ranks given by the respondents on the CSFs. The ranks assigned by the respondents in all the five SMEs were consolidated and averaged to calculate the final ranks. The overall association of the respondents' ranking was also studied using Kendall's Coefficient of Concordance. In other words this test was conducted to find out whether there exists any common consensus between the respondents' perception on the ranking of the CSFs in each of the five phases of ERP adoption.

ANALYSIS AND FINDINGS ON RESPONDENTS' RANKING OF CSFs IN PLANNING PHASE

The Respondents' Ranking on CSFs relating to Planning Phase is given in the table below.

TABLE 2

Critical Success Factor	SME 1	SME 2	SME 3	SME 4	SME 5	Mean
Owner's (Proprietor / Partners/ Director) commitment	1	1	2	3	1	1.6
SME culture (maturity) in terms of receptiveness to change	4	2	1	1	2	2
SME Vision and growth perspective	2	3	3	2	5	3
Project Planning and Scheduling	5	4	4	4	3	4
Goal and Scope of ERP	3	5	5	4	4	4.2

The rankings are summarized below

TABLE 2 A

Critical Success Factor	Rank
Owner's (Proprietor/Partners/ Director) commitment	1
SME culture (maturity) in terms of receptiveness to change	2
SME Vision and growth perspective	3
Project Planning and Scheduling	4
Goal and Scope of ERP	5

From the above table it is found that proprietor/partners' commitment is ranked as most important over the other factors. In the planning phase the lowest sum of ranks has been found for the CSF "Owner's (Proprietor/Partners/ Director) commitment" which means that all the respondents place this as the first and foremost CSF. It was commonly found that irrespective of the adoption stages, the involvement of top management has been perceived as critical to the success of ERP adoption by the all the sample units. The respondents believed that the top management commitment is very crucial to the success of ERP adoption. They also felt that consistency and visibility of such commitment should be seen in all the stages of ERP adoption. Commitment is defined as the top management's belief, involvement, support, motivation and appreciation to accept ERP system as a driver for business growth. Such commitment was perceived to be significant in defining the SME's vision and growth in the long-run. The respondents perceived that such commitment should be translated and visible in every stage of ERP adoption.

The overall association of the respondents' ranking for the CSFs in the Planning Phase is presented below.

Null Hypothesis: There is no significant agreement in the rankings assigned by the respondents' for the selected CSFs.

s	38.44	46.24	23.04	0.04	27.04	134.8
	250				W=	0.5392
Critical Value	K=5	N=5	0.449	Reject		

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ANALYSIS AND FINDINGS ON RESPONDENTS' RANKING OF CSFs IN ACQUISITION PHASE

In the table given below the Respondents' Ranking on CSFs relating to Acquisition phase is presented.

TABLE 3

Critical Success Factor	SME 1	SME 2	SME 3	SME 4	SME 5	Mean
Cost Benefit Analysis	1	3	2	1	4	2.2
Software package selection, evaluation	4	2	3	2	1	2.4
Existing IT compatibility of the SMEs	3	6	1	3	2	3
Role of consultant	2	5	4	6	3	4
SMEs Process Owners' interaction	6	1	6	5	5	4.6
Implementation Vendor Analysis	5	4	5	4	6	4.8

The rankings are summarized below

TABLE 3 A

Critical Success Factor	Rank
Cost Benefit Analysis	1
Software package selection, evaluation	2
Existing IT compatibility of the SMEs	3
Role of consultant	4
SMEs Process Owners' interaction	5
Implementation Vendor Analysis	6

From the above table it is found that cost-benefit analysis is ranked as most important over the other factors. Cost-benefit analysis is defined as the relationship between expected savings and the costs associated with ERP adoption like consulting, package, implementation, migration, upgrades, training and support etc. Cost Benefit Analysis calls for a lot of participation by the owner(s) or partners of the SMEs in convincing about the initial investment and the latent/future benefits of ERP.

Amongst other factors, analyzing the existing IT infrastructure needs a special mention because these units are limited by size and scale of operations; hence they are not capital intensive. So a careful study of the status of working of the existing hardware and IT application should be done. It would be much beneficial because SMEs can afford to spend capital expenditure on an incremental perspective instead. It is imperative to reconcile existing IT infrastructure so that it becomes easier to make the right choice of the product, selection of implementation and knowledge (consultant) partner etc. One of the respondents SME4 had separate software application running for accounting and another for production planning (generated Master Production Schedule on a weekly basis). This company using a third-party vendor integrated the existing transaction processing applications by adding procurement and inventory functionality to create an ERP system for themselves.

The overall association of the respondents' ranking for the CSFs in the Acquisition Phase is presented below.

Null Hypothesis: There is no significant agreement in the rankings assigned by the respondents' for the selected CSFs.

s	90.25	30.25	42.25	20.25	42.25	42.25	267.5
	437.5					W=	0.611429
Critical Value	K=5	N=6	0.417	Reject			

ANALYSIS AND FINDINGS ON RESPONDENTS' RANKING OF CSFs IN IMPLEMENTATION PHASE

The Respondents' Ranking on CSFs relating to Implementation phase is presented in the table given below.

TABLE 4

Critical Success Factor	SME 1	SME 2	SME 3	SME 4	SME 5	Mean
Involvement of Process Owners	2	1	1	1	1	1.2
Identification of mission critical functions/ processes	4	2	4	3	2	3
Project Management	1	3	6	4	3	3.4
Configuration vs. Customization (Gap Analysis)	5	7	2	2	5	4.2
Implementation road map & Methodology	3	6	5	5	4	4.6
Training needs identification	6	5	3	7	7	5.6
Functional Testing	7	4	7	6	6	6

The rankings are summarized below

TABLE 4 A

Critical Success Factor	Rank
Involvement of Process Owners	1
Identification of mission critical functions/processes	2
Project Management	3
Configuration vs. Customization (Gap Analysis)	4
Implementation road map & Methodology	5
Training needs identification	6
Functional Testing	7

In the implementation phase the lowest sum of ranks has been found for the CSF "Involvement of Process Owners" which means all the respondents place this as the top most CSF. It was ranked first amongst the chosen seven CSFs because the extent of involvement of certain key process owners during implementation and testing phase can ensure timely reinforcement of project objectives and reduce the gap between expectations and deliverables. In the Implementation phase, the top management was expected to empower the process owners of core processes to involve themselves in ERP implementation which usually relies on additional time and effort from such functional heads.

It was perceived by the respondents that process owners particularly from the accounting, production and purchase departments would foster involvement in the ERP initiative and can accelerate faster buy-in from the appropriate user-group in such departments. However, the SMEs do not have abundant manpower, some of which does not even have a full-fledged IT department. Involvement of process owner is a challenging task because the process owners are full-time busy involving themselves in their departmental routine and at times they perform cross-functional activities.

The overall association of the respondents' ranking for the CSFs in the Implementation Phase is presented below.

Null Hypothesis: There is no significant agreement in the rankings assigned by the respondents' for the selected CSFs.

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s		9	9	25	4		196	169	64	476
		700							W=0.68	
Critical Value	K=5	N=7	0.395	Reject						

ANALYSIS AND FINDINGS ON RESPONDENTS' RANKING OF CSFs IN USAGE AND PERCOLATION PHASE

The CSFs relating to the Usage and Percolation Phase are ranked by the Respondents' in the table given below.

TABLE 5

Critical Success Factor	SME 1	SME 2	SME 3	SME 4	SME 5	Mean
Percolation of owner's commitment	1	1	1	2	2	1.4
Periodical and timely communication	3	2	3	1	1	2
Feedback on user satisfaction	4	5	2	4	3	3.6
Periodical review on implications on time, cost and benefits	5	3	4	3	4	3.8
Gap Analysis before and after training	2	6	6	4	5	4.6
Mandatory ERP environment	6	4	5	6	6	5.4

The rankings are summarized below

TABLE 5A

Critical Success Factor	Rank
Percolation of owner's commitment	1
Periodical and timely communication	2
Feedback on user satisfaction	3
Periodical review on implications on time, cost and benefits	4
Gap Analysis before and after training	5
Mandatory ERP environment	6

It was found that Percolation of Owner's Commitment was ranked first from amongst the CSFs relevant in this phase because the respondents believed it will instill confidence in the users of the ERP system and will enable faster percolation of ERP-enabled working in the SME. Amongst other factors, the respondents emphasized that the IT department should clearly mention the timely updates on the progress of ERP implementation so that the functional departments can also plan their preparedness to use the ERP. The respondents also felt that feedbacks should be solicited from key users of each department on working in the ERP system. This will enhance confidence in the users to acclimatize to the ERP routine and also indicate problem areas if any where support and training can be arranged proactively than being reactive.

The overall association of respondents' ranking for CSFs in the Usage and Percolation Phase is presented below.

Null Hypothesis: There is no significant agreement in the rankings assigned by the respondents' for the selected CSFs.

s		0.4444	53.7777778	106.7778	93.4444444	0.444444	44.44444	299.3333
		437.5					W=	0.68419
Critical Value	K=5	N=6	0.417	Reject				

ANALYSIS AND FINDINGS ON RESPONDENTS' RANKING OF CSFs IN EXTENSION PHASE

In table given below the Respondents' Ranking on CSFs relating to Extension phase is presented.

TABLE 6

Critical Success Factor	SME 1	SME 2	SME 3	SME 4	SME 5	Mean
ERP working culture in the SME	1	2	1	2	3	1.8
Extent of process standardization	3	1	4	1	1	2
Business relationship with OEM	2	4	2	3	2	2.6
Role in demand and material planning	5	3	3	4	4	3.8
Identification of processes extended interface	4	6	5	6	5	5.2
Analysis of additional IT infrastructure	6	5	6	5	6	5.6

The rankings are summarized below

TABLE 6 A

Critical Success Factor	Rank
ERP working culture in the SME	1
Extent of process standardization	2
Business relationship with OEM	3
Role in demand and material planning	4
Identification of processes extended interface	5
Analysis of additional IT infrastructure	6

From the table it can be found that ERP enabled working culture was ranked first from amongst the other relevant CSFs by the respondents, because the respondents felt this factor is critical for ensuring process efficiency and the SME's readiness to support integration of external processes with its larger counterparts. Business relationship with OEMs was perceived with high rank by the respondents for extending the ERP integration. This factor also has a strong bearing with the top management of the SMEs considering the fact that these SMEs were suppliers to the large domestic and international OEMs for more than a decade.

In the Extension Phase too, the respondents perceived that top management can impact an ERP-enabled working culture for ensuring readiness in inter-organizational process integration between their larger customers, i.e., OEMs.

The overall association of the respondents' ranking for the CSFs in the Usage and Percolation Phase is presented below.

Null Hypothesis: There is no significant agreement in the rankings assigned by the respondents' for the selected CSFs.

s		72.25	20.25	2.25	72.25	56.25	110.25	333.5
		437.5				W=	0.762286	
Critical Value	K=5	N=6	0.417	Reject				

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In general it can be observed in all the five phases of adoption there exists significant agreement in the rankings assigned by the respondents' for the selected CSFs.

CONCLUSION AND FUTURE SCOPE OF WORK

This paper has examined the perception of SME respondents on the selected CSFs in each of the five stages of ERP adoption namely planning, acquisition, implementation, usage and percolation and extension. The examination of the perception was made possible by a pilot study conducted on 5 SMEs operating in India belonging to the automobile components industry. This research as said earlier is a part of the on-going broader research in this area and findings of this paper has reinforced the efforts of the authors in the right direction. The overall consensus in respondents' ranking of CSFs has given confidence to expand the sample size because of the uniformity in the perception of SMEs towards ERP adoption. All the SMEs have emphasized the role and involvement of top management (owner(s)/partners/director(s)) in the various stages of ERP adoption. Also this study enables the researches to broaden the sample scope to those SMEs into different categories based on their ERP adoption experience.

This study will also help in sensitizing certain CSFs particularly in the Usage and Percolation and Extension phases of ERP adoption wherein high level of users buy-in and standardization is called for. The findings of this research paper can be tested in other SMEs clusters in various geographies to analyze the similarities and differences in the perceptions of the stakeholders (decision-makers, process owners, users etc). Further this study can be extended to incorporate multiple stake holders as mentioned above and also categorizing the SMEs according to their ERP age (number of years since ERP adoption), the results of which could be more convincingly generalized.

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INFORMATION TECHNOLOGY TOOLS TOWARDS OPTIMIZING ENERGY CONSERVATION AND ENVIRONMENTAL PROTECTION INITIATIVES

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ABSTRACT

Energy companies to stay ahead of the developments have to pay constant attention to building and maintaining their networks and are constantly looking for cost-saving possibilities. This paper attempts to highlight the importance of information technology applications towards optimizing energy conservation and environment protection initiatives. This paper also recommends some areas of effective training and development programs.

KEYWORDS

Energy conservation, school curricula, diversified training program, eco-citizens behavior, and renewable energy technologies.

INTRODUCTION

At present, energy-saving technology is a feasible and an effective way to achieve energy and environmental sustainable development, although renewable energy may be final solution to environmental issues. Information and communications technology is helping for responding to these challenges. The right operational information and knowledge are necessary for making better decisions, and they are also indispensable for increasing production and reducing costs. Geographic information systems support electricity and gas companies business processes in following way:

- integral management of assets and networks (grids)
- planning, design, realization and maintenance of networks
- planning and marketing
- tracking and tracing
- finding gas leaks
- implementation of the company-wide use of geographic information
- integration of GIS and ERP, CRM, SCADA and other IT systems
- restructuring processes and process support using geographic information
- implementation of mobile and Internet solutions

OBJECTIVES OF IMPLEMENTING IT APPLICATIONS

Industry application of GIS solutions offers efficiency and effectiveness for Telecom, Transport, Energy, Financial, Manufacturing or Government sector. GIS services and solutions offer rapid and efficient deployment; substantially lower total cost of ownership and higher levels of ROI. It helps in achieving following objectives:

1. Plan better services and infrastructure through analysis of patterns and trend in spatial information
2. Analyze performance spatially and manage property assets data
3. Identify risks for buildings, improve assessor practices, track stolen vehicles and target customers by locating others in the locality in the Insurance Sector
4. Provide Location Based Services (LBS) to consumers based on cell location, monitor network statistics e.g. coverage conditions, aid customer relations by speedy fault repair and relating customers quickly to affected network in the Telecom Sector
5. Provide access to large volumes of current and historic data e.g. through GIS- enabled document management systems, permit field-based data editing and recording of survey information to streamline the process and make the information more accurate and timely

POSSIBLE AREAS OF DEVELOPMENT

Possible areas and actions for the development of general knowledge programs should include:

1. Developing market mechanisms to connect accessible and affordable capital with energy consumers to enhance the effectiveness of a provincial strategy.
2. Ensuring inefficient, older appliances are taken out of the market, their materials recycled and any toxic components managed.
3. Engaging community organizations, non-governmental organizations and public interests groups in culture change, communication, education and implementation of conservation.
4. Establishing accessible and understandable means of benchmarking energy use, planning and implementing conservation projects, accessing resources and technologies
5. Ensuring publicly funded institutions establish and maintain management reporting systems which cover energy use, costs and savings potential,
6. Facilitating energy auditing and benchmarking of existing buildings and providing access to resources to implement retrofits.
7. Integrating conservation into school curricula; developing curricula to establish the skills, knowledge and behavior of conservation and renewable energy; developing guidelines for relating curriculum to energy efficient design.
8. Increasing conservation related training in colleges, universities and apprenticeship programs to cover all facets of energy management for industry and buildings.
9. Incorporating Energy Guide for Homes ratings in real estate profiles.
10. Organizing seminars, workshops or summer schools for decision makers and experts related to other energy fields.
11. Pursuing strategies for job creation in the manufacture of products and the delivery of services related to conservation and renewable energy; accelerated development of new technologies. Increasing conservation related training to industry.
12. Producing audio-visual materials that illustrate existing solar installations, as well as future prospects for these technologies.
13. Publishing information, in the form of study articles and comprehensive, well documented reports, on solar energy and its prospects.
14. Produce and broadcast programs and documentary films for television.
15. Using web-based systems to allow comparison of energy use with comparable buildings and estimation of potential savings.

LATEST DEVELOPMENTS IN ENERGY CONSERVATION AND ENVIRONMENT PROTECTION INITIATIVES

American Association of State Colleges and Universities (AASCU) highlighting roles of institutions

AASCU devoted its July/August 2006 Public Purpose magazine to cover the issues related to sustainability at public higher education institutions. The issue highlighted role of various institutions implementing sustainability policies on its campuses, in its classrooms and bridging them to the business world.

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Bedford College in Southern England providing training

Bedford College in Southern England is a centre for excellence in green energy, providing training for small businesses in installing and maintaining solar panels, wind turbines and bio-mass technology.

Canadian Industry Program For Energy Conservation (CIPEC) developing comprehensive projects

The Canadian Industry Program for Energy Conservation (CIPEC) with representation of 294 companies, and 24 sector task forces is active in developing comprehensive projects to improve conservation in their municipal operations. Non-governmental organizations are implementing community-wide programs for improving the conservation in existing and new buildings, and at developing integrated, fuel efficient transportation schemes.

Florida Gulf Coast University reducing operating expenses

National Center for Academic Transformation implements effective uses for information technology in order to improve student learning and reduce the cost of higher education. By redesign their coursework schools reduced costs by an average of 37 percent, saving of $3.1 million in operating expenses each year.

Park Lane College in Leeds offering courses on climate change

Park Lane College in Leeds offers a *"reduce your carbon footprint"* course managed by a team of conservation and environmental tutors through practical energy saving techniques, and the science behind climate change.

Texas State Energy Conservation Office (SECO) encouraging energy-efficiency projects

Energy education programs of SECO promote energy conservation and efficiency through education. Over 2,500 teachers have attended these workshops and utilized the materials in their classrooms reaching over 375,000 students.

University of Nîmes in Southern France organizing programs for eco-citizens

University of Nîmes in Southern France, in March 2007, organized a program to promote the behavior of "eco-citizens". Concentrating on the promotion of waste management and economizing on energy use a university wide campaign for providing practical demonstrations of environmental awareness linked to social psychology theory.

Wisconsin Environmental Education Board and The University Of Wisconsin utilizes community resources

K–12 energy education program (KEEP) encourages school-to-career skills and the use of a rich set of community resources including professionals, businesses, environmental organizations, and institutions of higher education. Wisconsin students are now competent enough to cope with difficult decisions about energy and its relationship to environmental, socio-political, and economic issues.

York University encouraging green buildings:

The Computer Sciences Building of York University is an ideal example of a "green" building built at no cost premium. Raising the standards for new buildings and major renovations is the most economical means of conserving energy in new buildings and avoids the lost opportunity cost associated with retrofitting improvements after the building is constructed.

CONCLUSIONS

The Government of India is planning to deploy a Geographic Information System-based mapping of energy-intensive industries and large buildings. The mapping tool is proposed to be interfaced with Google Earth to offer a spatial distribution of the energy-intensive industrial consumers and ensure geographically-referenced data generation for beefing up the energy conservation efforts. GIS and GPS have a significant role in supporting the development and expansion of the renewable energy sector involving biomass, geothermal, solar, wind and hydro/wave types. In GIS environment, geospatial data are better maintained in a standard format, revision and updating, search, analysis and representation of information becomes easier. The information from satellite data interpretation and other descriptive data can be merged into GIS, thus generating a unique database for hydropower project.

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COST REDUCTION INNOVATION IN SME's – AN EMPHERICAL STUDY
(WITH REFERENCE TO HANDLOOM SILK SAREES IN CHIKKABALLAPUR DISTRICT)

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ABSTRACT

The handloom sector forms a precious part of the generational legacy and exemplifies the richness and diversity of our country and the artistry of the weavers. The Handloom sector is the second largest economic activity after agriculture. This sector has been able to withstand competition from the power loom and mill sectors by the effective State intervention through financial assistance and implementation of various developmental and welfare scheme. This paper, analyses the cost reduction possibilities in handloom silk saree manufacturing SME's in Chintamani taluk (Chikkaballapur district) of Karnataka state. The Chintamani taluk comprises approximately 850 silk saree manufacturing handloom units. In the study it is found that 95% of the respondents are not getting any financial assistance as subsidized loans and less interest loans. No one weaver respondent selling their products directly to the customers. It is also identified that the cost of raw silk yarn and zari, labour, capital, process cost and marketing cost is very high. Many of the respondents feel that they require market guarantee, market information, Silk Yarn at reasonable and stabilized prices. 3.33% of the respondents started weaving sarees with a mixture of silk and cotton instead of pure silk. The Handloom weavers want a separate handloom policy from the government. The government is encouraging weavers to use the Technology Upgradation Fund (TUF). But without a market and capital, it is impossible to benefit from TUF. To conclude, all the weavers (100%) must be covered under the organized sector (co-operative fold) to get benefits of various schemes by government, as many schemes are not available to unorganized sector handloom weavers.

KEYWORDS
Handloom, Silk saree, SMEs, Textile.

INTRODUCTION

The Small Scale Industries (SSI's) are called Micro, Small and Medium Enterprises after the enactment of the Micro, Small and Medium Enterprises Development Act, 2006. MSME's have played a significant role in employment generation, dispersal of industrial establishments and growth & development of the Indian economy. According to the Ministry of Micro, Small and Medium Enterprises, Government of India, the 4th All India Census of MSMEs (2006-07) there are a total of 2.61crore MSMEs and the sector accounts for employment amounting to 5.97 crore persons. The textile MSME's comprising the organized mill sector, the unorganized decentralized sector consisting of handlooms, khadi and powerlooms, is one of the elements of the total MSME's playing a crucial role in the Indian economy today. The Indian Textiles Industry contributes about 14% to industrial production, 4% to the GDP, and 17% to the country's export earnings.

The handloom sector is the largest economic activity after agriculture. Handloom sector is organized in three predominant forms of weavers– Independent weavers, co-operative system weaver and wage weavers. The most prevalent system is that of the wage weavers. Presently, most of these wage weavers work at home. Their work ranges from pre-loom processing to mere weaving, at different places. The handloom industry is largely household-based, carried out with labour contributed by the entire family. It is dispersed, spread across thousands of villages and towns in the country. In the present economic climate where dependency on foreign capital and know-how is increasing all round, the handloom industry presents a sustainable model of economic activity that is not energy intensive and has low capital costs, as well as an extensive skill base. Its survival in, and adaptability to, a wide range of economic conditions also needs to be understood in a proper perspective, in order to underline the inherent viability of this enterprise. Therefore, an objective appraisal of the handloom industry is the need of the day.

The handloom sector forms a precious part of the generational legacy and exemplifies the richness and diversity of our country and the artistry of the weavers. Tradition of weaving by hand is a part of the country's cultural ethos. The sector about 23.77 lakh handlooms provides employment to 43.31 lakh persons. Of which, 10% are scheduled castes, 18% belong to scheduled tribes, 45% OBC and 27% are from other Castes. Production in the handloom sector recorded a figure of 6769 million sqr. meters in the year 2009-10, which is about 23.23% over the production figure of 5493 million sqr. meters recorded in the year 2003-04.

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During 2010-11 (April - Oct., 2010) production in the handloom sector is reported to be 3770 Million sqr. Meters (Provisional) (Annual report 2010-11, Ministry of Textiles, Government of India).

Pit looms are the most widely used handlooms in India. They are of two types. Viz., throw shuttle pit looms and fly shuttle sley pit looms. As the name implies, the looms stands over a pit and the process of picking is done by throwing the shuttle across the sley by hand. The fly shuttle pit loom is the most popular hand operated loom in the country. Its popularity is due to its productivity being 3 or 4 times more than that of an ordinary throw shuttle loom.

STATEMENT OF THE PROBLEM

With Micro (Tiny) businesses traditionally known as Village and Cottage industries as their counter part, Indian SMEs have ancient heritage. But many Handloom SME's are facing the problems of competition from power loom and mill sector, Unskilled Labour, lack of finance etc., This paper attempts to explore the reasons of high cost of silk sarees manufactured by Small and Medium Enterprises. Certain innovative measures are suggested to reduce the cost of manufacturing a silk saree. Thus, the present study is appropriately titled as **"Cost reduction innovation in SME's – An empherical study,** (With reference to Handloom silk sarees in chikballapur district)".

SCOPE OF THE STUDY

The scope of this study is confined to Thimmasandra, Konappalli, Chokkahalli, and Nernakallu clusters of Chintamani Taluk (chikkaballapur district), Karnataka. Further, the study includes an in-depth analysis of cost of handloom silk saree manufactured by small and medium enterprises in chintamani taluk of chikkaballapur district.

OBJECTIVES OF THE STUDY

1.   To Study the reasons for increase in cost of the Handloom silk sarees.
2.   To offer suggestions for cost reduction.

RESEARCH METHODOLOGY

The necessary data for preparing this article is collected from both primary as well as secondary sources. The primary data has been collected from the weavers of handloom silk sarees by using pre-tested structured schedules and also through face to face interviews. The secondary data is collected from various books, journals, magazines, Newspapers, websites etc. The data are analyzed by using simple statistical measures like percentages and diagrams.

SAMPLING

Judgment sampling method has been used for data collection. 150 handloom silk saree weavers have been selected in Thimmasandra, Konappalli, Chokkahalli, and Nernakallu clusters of Chintamani Taluk

CHIKKABALLAPUR – AN OVERVIEW

Chikballapur District was created out of Kolar District on 23.08.2007.The geographical Area of the district is 4,208 Sq. Km. The Total population of the district is 1,254,377 (2011). In Chikballapur District there is 6 Taluks Bagepalli, Chikkabalapura, Chinthamani, Gouribidanur, Gudibanda and Shidlagatta. The gender composition of male and female is 637,504: 616,873. The Average literacy rate is 70.08%. Male literacy is higher (78.36) as compared to females (61.55%).

India	Karnataka	Chikballapur
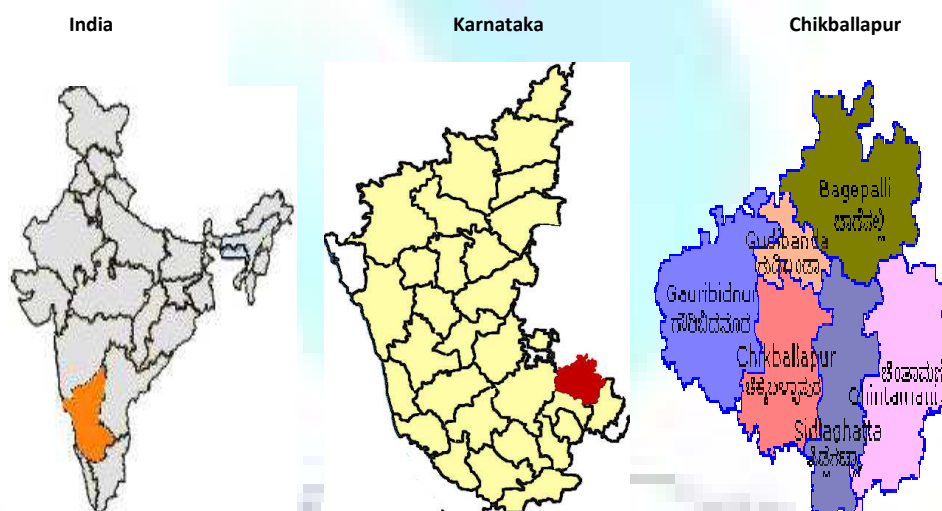
TABLE - 1 RESPONDENTS PROFILE

Items	Basis	Frequency	%
Gender	Male	144	96.00
	Female	06	04.00
Age	18-25 Years	41	27.33
	26-35 Years	78	52.00
	36-45 Years	18	12.00
	45 years & Above	13	08.67
Education Level	Illiterates	55	36.67
	Primary School	68	45.33
	High School	10	06.67
	Pre-University	07	04.67
	ITI/Diploma	06	04.00
	Graduation	03	02.00
	Post graduation	01	00.66
Marital status	Single	60	40.00
	Married	90	60.00

Source: Primary data.

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Among the 150 respondents, more number of respondents is found under the age group of 26 – 35 years. Most of the weaver's children helping in weaving process and learn the weaving process along with supporting activities from the age of 10 years and above. Automatically once they learn the weaving handloom, they become weavers and do not go for education. Therefore, 36.67% have no education and 45.33% respondents studied upto primary school level only. 96% of the respondents are males weaving silk sarees. The female will assist in other allied activities of the handloom weaving. 60% respondents are married and 40% are unmarried.

TABLE 2: ELEMENTS OF COST

Items	Very High	High	Medium	Low	Very Low	Total
Cost of Raw silk and Zari	113 (75.33)	37 (24.67)	0 (0)	0 (0)	0 (0)	150 (100)
Cost of labour	120 (80)	30 (20)	0 (0)	0 (0)	0 (0)	150 (100)
Cost of Capital	125 (83.33)	15 (10)	10 (6.67)	0 (0)	0 (0)	150 (100)
Process Cost	127 (84.67)	20 (13.33)	3 (2)	0 (0)	0 (0)	150 (100)
Marketing Cost	80 (53.34)	50 (33.33)	20 (13.33)	0 (0)	0 (0)	150 (100)

Source: Primary data. (Note: figures in parenthesis indicate the percentage)

It is found that the cost of the raw materials is high because the gold and silver used in zari production is increasing day by day and the raw silk yarn is also going high. All the respondent weavers say that the wages paid for the weaving is very high and labour weavers are reduced due to disinterest towards learning of weaving as the profits available is very low. 93.33% weavers say that the cost of capital is high. Majority of the weavers are borrowing capital from local money lenders with very high rate of interest. The banks and financial institutions are not providing timely finance to the weavers. 98% weavers feel that they are paying more for the process cost in the form of dyeing and for other auxiliary activities. Because, the dyeing material cost has also increased rapidly. 86.67% weavers say that the marketing cost is also high. The majority weaver respondents are depending on middlemen for selling their sarees. The storage facility is not available to the small weavers. Only few master weavers have spacious stores to store more stock.

TABLE 3: AVAILABILITY OF GOVERNMENT ASSISTANCE TO HANDLOOM WEAVERS

Items	Agree	Disagree	No Opinion	Total
General Subsidy loans	9 (6.00)	136 (90.67)	5 (3.33)	150 (100)
Low interest Loans benefit	5 (3.33)	140 (93.34)	5 (3.33)	150 (100)
Support Price for silk sarees	0 (0.00)	150 (100.00)	0 (0.00)	150 (100)
Participation in trade fairs and Exhibition	18 (12.00)	132 (88.00)	0 (0.00)	150 (100)
Housing Subsidy Loans	33 (22.00)	103 (68.67)	14 (09.33)	150 (100)
Benefit of General Insurance	25 (16.67)	95 (63.33)	30 (20.00)	150 (100)
Medical benefits	15 (10.00)	103 (68.67)	32 (21.33)	150 (100)
Benefit of work shed Scheme	18 (12.00)	120 (80.00)	12 08.00)	150 (100)

Source: Primary data. (Note: figures in parenthesis indicate the percentage)

Only 12% respondents are getting least assistance from the government in the form of trade fairs and Exhibition, 6% weavers getting general subsidy loans benefit, 3.33% weavers getting the benefit of low interest loans, 22% weavers are benefited with housing subsidy loans, 16.67% weavers benefited with general insurance, 10% weavers are getting the benefit of medical insurance, 12% weavers are benefited with work shed scheme. Many schemes are not available to the weavers who are out side the organized sector. Weavers of co-operative sector only the beneficiaries of participation in trade fairs and exhibition, general insurance, medical benefits, work shed schemes etc,

TABLE 4: CLASSIFICATION OF HANDLOOM WEAVERS ON THE BASIS OF STRUCTURE

Items	Number of weavers	Percentage
Weavers of Co-operative society	25	16.67
Weaver of KHDC	20	13.33
Independent Weaver	105	70.00
Total	**150**	**100.00**

Source: Primary data

DIAGRAM 1: HANDLOOM WEAVERS ON THE BASIS OF STRUCTURE
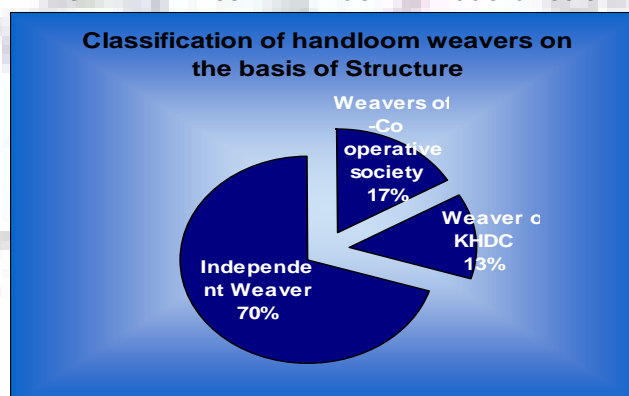
Only 16.67% weavers are covered under co-operative sector and 13.33% weavers are working under the Karnataka handloom development corporation (an undertaking of government of Karnataka). The remaining 70% weavers are independent (private) weavers. As many weavers wanted to be independent weavers rather than working under organized sector and few weavers are not aware of benefits of government available to the organized weaver.

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TABLE 5: AVAILABILITY OF TRAINING FACILITY TO HANDLOOM WEAVERS

Items	Frequency	Percentage
About New Designs	10	06.67
About New Technology	00	00.00
About Marketing	20	13.33
No training	120	80.00
	150	**100.00**

Source: Primary data

Majority of the weavers (80%) are not getting any training facility towards new designs, new technology and marketing. Only the weavers of co-operative sector and KHDC weavers are getting the benefit of training facility of new designs and marketing. Because, the official schemes are available to only organized sector weavers.

TABLE 6: AWARENESS AND USE OF MODERN TECHNOLOGY

Items	Awareness		Usage	
	Frequency	Percentage	Frequency	Percentage
Wraping Machines	150	100.00	10	06.67
Bobin winding machine	150	100.00	25	16.67
Pirn winding Machine	68	45.33	12	08.00
Jaquards	150	100.00	150	100.00
Computer Jaquards	23	15.33	00	00.00

Source: Primary data

Majority of the weavers are aware of new technology but only few weavers are using the modern technology. The main reason is the shortage of finance. With high rate of interest the weavers can not introduce new technology in the activities of weaving process. Only few master weavers are using new machines in allied activities of handloom weaving process.

TABLE 7: MARKETING CHANNELS AVAILABLE TO SILK SAREE HANDLOOM WEAVERS

Items	Frequency	Percentage
Direct Marketing	00	00.00
Own selling outlets	15	10.00
Through Middlemen	135	90.00
	150	**100.00**

Source: Primary data

DIAGRAM 2: MARKETING CHANNELS USED BY HANDLOOM WEAVERS
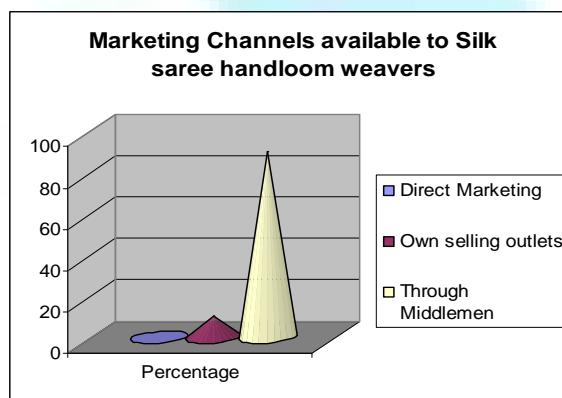
90% of the weaver respondents are selling their manufactured sarees through middlemen. Because, weavers need cash in short time (one week) to meet working capital needs and to get the livelihood. Only 10% respondents are having own selling outlets with their own capital.

TABLE 9: TYPE OF RAW MATERIAL USED

Items	Frequency	Percentage
Pure silk	145	96.67
Mixture of silk and cotton	05	03.33
Mixture of silk and polyster	00	00.00
	150	**100.00**

Source: Primary data

DIAGRAM 3: RAW MATERIALS USED IN SILK SAREE MANUFACTURING

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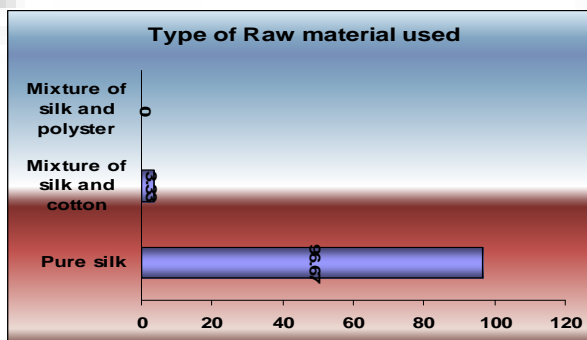
96.67% weavers are using pure silk in weaving silk saree. Only 3.37% weavers have started weaving a saree with mixture of silk and cotton. The cheap fabrics made the silk sarees kept aside with attractive texture. To compete with the cheap fabrics the silk saree weavers started to come out with a new idea of mixture of silk with cotton. Which inturn reduce the cost of saree with attractive designs than other cheap fabrics.

TABLE 10: COMPARISION OF COST PER PAITHANI SILK SAREE BETWEEN 2001 AND 2011

Particulars	2001	2011	Total increase	% increase
Cost of Raw silk yarn	385	700	315	81.81
Zari	170	425	255	150.00
Labour (Wages)	150	275	125	83.33
Dyeing charges	15	25	10	66.67
Process cost	10	30	20	200.00
Other charges	15	26	11	73.33
Total Cost	745	1480	735	98.65

Source: Primary data.

DIAGRAM 4: COST COMPARISION OF A SILK SAREE BETWEEN 2001 AND 2011

COMPARISION OF COST PER PAITHANI SILK SAREE BETWEEN 2001 AND 2011
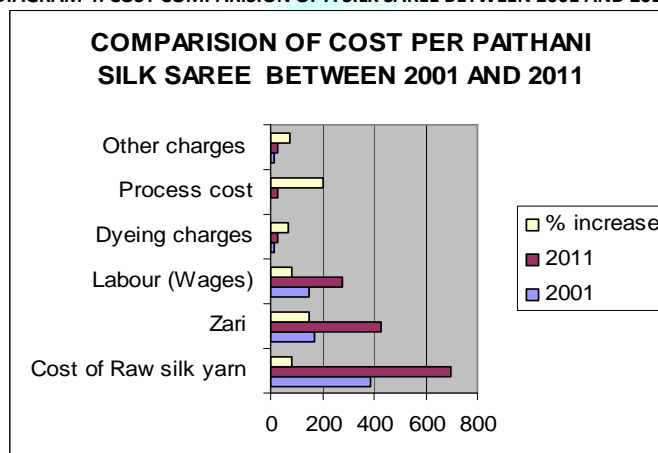
FINDINGS

- It is found that 96% weavers are male weaving silk sarees and the other female members and children of the weaver family are supporting with allied activities of handloom.
- 55% weavers are illiterates and 45.33% weavers are having primary education. It is found that the handloom weavers are busy with the activities of handloom weaving and other allied activities to continue with their profession.
- In the study it is also identified that the cost of raw silk yarn and zari, labour, capital, process cost and marketing cost is very high.
- The financial sources for majority of the weavers are local money lenders with high rate of interest. The banks and financial institutions are not interested to lend loans to weavers, as they think that they may not return due to low profits or no profits during some seasons. Due to lack of finance, the weavers are getting raw materials from a master weaver to avoid the investment in stock.
- Majority of the weavers are not aware of many benefits and schemes offered by the government to the handloom weavers. Only few of them are covered under the co-operative sector and getting some of the welfare benefits. As many schemes are not available to the weavers who are out side the organized sector. And also only the weavers of co-operative sector are enjoying the benefit of participating in trade fairs and exhibitions, general insurance, medical benefits, work shed schemes etc,
- Majority (70%) of the respondents are private independent weavers. They are weavers from many years. Handloom silk saree weaving is their born profession. They do not know any other work or profession.
- There is no institute to provide training to the weavers. Weavers are following traditional methods of weaving. Therefore, the cost of saree is high as the process of weaving is slow and number of sarees woven is less.
- Majority of the weavers are aware of new technology through newspapers, Television, friends and relatives. But they are unable to introduce the new technology because of shortage of capital, financial assistance etc.,
- Majority (90%) of the respondents are depending on middlemen for marketing the sarees. The middlemen commission occupies major share of returns and thus reduces profit of weavers.
- Majority of the weavers are labour weavers. But they were independent master weavers earlier, they became labour weavers to get raw materials, wages and continuous employment from few master weavers as the cost goes on increasing continuously.
- Some of the respondents are using the mixture of silk with cotton in its saree production to reduce the cost. The saree called "gadwall saree" of Andhra Pradesh where the entire warp, design part and the palloo part consist of pure silk and the remaining part of wept is woven by cotton.
- It can be noted that the cost has steadily risen in all respects. The cost of raw silk yarn has been increased by 81.81% in 2011 compared to 2001. The cost of zari has been increased by 150%, wage rate is increased by 83.33%, the dyeing cost increased by 66.67%, the process cost increased by 200%, other cost increased by 73.33%. The total cost increased by 98.65% in 2011 when compared to 2001 But, the selling price has not increased proportionately.
- The Handloom weavers are expecting a separate handloom textile policy rather than announcing few benefits and schemes from the government.

SUGGESTIONS

1. At present the government is providing many facilities to the weavers of organized sector only. Apart from these it is suggested that the government has to provide financial assistance to the handloom weavers irrespective of sectoral differences.

2. To reduce the cost of a saree, the technological changes are of immense need. The present study says that no technology is used by most of the weavers. Only when they are financially strengthened, they can afford the technology in their process. The weavers are ready to introduce the new technology. But, they need financial assistance for purchasing technology. By the help of modern technology in the process of weaving they can produce more number of sarees for given period. Then automatically the cost per saree reduces.

3. As far as competition is concerned, the powerloom is the most dominating sector in textile field to throw competition to handloom sector. The powerlooms produces more number of sarees in given period, use high technology, produce modern designs with less cost. The same should be checked by the government with certain policies like implementation of handlooms (reservation of articles of production) Act 1985.

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4. It is suggested that the market for handloom silk sarees should be extended from local markets to national and international markets to increase demand parallel to cheap fabrics. Another suggestion is that the direct marketing can reduce the cost of saree to the extent of middlemen commission. Then the cost of a saree can be reduced with the increased profits. The development of marketing skills through training can be advised.

5. State and Central Government has to establish the raw material depots to supply raw silk yarn, zari and other raw materials at reasonable and stable prices continuously and providing continuous employment is suggested by bringing all the handloom weavers under organized sector. Then it is possible to produce saree at low cost at all the times.

6. The government has to establish information centers to provide information to the weavers about demand, supply, and prices, at national and international levels. The handloom weavers are to be given monetary incentive (encouragement money) to encourage the weavers it is provided to milk producers and some farmers in Karnataka.

CONCLUSION

"Industrialise or perish" is the slogan of the day. The role played by micro, small and medium enterprises is significant in over all growth of the economy. The enterprises acts as a nursery for the development of entrepreneurial talent and has been contributing significantly to the State as well as district's gross domestic products, besides, meeting the social objectives.

Thus, there is a future for handloom sector in India even the living and working conditions for handloom weavers is likely to decline. However, one needs active government support for Handloom sector.

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INTERDEPARTMENTAL SOCIAL NETWORK ANALYSIS – A PRACTICAL APPROACH

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ABSTRACT

Companies often restore to interdepartmental team work to invent new product line, discuss new promotion strategy or evolve long term plan and short-term tactics. To derive optimal benefit from these teams, it is imperative to understand the team dynamics including who is the natural leader, who will help in quick information dispersal, who has the most influence in the team and how cohesive is the team. One of the tools used to understand this team dynamics is SNA or Social Network Analysis. This study was carried out at a major Automobile parts manufacturer in Chennai. The objectives of the study were: identify the most influential personnel in the team, identify key member who forms the central figure, identify the member who has access to information flow and identify the member who can be used to disseminate information among the team. 25 employees in the most active interdepartmental team were analyzed. The network was analyzed for Degree Centrality, Closeness Centrality and Betweenness Centrality and key personnel were identified to fulfill the study objectives.

KEYWORDS

Social Network Analysis, Centrality Measures, SNA.

INTRODUCTION

The increased competitive environment and squeezing profit margins have forced companies to find new ways to tackle the competition. Interdepartmental teams in companies try to come up with new product line, discuss new promotion strategy or evolve long term plan and short-term tactics. To derive optimal benefit from these teams, it is imperative to understand the team dynamics including who is the natural leader, who will help in quick information dispersal, who has the most influence in the team and how cohesive is the team One of the tools used to understand team dynamics is SNA or Social Network Analysis. Measuring and mapping of flow between people, groups, organizations and other entities is called Social Network Analysis. It is often abbreviated as SNA. The nodes in the network are the people and groups while the links show relationships between the nodes. Social network analysis is being used in varied fields like study of local communities, politics and power, lobbying, voting network, uncloaking terrorist network, economic conspiracies, online social communities, data mining of emails and varied other socioeconomic fields.

One of the Chennai based Auto Parts Company wanted to analyse and get optimal advantage from its most active interdepartmental team. The authors with the help of personnel department carried out Social Network Analysis to achieve the objectives.

OBJECTIVES

1. Identify natural leader in the network instead of the appointed leader.
2. Identify the most influential personnel in the interdepartmental network.
3. Identify the member who has access to information flow in the network and who forms the anchor between various departments in the network.
4. Identify the member who can be used to disseminate information.
5. Measure the length of network.

METHOD

PARTICIPANTS

Twenty five employees from of the most active interdepartmental team were identified for survey. The key personnel were surveyed to find whom they will contact for work related and personal related doubts. If an employee A looks to personnel B for advice or opinion then an arrow is drawn from node A to node B. The pattern of direct and indirect arrows surrounding a node helps determine the influence of that person.

TABLE 1: PARTICIPANT DESCRIPTIVE STATISTICS

Employee Department	Employee Code	Number of Employees
Marketing	MM01 to MM10	10
Production	PP01 to PP07	7
Finance	FF01 to FF06	6
R&D	RD01 to RD02	2

MEASURE AND PROCEDURE

The participants were administered questionnaire based on Organizational Network Survey. The data was fed into UCInet Matrix spreadsheet editor. The matrix was the basis for calculation of various Social Network indexes including Degree Centrality, Betweeness Centrality and Closeness Centrality. Netdraw software was used for drawing the organisation's interdepartmental personnel Network and Ucinet software was used for analysis.

Key terms: To understand Social Network Analysis, it is imperative to understand some terms. They are delineated below:

1. Nodes: Nodes are people connected to the network. Nodes are also called 'actor'.
2. Size of Network: The size of a network can be determined in terms of the number of nodes of the network, alternatively, as the number of edges in the network. Size in terms of nodes can be critical for the structure of social relations because of the limited resources that each actor may have for building and maintaining ties.
3. Degrees: The number of direct connections a node has.
4. Degree Centrality: Network activity for a node is measured by using the concept of degrees. Common wisdom in social networks is "the more connections, the better." This is not true. What is important is where those connections lead to , and how they connect the otherwise unconnected.

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5. Betweenness Centrality : Betweenness centrality views an actor as being in a favored position to the extent that the actor falls on the geodesic paths between other pairs of actors in the network.

6. Degree Centrality: Personnel who have more ties to other personnel may be in advantaged positions. Because they have many ties, they may have alternative ways to satisfy needs, and hence are less dependent on other individuals. A very simple, but often very effective measure of a personnel's centrality and power potential is their degree. In undirected data, actors differ from one another only in how many connections they have. With directed data, however, it can be important to distinguish centrality based on in-degree from centrality based on out-degree. If an actor receives many ties, they are often said to be prominent, or to have high prestige**.** That is, many other actors seek to direct ties to them, and this may indicate their importance. Actors who have unusually high out-degree are actors who are able to exchange with many others, or make many others aware of their views. Actors who display high out-degree centrality are often said to be influential actors.

SOFTWARES FOR NETWORK ANALYSIS

Many software are available for analysis. Famous software are - UCINet, Cytoscape, ORA, Pajek, GUESS. Private GUI packages are Orgnet, Keyhubs, and KXEN. Other SNA platforms, such as Idiro SNA Plus, have been developed for industries such as telecoms and online gaming where massive data sets are analysed. AutoMap, cFinder, Detica NetReveal, Dsicourse Network Analyzer, DyNet, EgoNet, Gephi, Graphviz, Idiro SNA Plus, igraph, iPoint, JUNG Framework, NetMiner, SNA-Network are some other main application packages.

DATA ANALYSIS AND RESULTS

DEGREE CENTRALITY

Analysis of degree centrality of the interdepartmental employee network (Appendix: Figure 1) is shown in Table 2. 'In Degree' Centrality refers to the number of ties that the actor (employee) receives and 'Out Degree' centrality refers to the ties that an actor seeks to have. Employee Numbers MM01 and PP02 have the highest out degree of 8 and 8. These two employees are the best node to disseminate information to the network. The 'In Degree' is highest for Employees MM06 and MM10 with a score of 7. It can be concluded that they are the most influential employees.

TABLE 2: DEGREE CENTRALITY

Emp No.	Out Degree	In Degree
MM01	8	4
PP02	8	5
MM04	6	6
MM09	6	4
MM08	5	7
PP07	5	4
MM07	5	4
PP01	5	3
MM03	5	5
PP06	5	6
MM06	5	7
MM02	4	4
MM10	4	7
MM05	4	5
FF05	4	2
PP04	3	5
FF03	3	0
FF01	2	1
PP03	2	6
FF02	2	0
RD02	2	1
FF04	1	2
RD01	1	2
FF06	1	1
PP05	0	5

EIGEN VALUE

Eigen value can be used to determine which employee is more central among high degree employee. It was found in the earlier table that the 'In Degree' is highest for Employees MM06 and MM10 with a score of 7. The 'In Eigen' vector value (Table 3) for Employee MM10 (SCORE: 9.604) is the highest. It means most employees seek his help in the interdepartmental network. Thus he is the natural leader of the network.

TABLE 3: THE EIGEN VECTOR

Emp No.	Out Eigen Vector	In Eigen Vector
MM01	8.769	4.342
MM02	4.044	5.847
MM03	7.361	5.728
MM04	8.227	5.718
MM05	5.268	8.881
MM06	6.304	9.277
MM07	8.415	6.565
MM08	7.147	7.677
MM09	8.956	5.409
MM10	6.019	9.604
PP01	4.672	2.78
PP02	5.624	3.547
PP03	2.036	6.079
PP04	2.009	2.839
PP05	0	4.534
PP06	3.603	5.102
PP07	2.586	1.227
FF01	1.528	0
FF02	2.006	0
FF03	0.831	0
FF04	1.173	0.691
FF05	3.575	1.808
FF06	0.697	0
RD01	0.504	0.846
RD02	0.895	0.352

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CLOSENESS CENTRALITY

Analysis of Closeness centrality of the interdepartmental employee network (Appendix: Figure 1) is shown in Table 4. 'inFarness' is the sum of the column of the geodesic distance. 'OutFarness' is the sum of row of the geodesic distance. Employee Number P05 is the closest to highest number of other employees (inCloseness score 43.63). This employee can be used to spread information or new skill in the fastest possible time.

TABLE 4: CLOSENESS CENTRALITY

Emp No.	inFarness	outFarness	inCloseness	outCloseness
P05	55	600	43.636	4
PP03	71	159	33.803	15.094
MM08	71	142	33.803	16.901
MM04	71	143	33.803	16.783
PP06	71	146	33.803	16.438
MM06	72	142	33.333	16.901
MM07	74	144	32.432	16.667
MM10	74	147	32.432	16.327
MM03	75	139	32	17.266
PP02	75	137	32	17.518
PP04	78	150	30.769	16
MM05	80	142	30	16.901
MM02	80	145	30	16.552
MM09	81	143	29.63	16.783
MM01	81	133	29.63	18.045
PP07	84	149	28.571	16.107
PP01	85	139	28.235	17.266
FF05	89	141	26.966	17.021
FF04	92	163	26.087	14.724
RD01	96	165	25	14.545
RD02	108	159	22.222	15.094
FF06	553	137	4.34	17.518
FF01	576	111	4.167	21.622
FF03	600	135	4	17.778
FF02	600	81	4	29.63

BETWEENESS CENTRALITY

A node with high betweenness has great influence over what flows - and does not - in the network. They form the 'broker' and know the general thought process of the network. Table 5 shows that Employee numbers PP02 and MM01 have 76.9 and 64.7 betweenness . They form the anchor between various departments in the network. To understand the viewpoint of network and to understand the information flow, these employees can be tapped by the management.

TABLE 5: BETWEENNESS CENTRALITY

Emp No.	Betweenness	nBetweenness
PP02	76.978	13.945
MM01	64.799	11.739
MM06	56.105	10.164
MM05	51.969	9.415
FF05	51.82	9.388
MM08	50.021	9.062
PP06	40.648	7.364
PP07	40.464	7.33
MM04	36.751	6.658
MM07	36.212	6.56
MM10	33.879	6.137
MM03	32.17	5.828
PP01	30.073	5.448
PP03	21.969	3.98
PP04	15.896	2.88
MM02	8.881	1.609
FF04	8.266	1.497
MM09	7.088	1.284
FF06	6.344	1.149
RD01	4.056	0.735
FF01	3	0.543
RD02	2.611	0.473
FF03	0	0
PP05	0	0

LIMITATION

The study has the following limitations:

1. The results of this network analysis cannot be extrapolated to other similar shaped network as the nodes and connections in the network may differ in other studies.
2. If some key employees studied in the network leave the organization, the entire network needs to be reanalyzed.
3. The selection of participants was based on Management and employees input. Selection could have been made more objective by management independent survey.

DISCUSSION

Analysis of the Interdepartmental Social Network leads to identification of key personnel of the network.

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1. The natural leader in the interdepartmental network is Employee MM10 ('In Eigen' vector value: 9.604).
2. The two influential personnel in the interdepartmental network are Employees MM06 and MM10 with a 'In Degree' score of 7 each.
3. The members who have access to information flow in the network and who form the anchors between various departments in the network are Employee numbers PP02 and MM01 with 'betweenness' value of 76.9 and 64.7 respectively .
4. The member who can be used to disseminate information is Employee Number P05 with a 'inCloseness' score of 43.63. This employee can be used to spread information or new skill in the fastest possible time.
5. Measure the length of network.

## CONCLUSION AND IMPLICATIONS FOR FUTURE RESEARCH

This study has contributed to research in practical use of Social Network Analysis. By establishing that the analysis will be helpful in critical management – interdepartmental negotiations, the study paves the way for other similar research in organization, not only in interdepartmental negotiations but also in routine management aspects like network study of multidisciplinary teams, study of interdepartmental projects, intra department issues, Branding, CRM and similar organizational issues.

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APPENDIX

FIGURE 1: SOCIAL NETWORK GRAPH OF KEY INTERDEPARTMENTAL MEMBERS
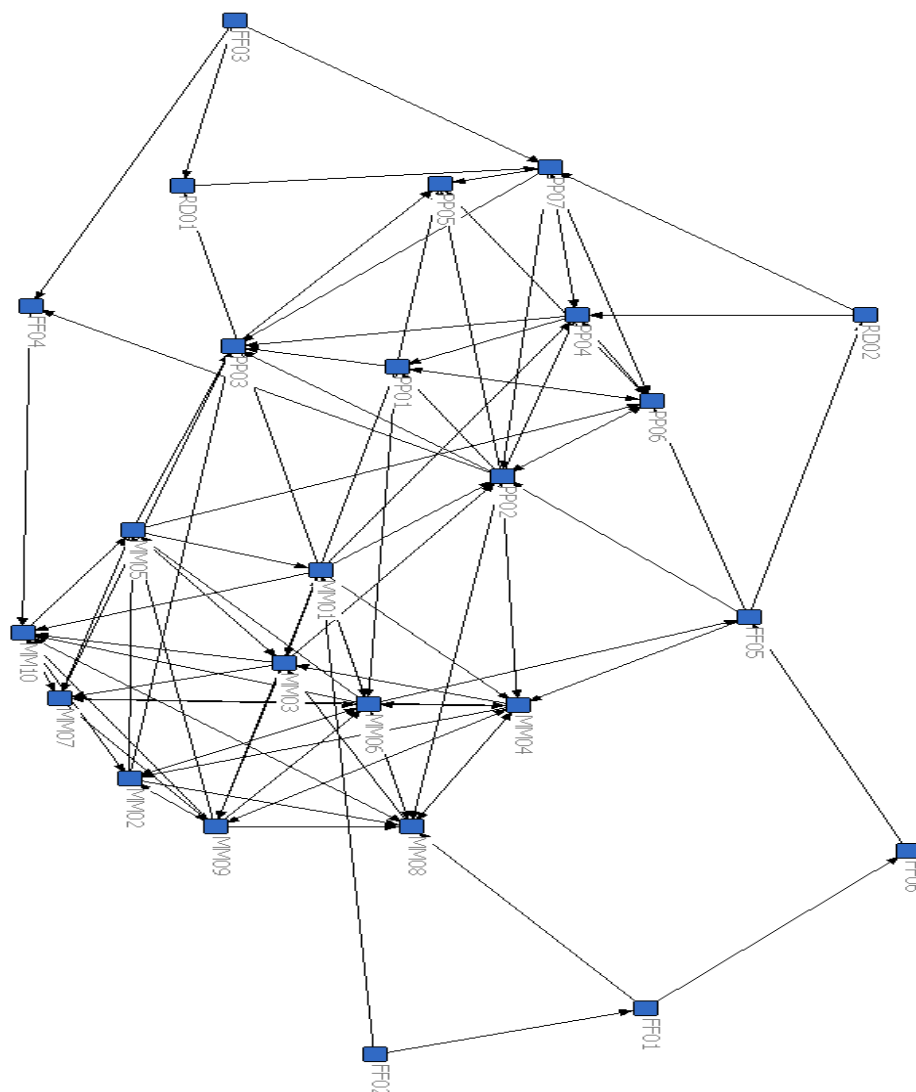
- The numbers in the Graph nodes represent the Employee Numbers (Dummy numbers have replaced the actual employee number in this paper to maintain privacy of employees).
- The Graph picture has been provided as separate file (interdepartmental network.bmp) for publication.

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AWARENESS TOWARDS E-MARKETS AMONG THE PEOPLE OF KURNOOL CITY OF A. P.

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ABSTRACT

E-Business can be defined as any form of business transaction in which the parties interact electronically rather than by physical exchange of documents or direct meetings. In other words, E-Business is doing business online. It can mean selling data directly from Internet, paying bills through the bank account or purchasing or trading online. It can also mean the use of Internet as an alternative sales channel and the entire transaction can take place with no human intervention on the merchant side. The number of Indians shopping online grew 42% over the last year, almost double the rate of growth of the Internet medium (i.e. 22%), sure proof of internet shopping gaining attractions with value seeking desi consumers, concerns online security and vendor trust not withstanding. Review of literature reveals that majority of the studies are based on conventional market. There are very meager studies on E-markets. India's online population currently stands at 25 million and is predicted to grow to 100 million by 2012. Changing lifestyles and shopping habits have fueled E-Business. Indian users have started to use this medium like never before. Rs.570 crores worth of E-Business conducted online in 2004-05, Rs.2, 300 crores by 2007-08, and is expected that it will reach Rs. 10,000 crores by 2012. Kurnool city, with about 7 lakh population and being a fast growing city and industrial hub with mixed culture. This necessitated conducting a study on awareness of e-markets among the people of Kurnool city.

KEYWORDS

E-Markets in Kurnool, E-Business in Kurnool, Awareness towards E-Markets, Awareness towards E-Business, Awareness towards E-Shopping.

INTRODUCTION

-Business can be defined as any form of business transaction in which the parties interact electronically rather than by physical exchange of documents or direct meetings. In other words, E-Business is doing business online. It can mean selling data directly from Internet, paying bills through the bank account or purchasing or trading online. It can also mean the use of Internet as an alternative sales channel and the entire transaction can take place with no human intervention on the merchant side.

An electronic market is the use of information and communications technology to present a range of offerings available in a market segment so that the purchases can compare the prices and other attributes of the offerings and make a purchase decision. E-Markets are key to faster and more efficient trade. E-Markets have a positive influence all through the supply chain. There are challenging technical and technological issues in setting up and operating E-Markets. E-Procurement has emerged in a big way

BENEFITS TO BUYERS FROM E-MARKETS

- Aggregation of multiple suppliers
- Direct access to suppliers and through dynamic pricing
- Location and tracking of new suppliers
- Provides more negotiating power
- Leads to quick response buyers

The number of Indians shopping online grew 42% over the last year, almost double the rate of growth of the Internet medium (i.e. 22%), sure proof of internet shopping gaining attractions with value seeking desi consumers, concerns online security and vendor trust not withstanding.

REVIEW OF LITERATURE

Effective policy formulation always needs a thorough and continuous search into the nature of the reasons for, and the consequences of organisation. In line with this, some related earlier studies conducted by individuals and institutions are reviewed to have an in-depth insight into the issues of consumer's behaviour. An overall view of a few studies is presented below.

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Neelamegham (1969) conducted a study on, 'Consumer Behaviour in Relation to Marketing of Man-made Fibre Fabrics in India', the study was conducted by drawing a sample of 1,170 households in Delhi. It was found that consumer's preferences for man-made fibre-fabrics were significantly influenced by several socio-economic factors including, age, income and occupational characteristics. Among the different occupational groups, man-made fibre fabrics were found to be most popular with business executives, and professional men and individual proprietors, while they were least popular with factory workers. The percentage of workingwomen who owned garments made by man-made fibre fabrics was larger than that of house-wives. It is also found that purchasing of clothes was a joint activity of both husband and wife, though husband played a dominant advisory role.

Ramakrishna Rao, Rama Raju, and Ram Prasad (1987) conducted a survey on "Husband-wife Involvement in Buying Decision-Making". One of the major findings of the study is, husband who are young, highly educated and belongs to high income group are relatively less dominated than their older, less educated and low-income group counterparts.

A study was conducted by doctoral students of IIM Ahmedabad (Anirban Ghosh, Avinandan Mukherji and V.V.P.Badrinath) to identify the emerging the need of typical Indian consumers in three product categories of a) Automobiles b) Televisions and c) Credit cards. It was observed in the above study that in terms of occupation and education and income the credit card penetration level was found to be the highest among post- graduates, professional and individual drawing income more than Rs.2 lakhs per annum. In case of the television market it was observed that television owners were mainly graduates and postgraduates, though among diploma holders there was the highest proportion of people intending to purchasing a television. This is an indication to the industry to tap this new emerging market segment. The study indicates the behaviour patterns of a particular social class.

Janardhan Rajini (1997) in his study on " Store avoidance behavior – An Exploratory study " is to explore the concept of store avoidance behavior related to apparel purchases. Three factors – consumer characteristics, situational characteristics and retail characteristics / store attributes were postulated to influence store avoidance behavior. The results indicated that situational influences were likely to affect the avoidance of stores. consumers avoided stores under different physical and social context. Location, presence of friends and family and the number of fellow shopper in the stores affected the avoidance of stores. Consumers avoidance of stores was influenced by time pressured situations. It was also influenced by peak holiday, gift giving and weekend periods. The influence of retail attributes on avoidance behavior were significant. The reasons for avoidance were multiple, consistent and unchanging. Consumers appeared to be influenced by not one significant attribute but rather a multiplicity of attributes. The shoppers avoided stores if they consistently encountered the same problem in the same stores. The reasons for avoiding stores remained stable and unchanging overtime.

Sanjaya S Gaur & K.Abdul Waheed (2002) conducted a study on " Buying behavior of branded fine Rice" to understand the factors for brand preference and satisfaction in the purchase of branded fine rice. A sample of 200 households from Chennai city and 200 household from Coimbatore city were selected for the study by simple random sampling method with replacement. The data was collected by personal interview through a schedule.

Jacqui Daly; Stuart Gronow; Dave jenkins; Frances Plimmer,(2003) in their study on "Consumer behaviour in the valuation of residential property: A comparative study in the UK, Ireland and Australia. This paper reports the results of empirical investigations that examine behavioural aspects of residential property valuations. Rajesh Kumar,(2007) has conducted a study entitled "Consumer behaviour with reference to selected durables in Kurnool District of Andhra Pradesh". This study reveals the purchase potential and consumer decision making with regard to durables. Chakravarthy N.S., (2008) has conducted a study entitled "Consumer behaviour with reference to two wheelers in Kurnool District of Andhra Pradesh". This study reveals the expectations and satisfaction levels of customers towards durables.

NEED FOR STUDY

Review of literature reveals that majority of the studies are based on conventional market. There are very meager studies on E-markets. India's online population currently stands at 25 million and is predicted to grow to 100 million by 2012. Changing lifestyles and shopping habits have fueled E-Business. Indian users have started to use this medium like never before. Rs.570 crores worth of E-Business conducted online in 2004-05, Rs.2, 300 crores by 2007-08, and is expected that it will reach Rs. 10,000 crores by 2012.

Kurnool city, with about 7 lakh population and being a fast growing city and industrial hub with mixed culture. This necessitated conducting a study on awareness of e-markets among the people of Kurnool city.

OBJECTIVES OF THE STUDY

The main objective of the study is to find the awareness of e-markets among the people of Kurnool city. The focus is on the following

1.   To study the awareness of people towards e-markets
2.   To identify the type of products and frequency of purchase through e-markets.
3.   To list out the most popular websites searched by the people
4.   To find out the awareness of various cyber laws.
5.   To analyse the satisfaction levels with regard to delivery system and quality of goods.
6.   To examine the mode of payment on e-shopping

RESEARCH METHODOLOGY

AREA SELECTION

The present study is on "Awareness of e-markets among the people of Kurnool city" , Kurnool was the capital of Andhra state during 1953-56. The city is known for its rich history, culture and architecture representing its unique characteristic 'Kurnool City – The Gate Way of Rayalaseema'. Geographically it is the only city in India bounded by two rivers namely 'Tungabhadra' and 'Hundri.' It is industrially developed with many public and private sector companies. It is also one of the most developing cities in the emerging IT economy of India as it lies between India's IT hub Hyderabad and Indian Silicon Valley, Bangalore.

Sample Size: The study has been conducted pertaining to the awareness of E-Markets among the people of Kurnool city. The sample was non-probability convenience random sample, consisting of 279 respondents with varied groups.

Data Collection: The primary data has been collected through structured questionnaires and secondary data has been through books, journals, magazines and Internet.

DATA ANALYSIS AND INTERPRETATION

Awareness of E-Markets

	Aware of E-Markets	Not Aware of E-markets	Total
Number of Respondents	105	174	279
Percentage of Respondents	37.63%	62.36%	100%

Source: Field Investigation.

Out of the total respondents, 37.63% of the sample respondents are aware of e-markets while the majority 62.36% of the respondents are not aware of the e-markets.

Awareness of E-Markets of sample respondents by age

	Less than 25 years	25 years – 35 years	36 years – 45 years	46 years – 55 years	55 years and above	Total
Number of Respondents	37	34	17	9	8	105
Percentage of Respondents	35.23%	32.38%	16.19%	8.57%	7.61%	100%

Source: Field Investigation

Among the respondents who were aware of e-markets, 37 of them were in the age group of less than 25 years, 34 respondents were in the age group of 25 – 35 years. 17 respondents were in the age group of 36 to 45 years, while 9 of them were in the age group of 46 to 55 years, the rest 8 respondents were above 55 years of age.

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Awareness of E-Markets based on the educational qualifications

	Up to S.S.C.,	Inter	Graduate	Post Graduate	Professional	Total
Number of Respondents	7	13	41	23	21	105
Percentage of Respondents	6.66%	12.38%	39.04%	21.90%	20.00%	100%

Source: Field Investigation

Among the respondents who are aware of e-markets majority of the respondents are Graduates. 39.04% of the respondents are Graduates, followed by 21.90% of the respondents are Post Graduates, 20% of the respondents are professionals. 12.38% of the respondents have studied up to Intermediate, while the remaining 6.6% of them have studied SSC.

Occupation of the sample respondents

	Student	Professional	Business	Employee	Academician	House Wife	Others	Total
No of Respondents	43	21	17	7	9	5	3	105
% of Respondents	40.95%	20.00%	16.19%	6.66%	8.57%	4.76%	2.85%	100%

Source: Field Investigation

Of the respondents who are aware of e-markets 43 respondents are students, followed by 21 respondents are professionals, 17 of them are business men, 9 respondents were academicians, while 7 are employees and 5 respondents are house wives.

Purchase of products through e-markets by sample respondents

	Electronic Goods	Books	Music & Movies	Others	None	Total
Number of Respondents	27	10	3	1	64	105
Percentage of Respondents	25.71%	9.53%	2.85%	0.95%	60.95%	100%

Source: Field Investigation

Of the total respondents who are aware of e-markets 39.05% of them buy through e-markets while the majority i.e. 60.95% of them is aware of e-markets but they do not buy any product through e-markets. Majority of the respondents buy electronic goods through e-markets i.e. 25.71% of the respondents buy them, while 9.53% of them buy books, 2.85% Music and movies. However there are many respondents who buy more than one type of product through e-markets.

Services availed by the respondents in E-Markets

	Railway Reservation	Airline Reservation	Movie Tickets	Tourism Packages	Online Banking	Un used	Total
No of Respondents	12	8	0	2	19	64	105
% of Respondents	11.42%	7.62%	0%	1.90%	18.09%	60.95%	100%

Source: Field Investigation

Among the total respondents who are aware of e-markets all of them use the e-market services. Majority of the respondents use e-markets for online banking i.e. 18.09% of the respondents use them, 11.42% for railway reservation, 7.62% for Airline reservation, 1.90% of them use it for tourism packages.

Frequency of usage of e-markets

	Daily	Weekly	Fortnightly	Monthly	Occasionally	Total
Number of Respondents	0	7	9	8	17	41
Percentage of Respondents	0%	17.07%	21.95%	19.51%	41.46%	100%

Source: Field Investigation

The frequency of usage of e-markets among the sample respondents revealed that majority of them use e-markets occasionally i.e. 17 respondents. Followed by 9 of them use it on fortnightly, while 8 of them use it on monthly basis. 7 of the total respondents use it weekly and no one is using it on a daily basis.

Mode of payment in E-Markets

	Credit Cards	Debit Cards	E-Payments	Others	Total
Number of Respondents	19	21	1	0	41
Percentage of Respondents	46.34%	51.22%	2.44%	0%	100%

Source: Field Investigation

Among the respondents who use the e-markets majority of the respondents make their payment through debit cards. Of the total respondents 51.22% of the respondents use debit cards, 46.34% of them use credit cards as their mode of payment, 2.44% of them use e-payments as their payment system.

Preference towards E-Market usage by the respondents

	Time Saving	Easy Accessibility	Quick Response	Cost Minimization	Total
Number of Respondents	17	15	6	3	41
Percentage of Respondents	41.46%	36.58	14.63%	7.31%	100%

Source: Field Investigation

Out of total respondents 41.46% of them prefer e-markets because of time saving, 36.58% of them prefer for easy accessibility, 14.63% of them prefer it for quick response and 7.31% of them prefer for its cost minimization. Some of the respondents have preferred more than one factor as their preference for the e-markets.

Awareness of Cyber laws among the sample respondents

	Yes	No	Partial	Total
Number of Respondents	34	44	27	105
Percentage of Respondents	32.38%	41.90%	25.71%	100%

Source: Field Investigation

Among the total respondents, 41.90% of the respondents are not aware of cyber laws, 32.38% of the respondents are aware of cyber laws and the balance 25.71% of them have a partial knowledge about cyber laws.

Respondents Opinion with regard to delivery of goods and services

	Good	Satisfactory	Bad	Total
Number of Respondents	29	7	5	41
Percentage of Respondents	70.73%	17.07%	12.19%	100%

Source: Field Investigation

Of the total respondents 70.73% of the respondents felt that the goods or services delivered through e-markets are good. 17.07% of the respondents were satisfied with regard to delivery of goods & services through e-markets and 12.19% respondents felt that the goods and services rendered by e-markets as bad.

Tenure of Association with E-Markets

	Less than one year	1 – 3 years	3 – 5 years	5 years and above	Total
Number of Respondents	20	17	4	0	41
Percentage of Respondents	48.78%	41.46%	9.75%	0%	100%

Source: Field Investigation

Of the total respondents 48.78% of them were associated with e-markets for less than one year. 41.46% of the respondents were using the e-markets for the past 1 to 3 years. 9.75% of them were using the e-markets for the past 3 to 5 years.

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Satisfaction level of e-markets by the sample respondents

	Highly Satisfied	Satisfied	Not Satisfied	Total
Number of Respondents	27	9	5	41
Percentage of Respondents	65.85%	21.95%	12.19%	100%

Source: Field Investigation

Among the total respondents 65.85% of them are highly satisfied with e-markets followed by 21.95% of the respondents are satisfied and the balance 12.19% of them are not satisfied through e-markets.

CONCLUSIONS AND SUGGESTIONS
CONCLUSIONS

- Out of the total respondents, 37.63% of the sample respondents are aware of e-markets while the majority i.e. 62.36% of the respondents is not aware of the e-markets.
- Among the respondents who were aware of e-markets, 37 of them were in the age group of less than 25 years, 34 respondents were in the age group of 25 – 35 years. 17 respondents were in the age group of 36 to 45 years, while 9 of them were in the age group of 46 to 55 years, the rest 8 respondents were above 55 years of age.
- Among the respondents who are aware of e-markets majority of the respondents are Graduates. 39.04% of the respondents are Graduates, followed by 21.90% of the respondents are Post Graduates, 20% of the respondents are professionals. 12.38% of the respondents have studied up to Intermediate, while the remaining 6.6% of them have studied SSC.
- Of the respondents who are aware of e-markets 43 respondents are students, followed by 21 respondents are professionals, 17 of them are business men, 9 respondents were academicians, while 7 are employees and 5 respondents are house wives.
- Of the total respondents who are aware of e-markets 39.05% of them buy through e-markets while the majority i.e. 60.95% of them is aware of e-markets but they do not buy any product through e-markets. Majority of the respondents buy electronic goods through e-markets i.e. 25.71% of the respondents buy them, while 9.53% of them buy books, 2.85% Music and movies. However there are many respondents who buy more than one type of product through e-markets.
- Among the total respondents who are aware of e-markets all of them use the e-market services. Majority of the respondents use e-markets for online banking i.e. 18.09% of the respondents use them, 11.42% for railway reservation, 7.62% for Airline reservation, 1.90% of them use it for tourism packages.
- The frequency of usage of e-markets among the sample respondents revealed that majority of them use e-markets occasionally i.e. 17 respondents. Followed by 9 of them use it on fortnightly, while 8 of them use it on monthly basis. 7 of the total respondents use it weekly and no one is using it on a daily basis.
- Among the respondents who use the e-markets majority of the respondents make their payment through debit cards. Of the total respondents 51.22% of the respondents use debit cards, 46.34% of them use credit cards as their mode of payment, 2.44% of them use e-payments as their payment system.
- Out of total respondents 41.46% of them prefer e-markets because of time saving, 36.58% of them prefer for easy accessibility, 14.63% of them prefer it for quick response and 7.31% of them prefer for its cost minimization. Some of the respondents have preferred more than one factor as their preference for the e-markets.
- Among the total respondents, 41.90% of the respondents are not aware of cyber laws, 32.38% of the respondents are aware of cyber laws and the balance 25.71% of them have a partial knowledge about cyber laws.
- Of the total respondents 70.73% of the respondents felt that the goods or services delivered through e-markets are good. 17.07% of the respondents were satisfied with regard to delivery of goods and services through e-markets and 12.19% respondents felt that the goods and services rendered by e-markets as bad.
- Of the total respondents 48.78% of them were associated with e-markets for less than one year. 41.46% of the respondents were using the e-markets for the past 1 to 3 years. 9.75% of them were using the e-markets for the past 3 to 5 years.
- Among the total respondents 65.85% of them are highly satisfied with e-markets followed by 21.95% of the respondents are satisfied and the balance 12.19% of them are not satisfied through e-markets.

SUGGESTIONS

- As only few people are using e-markets basically awareness is to be created about e-markets and are to be encouraged to use e-markets.
- Special programs may be organized to bring awareness with regard to cyber laws, as majority of the people are unaware of it.
- Electronic and print advertisements may be given to make the people aware of various products and services available through e-markets.
- The cost of services may be reduced so that more number of people can avail the services.
- The government should take steps in order to solve the technical problems of internet services.

LIMITATIONS OF THE STUDY

1. Sample being convenience sampling, which may not be true representative of the actual population.
2. There might be a chance of bias crept in the answers given by the respondents.
3. The respondents might not have furnished correct information.
4. The study is confined to Kurnool city.

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MENTAL HEALTH PERSPECTIVES IN ORGANIZATIONS: ISSUES AND CHALLENGES

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ABSTRACT

Recent years have evinced growing concern about the mental health which is an integral part of health. In a positive sense, it is the foundation for well-being and effective functioning of an individual and a community. Mental Health, as a discipline, doesn't finds it's virtual presence in organizational behaviour and thus lacks significant attention in organizations. This paper tries to offer a comprehensive view on the mental health perspectives in organizational context. Moreover, it highlights the need for mental health policies and programmes in organizations for the comprehensive welfare of the employees.

KEYWORDS
Mental Health, Well- being.

INTRODUCTION

Recent developments in information technology and communication have significantly changed human lifestyles. They have literally wiped out the boundaries between the nations and converted the world into a global village. "Human Being" as an active bio- psycho- social unit is absorbing and responding to these changes and as a result is showing varied adaptive patterns. The information revolution is creating a new type of social order where the psyche of concerned population will show decisively new set of behavioural patterns (Jain, 2003). As people in the contemporary world of today are facing an increasing number of chronic psychosocial and other stressors that impinge on their overall well- being and quality of life, the psycho- social implications of these advancements particularly in the health sector need an in depth study.

Every human being from birth faces a succession of changing circumstances in the environment. But the way he/ she reacts to these changes determines the pattern of his/ her personality and the quality of his/ her mental health. In this context, Annual Report of World Federation of Mental Health (1950) conceived mental health as "not merely the absence of mental disorder but as a state in which the individual lives harmoniously with himself and others, adapting to and participating in an ever- changing social setting and with the sense that he/ she is achieving self- realization through satisfaction of his basic needs". Singh (2003) observed that good mental health is basic to positive health and well- being. In the present circumstances it becomes imperative to help the individuals to manage their lives successfully and provide them the emotional and spiritual resilience and to allow and enjoy life successfully dealing the distress and disappointments. Anaparti & Chintalapuri (2009) studied the psycho- social impact of computer technology on eighty software professionals from Hyderabad and assessed their mental health. In the study, it was found that they appear to have average to low mental health. Such a trend in the status of their well- being requires special attention on this unattended topic in management and organizational behaviour specifically.

In nutshell, it can be mentioned that mental health has specific value in itself, is integral to health and is the foundation for well-being and effective functioning for individuals and populations. In this scenario, promoting mental health is justified in itself as well as through its efficacy in helping to achieve other objectives such as increased productivity. While these benefits are important and may be decisive in terms of resource allocation, the promotion of mental health is fundamentally linked to human rights and equity as well as overall humanitarian and utilitarian values.

MENTAL HEALTH

Since its inception, WHO has included mental well- being/ mental health in the definition of health. WHO famously defines health as: ….. a state of complete physical, mental and social well- being and not merely the absence of disease or infirmity (WHO, 2001b,p.1). Three ideas central to the improvement of health follow from this definition: (i) mental health is an integral part of health, (ii) mental health is more than the absence of mental illness, and (iii) mental health is intimately concerned with connected with physical health and behaviour.

Defining mental health is important, although not always necessary to achieving its improvement. Differences in values across countries, cultures, classes and genders can appear too great to allow a consensus on a definition (WHO, 2001c). Without restricting its interpretation across cultures, mental health can be clearly understood. WHO has recently proposed that mental health is: … "a state of well- being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO, 2001d, p.1). The mental health practitioners across the globe consider the concept of positive mental health and refer it to the individual having a positive sense of well-being, resources such as self-esteem, optimism, sense of mastery and coherence, satisfying personal relationships and resilience or the ability to cope with adversities. These qualities enhance the person's capacity to make a meaningful contribution to their family, community and society (Lavikainen, Lahtinen & Lehtinen, 2000).

According to Mathur(2007), there is no single universally acceptable definition of mental health. For example, the layman's concept of mental health is absence of mental illness or a negation of any mental trouble. Thus, the disturbances of the mind have something to do with the mental illness. But, the concept of mental illness goes much beyond the layman's concept. Meaning of mental health does not imply mental health in terms of mental disorders only, nor does it imply that mental health and mental disorders are opposite poles on a single continuum. Absence of mental ill health is not the same as having good mental health. The factors that contribute to positive mental health are manifested in a general feeling of well- being, self confidence, personal competence, satisfaction, happiness and ego- strength. The negative mental health factors could be manifested as mental disorders or symptoms like anxiety, depression, obsession, compulsion, phobias, delusions, or even negative states like anger, hostility, dissatisfaction, fear, inferiority, etc. Kovess- Masfety, Murray & Gureje (2005) conceptualized mental health as a positive emotion (affect), such as feelings of happiness; as a personality trait inclusive of the psychological resources of self-esteem and mastery; and as resilience, which is the capacity to cope with adversity.

Mental health is an indivisible part of general health and well-being. In principle, mental health refers to the characteristics of individuals, but we can also speak about the mental health of families, groups, communities and even societies. Mental health as a concept reflects the equilibrium between the individual and the environment in a broad sense. Here the determinants are grouped into four categories (see Fig. 1): individual factors and experiences, social support and other social interactions, societal structures and resources, and cultural values (Lahtinen et al., 1999).

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**FIG. 1: THE STRUCTURAL MODEL OF MENTAL HEALTH**

Source: WHO, 2005

As the arrows in the figure (Fig. 1) show, the influences between mental health and its determinants are reciprocal. Thus, one can also speak about a "systemic" model of mental health. Furthermore, physical and mental health is also tightly connected. This is reflected in figure 1 which shows the so-called "structural" model of mental health. Spiritual or religious values also contribute to mental health. Although they can overlap with cultural values, religious or spiritual values are often not the same as those of the specific culture. They can have both positive and negative effects on mental health in the same way as other determinants. An example of a positive spiritual value might be the assumption that each individual is of great worth apart from their functional capacity. In short, WHO defines mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO, 2001a).

MENTAL HEALTH CONTRIBUTES TO SOCIAL CAPITAL

One way of looking at the relationship between mental health and the society is through the concept of social capital (Putnam, 1993). This concept refers to features of social life such as institutions, networks, norms, reciprocity and social trust that shape the quality and quantity of social interactions and facilitate collective action, coordination and mutual benefit. Increasing evidence shows that social cohesion is critical for societies to prosper economically and for their development to be sustainable. Aspects of social capital, like trust, social support and social networks, are also important determinants of the mental health of individuals. Furthermore, it is evident that social capital can improve access to services for people with mental disorders and so shorten the duration of these disorders (Sartorius, 2003). The relationship between mental health, its consequences and organizations as part of social capital is demonstrated in figure 2.

FIG.2 : MODELING THE IMPACT OF MENTAL HEALTH ON SOCIAL CAPITAL
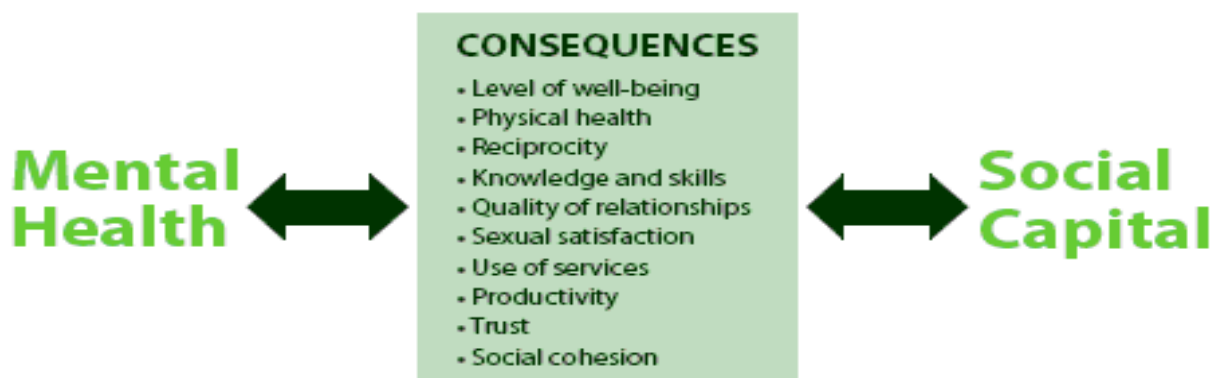
Source: WHO, 2005

The social capital–mental health relationship should be a key consideration in the promotion of mental health because mental health is a key input to human productivity. This knowledge should be used in the development of any social policy aiming to enhance social capital. There are experiences of the development of mental health service resources and systems that have had favourable impact in the restructuring of societies in crisis. We need more systematic research to deepen our knowledge on these associations, however, in order to be able to provide useful recommendations for planning and implementation of new service strategies.

Research over the last two decades has demonstrated that social capital is linked with economic development, the effectiveness of human service systems and community development. Social capital has also been shown to decrease transaction costs in the production and delivery of goods and services, thereby improving productivity and efficiency. Political scientists have studied the contribution of social capital to the functioning of democracy, more efficient government, decreased corruption and the reduction of inequality within a society. Social scientists have investigated how higher social capital may protect individuals from social isolation, create social safety, lower crime levels, improve schooling and education, enhance community life and improve work outcomes (Woolcock, 1998).

Contrary to the West, the Hindu philosophy does not believe in the dichotomy of mind body problem. Instead the Hindu philosophy presents ideal picture of a healthy man which does not correspond to contemporary social realities. The mental health often known as quality of life (Wig, 1979) is not the mere absence of mental illness but something different (Nagaraja, 1983) like ideal social functioning (Carstairs and Kapoor, 1976) and, by and large, can be an integrated component of public health and social welfare programme (Larson, 1978; Okun and Stock, 1984; Sandvik, Diener and Seidltz, 1993; Umberson and Gove, 1989). All these approaches to well- being are like a few passing references (Michael, 1982) which only suggest a variety of mental healths but fail to generate a composite view of the same (Sathyavati, 1988; Sinha, 1990). Jahoda (1958) characterised mental health as the positive condition that is driven by a person's psychological resources and desires for personal growth. She described six characteristics of the mentally healthy person: (i) A personal attitude toward self that includes self- acceptance, self- esteem, and accuracy of self- perception; (ii) The pursuit of one's potentials; (iii) Focused drives that are integrated into one's personality; (iv) An identity and values that contribute to a sense of autonomy; (v) World perceptions that are accurate and not distorted because of subjective needs; and (vi) mastery of the environment and enjoyment of love, work, and play. In the same context, psychological researchers have referred the capacity to love, work, and play as "mental health" (Cederblad, Dahlin, Hagnell, & Hansson, 1995).

There exist many misconceptions among the general public, politicians and even professionals regarding the concept of mental health. This is due to the fact that mental health is in many ways undervalued in our societies. The concept is often confused with severe mental disorders and associated with societal stigma

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and negative attitudes. It is also often the case that curative medicine focusing on health problems attracts more attention than public health questions of prevention and, even more so, of promotion. The positive value of mental health, contributing to our well-being, quality of life and creativity as well as to social capital, is not always seen.

WELL- BEING

Well- being is not a "default" concept, and is currently defined in positive terms. It has a range of physical, psycho- social, and socio- cultural dimensions. According to WHO (2001b), health is a state of complete physical, mental and social well- being, and is not merely the absence of disease and infirmity. This way well- being is a broader construct much beyond the mere physical well- being. Such an emphasis on harmony/ balance or equilibrium is very close to the concept of health in various Indian texts. The related illustrations include *Ayurveda* (the concept of *sama* or balance); *Ati sarvatra varjayet* or avoidance of extremes; Buddhistic philosophy (*madhyama* or the middle path); or on *Sankhya philosophy*- state of *samyavastha* (equilibrium) of three *gunas* or qualities namely *sattva* (the element of illumination); *rajas* (activity, dynamism); and *tamas* (passivity, inertia, darkness). Such a balanced state of functioning is repeatedly considered in *Bhagvadagita* to be the chief characteristic of psychological well- being of a person (see Palsane *et al.*, 1986; Sinha, 1990). The feeling of well- being provides a subjective dimension of the quality of life. It is a cognitive- affective awareness of one's own life. Being a subjective measure it is a good index of a person experiencing his own situation; how satisfied and effectual in living one feels (Asthana, 2009).

The most acceptable definition of health given by WHO is "Health is the state of complete physical, mental, social and spiritual well- being, and not merely an absence of disease or infirmity" (WHO, 1978). It is a significant departure from the medical model. It is a definition of positive health and goes beyond the mere absence of a disease: the focus being on maintaining good health, rather than on the treatment of different diseases. This also makes health a multidimensional concept having four dimensions i.e. physical, mental, social, and spiritual. The spiritual dimension of health was added much later in the WHO definition. In the backdrop of the expanded definition of health, the terms health and well- being are often used interchangeably. Well- being comprises people's evaluations, both affective and cognitive, of their lives (Diener & Suh, 1997). According to Dalal & Misra (2006), well- being is an outcome of a complex array of biological, socio- cultural, psychological, economic and spiritual factors. The conceptualization of the state of well- being is closer to the concept of mental health and happiness, life satisfaction and actualization of one's full potential. It is the subjective feeling of contentment, happiness, satisfaction with life's experiences and of one's role in the world of work, sense of achievement, utility, belongingness, and no distress, satisfaction or worry, etc.

WELL- BEING & MENTAL HEALTH

Mental health and well-being are issues of everyday life: in families, in schools, on streets and in workplaces. Therefore they should be of interest to every citizen, to every politician and to every employee as well as to all sectors of society. This includes sectors such as education, employment, environment, housing and transport as well as health and social welfare. Many civil society organizations have taken an active role in the field of mental health. Mental health, social integration and productivity are linked: well-functioning groups, societies, organizations and workplaces are not only healthier but also more effective and productive. However, the main reason for promoting good mental health is its great intrinsic value.

QUALITY OF LIFE

Quality of life has to be added to any conceptual framework of positive mental health. Early attempts to bring "quality of life" and "social well-being" to a discussion about the value of population life were made not by health practitioners but by social scientists and philosophers in the 1960s and 1970s (Campbell, Converse & Rodgers, 1976; Erickson, 1974; Katschnig, 1997). The definition of quality of life provided by WHO (WHOQOL Group, 1995) as "an individual's perception of his/her position in life in the context of the culture and value systems in which he/she lives, and in relation to his/her goals, expectations, standards and concerns" reflects a broad view of well-being encompassing social indicators, happiness and health status. It is a definition to which many in the field of mental health can relate as it gives voice to the hitherto voiceless mentally ill and emphasizes the interaction between personal and environmental factors in health. It also reflects the utility of the concept of quality of life for describing health, including mental health, in terms that go beyond the presence or absence of symptoms and signs of disorders and captures positive aspects of coping, resilience, satisfaction and autonomy, among others.

MENTAL HEALTH INDICATORS

Authorities around the world are moving to initiate scientific trials and evaluations, assess evidence, develop policies and implement programmes of intervention to prevent mental disorders and maintain or improve levels of positive mental health (CDHAC, 2000). These approaches require measurements and indicator frameworks relevant and responsive to the interventions and methods of mental health promotion. There is certainly a place for epidemiological measurement of mental disorders and many well-developed instruments with which to do this. Such measures are essential where mental health promotion and prevention programmes seek to prevent or reduce illness or disorder. However, the absence of a mental illness or disorder does not necessarily result in a "state of well-being in which the individual realizes his or her own abilities, copes with the normal stresses of life, works productively and fruitfully, and makes a contribution to his or her community" (WHO, 2001, p. 1). Individuals without a mental illness or disorder have varying degrees of well-being and hence differing levels of abilities to cope with the normal stresses of daily living. These are the aspects of positive mental health for which indicators are sought.

A SOCIAL-ECOLOGICAL FRAMEWORK FOR POSITIVE MENTAL HEALTH

When proposing mental health indicators, the different perspectives of health promotion practitioners and mental health practitioners need to be appreciated. For health promotion practitioners, health promotion is a process of development that addresses determinants, strategies and specific levels of action (Evans & Stoddart, 2003; Hamilton & Bhatti, 1996). These in turn should have a clear evidence base that draws upon research, experience and evaluation. Critically, the entire model rests upon stated values and assumptions (see figure 3).

FIG.3: THE SCOPE OF HEALTH PROMOTION
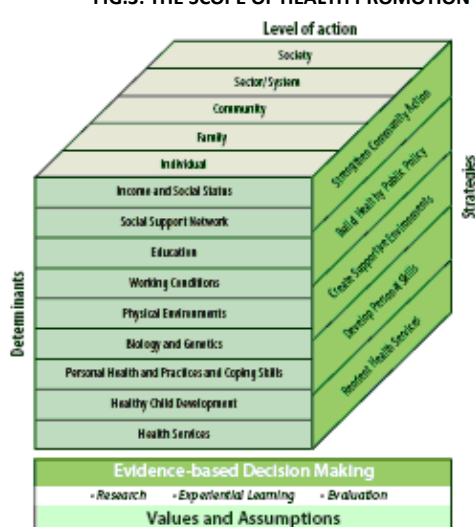
As Lahtinen et al. (1999, p. 11) state: Promotion of mental health puts special emphasis on participation and empowerment and on intersectoral cooperation. It can work with whole societies, communities, social groups, risk groups or individuals. Action aiming at promoting mental health underlines and highlights values supporting sustainable development. The health promotion approach is particularly congruent with a population perspective. For mental health practitioners, mental health is first and foremost an individual developmental process best understood over the lifecourse. As a developmental process the expression of individual positive mental health is nested within specific cultural, historical, sociopolitical and economic settings. Within these broad settings, positive mental health is conditioned by specific neighbourhood, school and community influences that intersect with families, peers and individuals.

The individuals themselves bring their own developmental characteristics and capacities – genetic, behavioural and social – which interact with and within these larger systems. As a consequence, like other complex health outcomes, an individual's mental health is multiply determined, with causal pathways that more often than not lie outside the control or jurisdiction of health and mental health systems. The significance of this is paramount when trying to establish a response to address the growing burden of mental health problems and disorders. The services responsible for responding to the growing demand for treatment are not necessarily responsible for or equipped to address preventive strategies (Zubrick et al., 2000b).

Source: Evans & Stoddart, 2003

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MENTAL HEALTH IN ORGANIZATIONAL CONTEXT

According to WHO (2003), in many developed countries, 35% to 45% of absenteeism from work is due to mental health problems. In the United States alone, mental illness is considered responsible for an estimated 59% of the economic costs deriving from injury or illness-related loss of productivity, followed by alcohol abuse at 34% (Rouse, 1995). A report from a Canadian university (Université Laval, 2002) revealed that absences for psychological reasons had increased 400% from 1993 to 1999, and that the costs of replacement, together with those of salary insurance, amounted to Can$ 3 million for the year 2001. A recent study from Harvard Medical School examined the impact of psychiatric disorders on work loss days (absence from work) among major occupational groups in the United States (Kessler & Frank, 1997). The average number of work loss days attributable to psychiatric disorders was 6 days per month per 100 workers; and the number of work cutback days (getting less done than usual) was 31 days per month per 100 work- ers. Although the effects on work loss were not significantly different across occupations, the effects on work cutback were greater among professional workers. Work loss and cutback were found to be more prevalent among those with comorbid disorders than among those with single disorders. The study presents an annualized national projection of over 4 million work loss days and 20 million work cutback days in the United States. Now the same trend is gaining prominence in the developing countries like India as well.

Physical health and mental health are closely associated through various mechanisms. Physical health is detrimental to mental health as much as poor mental health contributes to poor physical health (Herrman & Jane- Llopis, in press). The notion that hypertension may arise through psychological stress, in turn related to occupational and other adverse factors in the environment, remains contentious, but the idea is an old one (Esler & Parati, 2004). Low control at work and poor social support have important influences on both physical health (e.g. cardiovascular morbidity) and psychological health (e.g. depression) (Kopp, Skrabski & Szedmak, 2000). Mental health for each person is affected by individual factors and experiences, social interaction, societal structures and resources and cultural values. It is influenced by experiences in everyday life, in families and schools, on streets and at work (Lahtinen et al., 1999; Lehtinen, Riikonen & Lahtinen, 1997). Singh & Singh (2007) concluded that both positive and negative job stresses affect the mental health status of the executives. Job negative stress adversely affects the mental health whereas job positive stress boost up the mental health. Results also indicate that personal life events have little impact on mental health of managers. Thus, stress significantly affects the health status of managers and coping has a somewhat moderating effect in stress-health relationship. According to WHO (2003), decreased productivity at work: even if an employee does not take sick leave, mental health problems can result in a substantial reduction in the usual level of activity and performance. Moreover, mental illness affects access to the job market and job retention.

Mental health and well-being are issues of everyday life: in families, in schools, on streets and in workplaces. Therefore they should be of interest to every citizen, to every politician and to every employee as well as to all sectors of society. This includes sectors such as education, employment, environment, housing and transport as well as health and social welfare. Many civil society organizations have taken an active role in the field of mental health. Mental health, social integration and productivity are linked: well- functioning groups, societies, organizations and workplaces are not only healthier but also more effective and productive. However, the main reason for promoting good mental health is its great intrinsic value. However, the positive value of mental health, contributing to our well-being, quality of life and creativity as well as to social capital, is not always seen.

THE WORKPLACE

Workplaces are increasingly heralded as significant settings for attention and action by international bodies. The World Federation for Mental Health set the workplace as its focus for two consecutive World Mental Health Days in 2000 and 2001. This action identified the workplace and the role of employers as key entry points for promoting mental health and creating healthy environments. The global collaborative partnerships between WHO and the International Labour Organization (ILO) also highlight, through policy, practice and research, the importance of workplaces and employment in promoting mental health. WHO identifies three main issues for employment:

1.   Creating a positive work environment free from discrimination, with acceptable working conditions and employee assistance programmes;
2.   Integrating people with severe mental illness into the workforce; and
3.   Adopting policies that encourage high levels of employment maintain people in the workforce and assist the unemployed (WHO, 2000, p.102).

This represents a broad view of the role of work for mental health and well-being. Not only does it identify the role of conditions within the workplace but also the importance of meaningful employment itself for positive mental health. The rationale for a focus on the workplace is clear:

There is a need among employers to recognize mental health issues as a legitimate workplace concern. As disability costs and absenteeism increase in the workplace due to mental ill health (whatever the precipitating factors), more and more employers are faced with the challenge of developing policies and guidelines to address these issues (WHO, 2000, p.21). Following key factors have been found to impact on workplace environments and employees: work schedule and flexibility; positive relationships with work colleagues; job satisfaction and security; job design and degree of autonomy; employee role status and degree of decision-making and planning; general management style and organizational culture; organization change; communication; and social, environmental and physical factors (ILO, 2001; WHO, 2000). The past 30 years have seen significant workplace health improvements in some countries in respect of physical and toxic hazards, and workplace health promotion initiatives that have helped to encourage healthier behaviours by individuals. However, the situation in many low income countries remains severe in the face of human rights abuses such as forced labour and child labour. These abuses require a range of political and social interventions beyond the workplace as well as within. Even in affluent countries the social and psychological demands of work are increasing. These demands arise from managerial decisions that in turn are constrained by the wider economic, political, social and political environment (Polanyi et al., 2000). Even within the workplace, successful promotion of mental health must extend beyond the traditional boundaries of occupational health and individually focused health promotion strategies. Neither the provision of a safe physical environment nor the promotion of a healthy lifestyle is sufficient. It is now time to: … tackle the bigger, more controversial task of creating healthier workplaces that can create the working conditions necessary for good health. This will require the difficult task of striving to balance economic strength, social equity and for survival over the longer term, environmental sustainability (Polanyi et al., 2000, p.155). Such a move in no way negates the need for occupational health strategies or workplace health promotion programmes but rather calls for a greater emphasis than there is at present on organizational and societal determinants of worker health. A more comprehensive approach incorporating inter-related strategies is required. Employers who provide safe and supportive work environments for all their staff can do more than prevent stress and injury: they can provide mentally healthy environments which will promote mental health and potentially improve performance and productivity (McKernon, Allen & Money, 2002).

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Case study 20.3
Developing a healthy workplace – The Clifford Beers Foundation

The creation of a safe, healthy and supportive work environment is a vital component of an effective organization. The mental health of employees is essential for both their well-being and for the effective operation of the organization.

The most significant research in this area is in the context of how the organization of work can induce stress that in turn affects both health and productivity. The scientific evidence on stress, health and performance has concentrated on two paradigms:

- the Demand/Control Model (Karasek & Theorell, 1990)
- the Effort/Reward Imbalance Model (Siegrist, 1996).

The essence of these models is that too much demand coupled with too little job control and too much effort coupled with too little reward are stressors complicit in the production of numerous types of illness and injury. These harms range from the common cold to cancer and include injuries such as repetitive strains and back problems. Increasingly, it appears that both pairs of conditions are likely to co-exist in the same workplaces.

The Clifford Beers Foundation (www.charity.demon.co.uk) has developed a framework to assist employers to engage and interact with staff to address these issues. The framework calls for the concept of the healthy workplace to be an integral component of the business place and for:

- a broad-based commitment of workers and management in all stages;
- a partnership which permits all participants to address a full range of issues;
- targeting of health issues which are a priority of workers;
- researchers to act as technical resources and facilitators (e.g. to help answer, "what works?" and "what doesn't?");
- long-term commitment; and
- evaluation.

Results from the programme have demonstrated how the meaningful involvement of staff in decision-making about their own health and welfare at work leads to higher levels of satisfaction and reduced stress levels.

Source: WHO, 2005

Promoting health and mental health in the workplace has developed as a priority from evidence that employers who attend to their responsibilities to be good employers and provide supportive work environments have reduced absenteeism, less workplace stress, fewer accidents, less staff turnover and higher performance. The work of the Clifford Beers Foundation (case study 20.3) in developing a research-based conceptualization of mental health and the workplace offers clear directions for policy development. It emphasizes that effective practice involves partnerships between employers and staff. Likewise, case study 20.4 shows the value of creating a shared agenda for mental health improvement that acknowledges the priorities of the employers for profit and productivity increases as well as organizational change.

Case study 20.4
Working Well – A practical guide to building mentally healthy workplaces

Based on the growing interest by employers in the area of workplace health and requests for information on how to support staff with mental health related problems, the New Zealand Mental Health Foundation developed a workplace mental health toolkit, "Working Well" (MHF, 2002). In its development phase, the Foundation market-tested the content and format of the toolkit. This consultative process drew on the wisdom and practices of the private sector partners, identifying that employers wanted practical and helpful tools that improved productivity. This process also enabled employers to see that a mentally healthy organization was also potentially a more enjoyable and profitable one.

The consultative process will hopefully contribute to relevance and sustainability of the resource and the partnerships. Alongside the resource, tailored training programmes and employer forums are expanding the programme of activity in response to employer feedback. The goal is to create a community of mentally healthy employers in New Zealand. The following table outlines some of views on mental health of staff and employers.

Definitions of mental health at work	Examples of being mentally healthy	Mentally healthy team and workplace culture
- Accounting for people's feelings - Communicating effectively - Having satisfying workplace relationships - Dealing with difficulties quickly and efficiently	- Communicating and relating – being able to express one's feelings, understand others and maintain good relationships - Balances between work and home life - Informal mentoring, mediating and counselling roles - Taking responsibility and initiative - Getting the company to provide a good working environment	- Trust - Friendship - Practical support with problems - Shared goals and values - Equality - Effective teamwork - Rapid resolution of conflict and difficulties

Adapted from MHF, 2002

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Within the spectrum of mental health interventions, prevention and promotion have become realistic and evidence based, supported by a fast growing body of knowledge from fields as divergent as developmental psychopathology, psychobiology, prevention, and health promotion sciences (WHO, 2002). Prevention and promotion programmes have also been shown to result in considerable economic savings to society (Rutz et al., 1992).

MENTAL HEALTH PROMOTION

In theory, the aim of mental health promotion is to increase and enhance positive mental health and that of mental ill-health prevention is to protect individuals from mental health problems. In practice, however, many activities have both promotive and preventive effects. Health promotion is the process of enabling people to gain increasing control over their health and improve it (WHO, 1986). It is therefore related to improving the quality of life and the potential for good health, rather than only an amelioration of symptoms (Secker, 1998).

Global attention is now focused on the development of strategies to reduce mental ill-health and promote mental health and well-being. A focus on social and economic determinants of mental health in our health promotion efforts should not only result in lower rates of some mental disorders and improved mental health but also improved physical health, educational and work performance, relationships and community safety. Conceptual and practice frameworks to progress work in the promotion of mental health and well-being have been developed over the last decade in a number of countries, including Finland, the United Kingdom and New Zealand. A framework that has been developed by the Victorian Health Promotion Foundation (VicHealth) in Australia to address the key socioeconomic determinants of mental health provide an insight into it.

THE VICHEALTH FRAMEWORK TO PROMOTE MENTAL HEALTH AND WELL-BEING

At the International Primary Health Care Conference held in Alma-Ata in 1978 a declaration was made in which health was reaffirmed as a human right, the role of social and economic sectors in promoting health was illuminated and health inequalities were termed politically, socially and economically unacceptable. The ensuing Alma-Ata Declaration and Ottawa Charter for Health Promotion introduced a social model of health promotion that is now a common feature of health promotion practice. Robertson and Minkler (1994) suggest that some two decades since the development of the influential Ottawa Charter, prominent features of contemporary health promotion include:

- broadening the definition of health and its determinants to include the social and economic context in which health or ill-health is produced;
- going beyond the earlier emphasis on individual lifestyle strategies to achieve health to broader social and political strategies;
- embracing the concept of empowerment, individual and collective, as a key health promotion strategy; and advocating for the participation of the community in identifying health problems and strategies for addressing those problems.

It was in this context that VicHealth developed its framework for the promotion of mental health and well-being (VicHealth, 1999). As shown in figure 4, the framework begins with acknowledgement of three key determinants of mental health: social inclusion, freedom from discrimination and violence, and access to economic resources. Health promotion actions that address these determinants can be carried out with different populations, through involvement with different sectors and in varying settings. Health promotion methodologies are used to secure intermediate outcomes (increased sense of belonging; safe, supportive and inclusive environments; accessible and responsive organizations; supportive and integrated public policy; and a strong legislative platform). These are expected to result in improved mental health as well as less substance misuse, improved physical health and productivity and other longer-term outcomes.

FIG.4: VICHEALTH'S FRAMEWORK FOR THE PROMOTION OF MENTAL HEALTH AND WELL-BEING
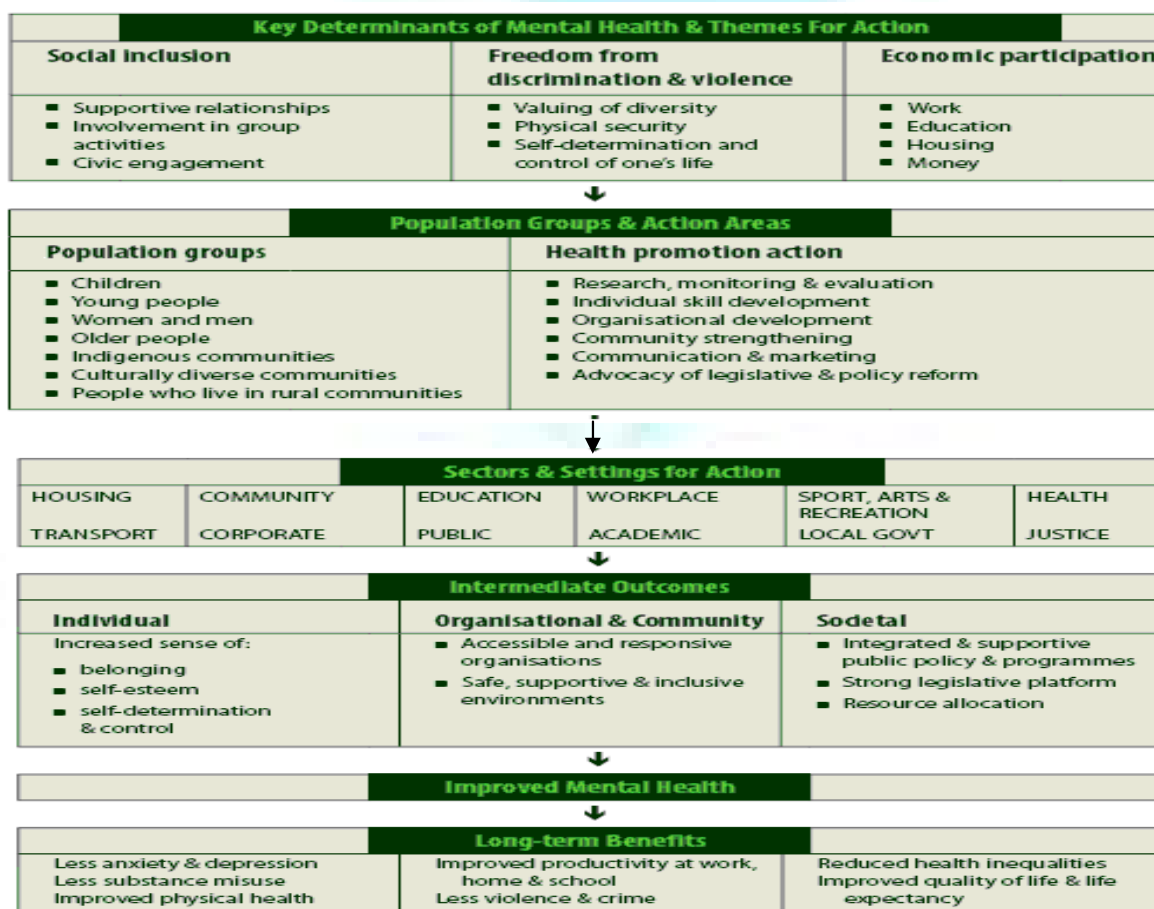
Source: VicHealth, 1999

Mental health promotion needs to be integrated as an important part of policy to give it the status and strategic direction required for it to be implemented successfully. As discussed elsewhere in this volume, the goals of mental health promotion are not the sole responsibility of the mental health sector. Many other sectors have the potential to positively impact on the mental health of the community. Mental health policy should have a role in advising other sectors on how

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to promote mental health. Many mental health promotion activities can (and should) be funded from other budgets and coordinated through a mental health policy or plan. Moreover, mental health promotion is now widely understood as an integral part of health promotion, a key principle of which is intersectoral action. A number of seminal WHO documents – the Declaration of Alma-Ata (WHO, 1978), the Ottawa Charter for Health Promotion (WHO, 1986) and the Jakarta Declaration (WHO, 1997a) – advocate for intersectoral action for health. The sectors, settings and organizations outside health have enormous capacity to affect health, including mental health and well-being. Modifying the determinants of health and intervening, for example, to enhance social inclusion, ensure freedom from discrimination and violence and improve access to economic resources, will not be achieved by health sector action alone. The complexity of the sociopolitical and economic determinants of mental health can only be accommodated by collaborative practice.

INTERSECTORAL COLLABORATION – MAKING HEALTH PROMOTION WORK

Mental health promotion depends on the expertise, resources and partnerships formed across all sectors and disciplines. Multisectoral action is fundamental and requires serious discussion and a clear understanding, acceptance and statement of the distribution of roles and responsibilities between different government sectors/ministries. Achieving multisectoral collaboration is challenging as the different sectors attempt to work towards a shared goal within differing cultural and organizational structures. A number of key success factors for intersectoral collaboration can be identified. The engagement of key stakeholders at the beginning of the process is essential. The process of formulating a mental health policy and identifying mental health promotion interventions provides an opportunity to ensure all partners share a commitment to a common goal. Intersectoral collaboration requires broad policy support from a wide range of health and social policies. The inclusion of mental health promotion goals within a broad policy framework assists in obtaining the political support necessary for successful collaboration. Collaboration should include both horizontal linking (that is, linking mental health with the health, education, employment, social welfare, justice, user and family sectors) and vertical linking (that is, linking national, regional and local networks). A focus on concrete objectives and achieving results rather than setting up complex collaboration structures assists in keeping stakeholders committed and motivated. It is essential that the agenda is guided by the goals of the collaboration rather than the interests of a few stakeholders. Collaboration needs to develop over time. Policy assists in providing clear guidance on the roles and responsibilities of each partner and provides concrete strategies to achieve objectives. Finally, it is essential to invest in the alliance. Effective collaboration requires time and resources (Advisory Committee on Population Health, 1999).

STRATEGIES FOR MENTAL HEALTH PROMOTION

Mental health promotion works at three levels: strengthening individuals, strengthening communities and reducing structural barriers to mental health. At each level it is relevant to the whole population, to individuals at risk, to vulnerable groups and to people with mental health problems (mentality, 2003). Other examples of strategies that could be considered for inclusion in mental health policies at each of the three levels are described below.

STRENGTHENING INDIVIDUALS

This involves strengthening individuals and their emotional resilience through interventions designed to promote self-esteem and life and coping skills such as communicating, negotiating, relationship and parenting skills. Examples of mental health promotion activities that aim to strengthen individuals include mother-infant programmes and life skills programmes for children (Department of Health, 2001).

STRENGTHENING COMMUNITIES

Strengthening communities involves increasing social inclusion and participation, improving neighbourhood environments, developing health and social services which support mental health, implementing anti-bullying strategies at schools, improving workplace mental health, ensuring community safety, providing childcare and encouraging self-help networks (Department of Health, 2001).

WORKSITE PROGRAMMES

There is a growing awareness of the role of work and the potential of the work environment to promote mental health. While there is a strong positive relationship between having work and good mental health, the work environment itself can also mediate the positive effects of personal identity, self-esteem and social recognition. This is not surprising given that a large number of people spend most of their adult life in a work environment. A number of areas of action have been identified: increasing an employer's awareness of mental health issues, identifying common goals and positive aspects of the work process, assessing workload, creating a balance between job demands and occupational skills, enhancing job control and decision-making latitude, enhancing social support and training in social skills, developing the psychosocial climate of the workplace and providing counselling and early rehabilitation strategies (mentality, 2003; Williams, Michie & Pattani, 1998).

REDUCING STRUCTURAL BARRIERS TO MENTAL HEALTH

Structural barriers to mental health can be addressed through initiatives to reduce discrimination and inequalities; promote access to education, meaningful employment, housing and health services; and provide support to those who are vulnerable (Department of Health, 2001). Some examples are given below.

MENTAL HEALTH PROMOTION AND THE PREVENTION OF MENTAL DISORDERS

Although mental health promotion and the prevention of mental disorders have overlapping and related properties, they are derived from different conceptual principles and frameworks. Mental health promotion focuses on positive mental health and, in the main, on the building of competences, resources and strengths, whereas the prevention of mental disorders concerns itself primarily with specific disorders and aims to reduce the incidence, prevalence or seriousness of targeted problems (Barry, 2001). Mental health promotion is not primarily about the prevention of mental disorders but is a desirable activity in itself and has a major contribution to make to promoting personal and social development (Orley & Birrell Weisen, 1998).

ISSUES & CHALLENGES

In the context of the above discussion, we need to have a comprehensive mental health promotion. The evidence is clear: mental health is fundamentally linked to physical health outcomes. Mental health status is a key consideration in changing the health status of a community. Health and behaviour are influenced by factors at multiple levels, including biological, psychological and social. Interventions that involve only the individual, such as training in social skills or self-control, are unlikely to change long-term behaviour unless family, work and broad social factors are aligned to support a change (Institute of Medicine, 2001).

International collaboration is crucial for vigorous and successful advocacy as well as for the actions that follow. WHO is the lead international agency responsible for health and is increasingly recognizing the value of mental health. The WHO Constitution stipulates a number of core functions that include: "To foster activities in the field of mental health, especially those affecting the harmony of human relations"; and "To assist in developing an informed public opinion among all people on matters of health" (WHO, 2005).

Health promotion is an emerging field of action, often referred to as the "new" public health (Baum, 1998). The WHO Ottawa Charter of Health Promotion provides the most widely cited definition of health promotion (WHO, 1986). It places emphasis on the idea that the promotion of health is a process that requires broad participation.

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Ottawa Charter of Health Promotion Action Strategies

■ Build healthy public policy

Health promotion goes beyond health care. It puts health on the agenda of policy-makers in all sectors and at all levels, directing them to be aware of the health consequences of their decisions and to accept their responsibilities for health.

■ Create supportive environments

The inextricable links between people and their environment constitute the basis for a socio-ecological approach to health. Systematic assessment of the health impact of a rapidly changing environment is essential and must be followed by action to ensure positive benefit to the health of the public. The protection of the natural and built environments and the conservation of natural resources must be addressed in any health promotion strategy.

■ Strengthen community action

Health promotion works through concrete and effective community action in setting priorities, making decisions and planning strategies and implementing them to achieve better health. At the heart of this process is the empowerment of communities, their ownership and control of their own endeavours and destinies.

■ Develop personal skills

Health promotion supports personal and social development through providing information and education for health and enhancing life skills. By so doing, it increases the options available to people to exercise more control over their own health and over their environments and to make choices conducive to health.

■ Reorient health services

The responsibility for health promotion in health services is shared among individuals, community groups, health professionals, health service institutions and governments. They must work together towards a health care system that contributes to the pursuit of health.

Source: WHO, 1986

Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being. This definition covers wide territory indeed, including as it does environmental and well as individual factors in the range of resources that define health. The obvious implication is that the promotion of health must have foci on both the individual and the environment. This calls for the involvement of a much broader array of interventions and actors than does the traditional medical model. Indeed, many of the determinants of health are beyond the control of the health care system, as described next.

In the context of the above chalked out programme, developing personal skills and creating supportive work environments need to be given prior emphasis at work place in organizational context. Putting this intention into practice in an ethical and effective manner requires complex professional skills in conducting recurrent cycles of programme planning, implementation and evaluation through which the quality and effectiveness of health promotion are enhanced over time (Davies & Macdonald, 1998; Minkler, 1997). Many practice models are available to assist health promoters, such as Green and Kreuter's (1999) PRECEDE–PROCEED model, intended for use in communitywide applications and also within community settings such as workplaces and schools. A number of other models are also in wide use (Baum, 1998; Dines & Cribb, 1993; Katz & Peberdy, 1997; Kemm & Close, 1995; Naidoo & Wills, 2000). Anaparti & Chintalapuri (2009) in their study suggested that self- awareness about inadequacies in interpersonal relationships and emotional inappropriateness, and training on self-regulation may enhance the scope for social interaction among IT/ Computer professionals. Moreover, entertainment such as parties, music, movies etc. may act like instant stress busters and facilitate healthy congenial interpersonal relations. .

SKILLING MULTISECTOR WORKFORCES

In order to develop and implement evidence-based mental health promotion practice, a skilled intersectoral workforce is required. To facilitate this process, practitioners require training and tools to assist the conceptual development and planning, implementation and evaluation of project and programme activity. Efforts in this regard are emerging in a number of countries; however, a challenge lies in ensuring that these efforts are coordinated and that the training and tools developed have relevance for workers in both developed and developing countries.

MENTAL HEALTH HAS SPECIFIC VALUE IN ITSELF, IS INTEGRAL TO HEALTH AND IS THE FOUNDATION FOR WELL-BEING AND EFFECTIVE FUNCTIONING FOR INDIVIDUALS AND POPULATIONS

Promoting mental health is justified in itself as well as through its efficacy in helping to achieve other objectives such as increased productivity. While these benefits are important and may be decisive in terms of resource allocation, the promotion of mental health is fundamentally linked to human rights and equity

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as well as overall humanitarian and utilitarian values. **Promoting mental health needs to be undertaken with community participation.** This not only ensures that the interventions are appropriate but also enhances sustainability. **Intersectoral collaboration is the key to effective programmes for mental health promotion.** For some collaborative programmes better mental health is the primary objective. For the majority, however, mental health, even though valuable in its own right, is secondary to other social and economic outcomes.

WHAT CAN WE DO NOW?

The opportunity to take mental health promotion forward is unprecedented. However, amongst the various programmes and interventions listed by WHO (2005) for enhancing mental health, one specifically focus on workplace settings as "mental health interventions at work (e.g. stress prevention programmes)". In this context, countries need to adopt a public health framework as used to advance other areas of health, and thereby engage all relevant sectors to support and evaluate activities designed to promote mental health.

In the light of the above discussion, the focus should be on:

1. Promotion of mental health can be achieved by effective public health and social interventions. Although more research and evaluation is required, sufficient evidence at varying levels is available to demonstrate the effectiveness of programmes and interventions for enhancing the mental health of populations. Interventions that have been shown to be effective (see p. 285-286) should be implemented where required and evaluated in a culturally appropriate way.
2. Intersectoral collaboration should be fostered as it is the key to effective programmes for mental health promotion. For some collaborative programmes mental health outcomes are the primary objective. For the majority, however, these may be secondary to other social and economic outcomes but are valuable in their own right.
3. Sustainability of programmes is crucial to their effectiveness. Involvement of all stakeholders, ownership by the community and continued availability of resources need to be encouraged to facilitate sustainability of mental health promotion programmes.
4. More research and systematic evaluation of programmes is needed to increase the evidence base as well as to determine the applicability of this evidence in widely varying cultures and resource settings.
5. International action is necessary for generating and disseminating further evidence, for assisting low and middle income countries in implementing effective programmes (and not implementing those that are ineffective), and for fostering international collaboration.

CONCLUSION

There is an urgent need to develop mental health policies and to enhance promotion of mental health at different levels because of the great value of mental health in different contexts.

- Mental health, to which much confusion and many misconceptions are attached, is essential for the well-being and functioning of individuals.
- Good mental health is also an important resource for families, communities and nations.
- Mental health, as an indivisible part of general health, is often undervalued, although it contributes to the functions of society and has an effect on overall productivity.
- Mental health can be approached both from professional and lay perspectives. It concerns everyone as it is generated in our everyday lives in homes, schools, workplaces and in leisure activities.
- Positive mental health contributes to the social, human and economic capital of societies.

Without exaggeration, it is possible to say that mental health contributes to all aspects of human life. Mental health has both material or utilitarian and immaterial or intrinsic values. Material values are those that contribute to productivity and can, at least in principle, be measured in monetary terms. But one must not forget that mental health is also a great value in itself. So in this context, we must not ignore the fact that 'promoting mental health is a global health priority'. Intersectoral collaboration and partnerships are perhaps the key to effective mental health promotion. In nutshell, it calls for a shift in paradigm of health from 'treatment and prevention of mental illness' to 'promotion of mental health'.

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DOES COMPETATIVE ADVANTAGE WORK IN E.BUSINESS?

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ABSTRACT

A trend for businesses in the 21st century is to offer their products and services electronically, a practice known as electronic commerce, commonly referred to as "e-commerce". Major companies, such as Nike, Adidas, Future Shop, Sears, and other major retailers all offer their products online. Their mindset is that this offers quick, easy, and efficient service. There are advantages to engaging in e-commerce. First, providing fast and efficient service leads to a competitive advantage, and presents the opportunity to reach out to a larger target market. With the expansion of the Internet and a greater thirst for information and knowledge, global competition is becoming fierce, so gaining a competitive advantage is vital to the global and domestic strategy of a firm. In this regard the present work is an attempt to know how E.Business is helping to corporate customer to enjoy competative advantage.

KEYWORDS

Business, Commerce, Global, Competition, Internet.

INTRODUCTION

A trend for businesses in the 21st century is to offer their products and services electronically, a practice known as electronic commerce, commonly referred to as "e-commerce". Major companies, such as Nike, Adidas, Future Shop, Sears, and other major retailers all offer their products online. Their mindset is that this offers quick, easy, and efficient service. There are advantages to engaging in e-commerce. First, providing fast and efficient service leads to a competitive advantage, and presents the opportunity to reach out to a larger target market. With the expansion of the Internet and a greater thirst for information and knowledge, global competition is becoming fierce, so gaining a competitive advantage is vital to the global and domestic strategy of a firm. Considering the newness of the internet and World Wide Web, it's safe to say that nearly everyone who has purchased online gained their understanding of commerce *off*line. "Dirt-side" commerce transactions have structural, schematic, and semantic orders that don't fully map to the different medium of the web, and it's this gap in mapping that causes the problems users experience trying to shop online, whether the problems stem directly from usability flaws or unmet expectations.

Most people have an understanding of commerce based on their experience as shoppers and buyers, and they bring this experience with them when they start shopping online. Most problems with commerce sites are due to misunderstandings on the part of the site creators about how users understand the structure and elements of typical commerce transactions. Users have formed schemas to understand commerce, but commerce sites routinely ignore these schemas.

Commerce is a communicative transaction between two parties playing very familiar roles: *buyer* and *seller*. For commerce to occur, somebody must do the selling, and somebody must do the buying, and these two some bodies must share a basic understanding of how the transaction is generally supposed to flow. Ecommerce web sites can't simply make products available to be bought (*surface it, they will buy...*); these sites must hold up their part of role-playing the commerce transaction.

Ecommerce web sites must pay attention to how they communicate to users. Ecommerce sites play their role of seller by trying to broadcast two messages to potential buyers: **"buy from us"** and **"trust us"**. The impact of these explicit messages, though, is often corrupted by contradictory or distracting messages implicit in the site's implementation of navigation flow, page layout, visual continuity, and information space.

Ecommerce sites seem to shout the message that they are trustworthy, that users need have no trepidation over purchasing from these sites, but trust derives not from assertions but rather from experience and judgment. People interact, and they make judgments and form expectations of others based on what they experience and what they surmise; it's a lot easier to decide to trust a merchant when you can speak to them face-to-face and shake their hand. Trusting a web site to deal with you fairly and deliver your merchandise, though, well, that's harder to do when you realize that *anyone* can build a commerce site. Ecommerce sites must work hard to build the impression of trustworthiness.

HISTORICAL DEVELOPMENT

The meaning of the term "electronic commerce" has changed over time. Originally, "electronic commerce" meant the facilitation of commercial transactions electronically, usually using technology like Electronic Data Interchange (EDI, introduced in the late 1970s) to send commercial documents like purchase orders or invoices electronically.

Later it came to include activities more precisely termed "Web commerce" -- the purchase of goods and services over the World Wide Web via secure servers (note HTTPS, a special server protocol which encrypts confidential ordering data for customer protection) with e-shopping carts and with electronic pay services, like credit card payment authorizations.

When the Web first became well-known among the general public in 1994, many journalists and pundits forecast that e-commerce would soon become a major economic sector. However, it took about four years for security protocols (like HTTPS) to become sufficiently developed and widely deployed (during the browser wars of this period). Subsequently, between 1998 and 2000, a substantial number of businesses in the United States and Western Europe developed rudimentary Web sites.

Although a large number of "pure e-commerce" companies disappeared during the **dot-com** collapse in 2000 and 2001, many "brick-and-mortar" retailers recognized that such companies had identified valuable niche markets and began to add e-commerce capabilities to their Web sites.

As of 2005, e-commerce has become well-established in major cities across much of North America, Western Europe, and certain East Asian countries like South Korea. However, e-commerce is still emerging slowly in some industrialized countries, and is practically nonexistent in many Third World countries. Electronic commerce has unlimited potential for both developed and developing nations, offering lucrative profits in a highly unregulated environment.

Success factors in e-commerce
Technical and organizational aspects

In many cases, an e-commerce company will survive not only based on its product, but by having a well-organized business structure and a secure, well-designed website. Such factors include:

1. Providing an easy and secure way for customers to order. Credit cards are the most popular means of sending payments on the internet, accounting for 90% of online purchases.
2. Providing reliability and security. Parallel servers,fail-safetechnology, information encryption, and firewalls can enhance this requirement.
3. Providing a 360-degree view of the customer relationship, defined as ensuring that all employees, suppliers, and partners have a complete view, and the same view, of the customer.

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4. Constructing a commercially sound business model. If this key success factor had appeared in textbooks in 2000, many of the dot-coms might not have gone into bankruptcy.
5. Engineering an electronic value chain in which one focuses on a "limited" number of core competencies -- the opposite of a one-stop shop.
6. Operating on or near the cutting edge of technology and staying there as technology changes (but remembering that the fundamentals of commerce remain indifferent to technology).
7. Setting up an organization of sufficient alertness and agility to respond quickly to any changes in the economic, social and physical environment.
8. Providing an attractive website. The tasteful use of colour, graphics, animation, photographs, fonts, and white-space percentage may aid success in this respect.
9. Streamlining business processes, possibly through re-engineering and information technologies.

BUSINESS TO BUSINESS E-COMMERCE

Business to Business E-commerce is defined as buing and selling between two companies over the internet. The companies might be manufacturers, wholselers, or retailers. B2B e-commerce sales are expetected to approch $ 1 trillion in Europe alone by the end of 2006.

ELECTONIC DATA INTERCHANGE (EDI)

EDI is an electronic computer-to-computer transfer of standard business documents. Companies have been doing EDI since the 1960s and orginally used telephone lines to transfer data.Companies can set up their own private EDI networks to communicate directly with their suppliers' systems. Some companeis with nonintegrated information systems have built web services before creating an integrated back-office system. As a result, those companies often can't fill orders in a timely fashion. Hence e-commerce with ERP definitely offers Comperirive advantage.

RETIALING IN E-BUSINESS

The word "Retail" is derived from the French word "retailier" meaning 'to cut a piece of' or to 'to break bulk'. Retailing includes all the activities involved in selling goods and services directly to final consumers for their personal, non-business use. The retailing scenario in india is unique. Much of it is in the unorganized sector, with over 12 million retail outlets of various sizes and formats. With more than 9 outlets per 1000 people, india has the largest number in the world.

In a developing country like India, a large chunk of consumer expenditure is on basic necessities, especially food related items. The share of retail sector was about 71% in 2002 and it is grwoing rapidly and being accounted for nearly 85% in total of all items of the Indian markets. The E-Business models includes B2B, B2C and C2C modles. The B2B transactions provide customers the benefits like:

• Efficient management of inventory
• Quick response to customer demand
• Reduction in the cost of paperwork
• Efficient and fast product launch
• Control over fraudulent purchases etc.
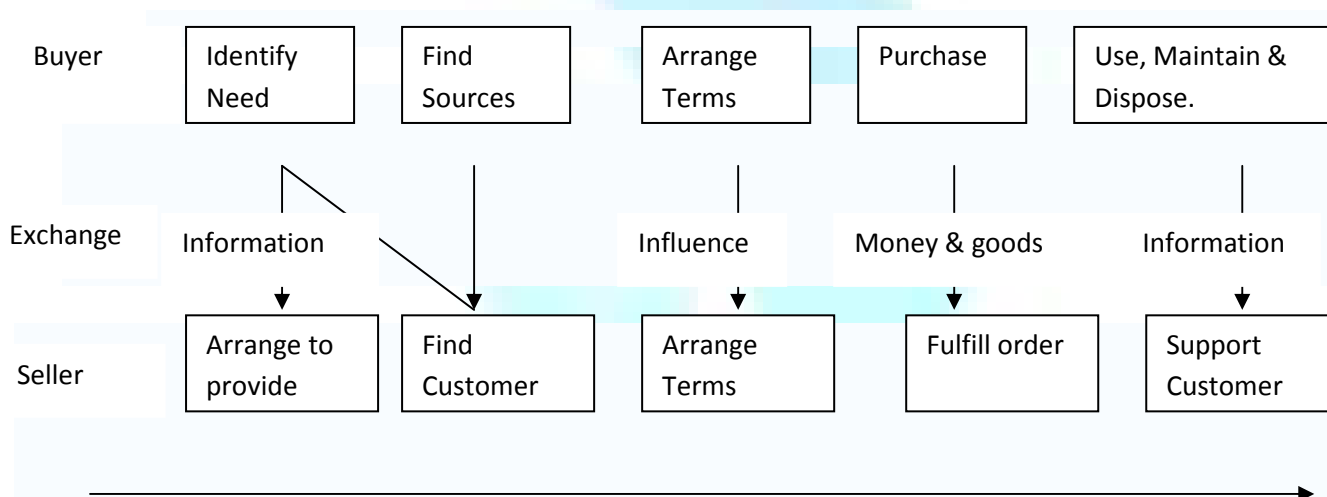
Process Flow

1. **Lucrative Market**
    ➢ One can have access to a growing global market.
    ➢ Consumers are generally affluent and technically literate.
    ➢ Electronic shopping will be widely used by the next generation.
2. **Dynamic Delivery**
    ➢ Electronic vehicle permits instant information delivery and business responses in a customer's chosen environment.
    ➢ Captured statistices enables profiling of shopper demographics, preferences, and activity within the site, to develop more effective merchandising strategies.
    ➢ Programmability enables dynamic market targeting personalize the shopping experience and to tailor product line presentation to viewer preferences.
    ➢ Inforamtion is always complete and up-to-date.
    ➢ Merchants can be the product line to seasonal and market requirments, without moving merchandise.
3. **Preferred Environment**
    ➢ Provides shoppers with a private location, efficiency, accessibility, and fun. The dynamic nature of the site also invites shoppers to return often.
4. **Economical**
    ➢ Low cost for start up as compared to opening a physical site.
    ➢ Boundary-fee, since a single site can be reached by the world market.
    ➢ Low requirments of support staff reduce personnel costs.

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CUSTOMER-ORIENTE

A successful e-commerce organization must also provide an enjoyable and rewarding experience to its customers. Many factors go into making this possible. Such factors include:

1. Providing value to customers. Vendors can achieve this by offering a product or product-line that attracts potential customers at a competitive price, as in non-electronic commerce.
2. Providing service and performance. Offering a responsive, user-friendly purchasing experience, just like a flesh-and-blood retailer, may go some way to achieving these goals.
3. Providing an incentive for customers to buy and to return. Sales promotions to this end can involve coupons, special offers, and discounts. Cross-linked websites and advertising affiliate programs can also help.
4. Providing personal attention. Personalized web sites, purchase suggestions, and personalized special offers may go some of the way to substituting for the face-to-face human interaction found at a traditional point of sale.
5. Providing a sense of community. Chat rooms, discussion boards, soliciting customer input and loyalty programs (sometimes called affinity programs) can help in this respect.
6. Owning the customer's total experience. E-tailers foster this by treating any contacts with a customer as part of a total experience, an experience that becomes synonymous with the brand.
7. Letting customers help themselves. Provision of a self-serve site, easy to use without assistance, can help in this respect.

Problems

Even if a provider of E-commerce goods and services rigorously follows these "key factors" to devise an exemplary e-commerce strategy, problems can still arise. Sources of such problems include:

1. Failure to understand customers, why they buy and how they buy. Even a product with a sound value proposition can fail if producers and retailers do not understand customer habits, expectations, and motivations. E-commerce could potentially mitigate this potential problem with proactive and focused marketing research, just as traditional retailers may do.
2. Failure to consider the competitive situation. One may have the capability to construct a viable book e-tailing business model, but lack the will to compete with Amazon.com.
3. Inability to predict environmental reaction. What will competitors do? Will they introduce competitive brands or competitive web sites? Will they supplement their service offerings? Will they try to sabotage a competitor's site? Will price wars break out? What will the government do? Research into competitors, industries and markets may mitigate some consequences here, just as in non-electronic commerce.
4. Over-estimation of resource competence. Can staff, hardware, software, and processes handle the proposed strategy? Have e-tailers failed to develop employee and management skills? These issues may call for thorough resource planning and employee training.
5. Failure to coordinate. If existing reporting and control relationships do not suffice, one can move towards a flat, accountable, and flexible organizational structure, which may or may not aid coordination.
6. Failure to obtain senior management commitment. This often results in a failure to gain sufficient corporate resources to accomplish a task. It may help to get top management involved right from the start.
7. Failure to obtain employee commitment. If planners do not explain their strategy well to employees, or fail to give employees the whole picture, then training and setting up incentives for workers to embrace the strategy may assist.
8. Under-estimation of time requirements. Setting up an e-commerce venture can take considerable time and money, and failure to understand the timing and sequencing of tasks can lead to significant cost overruns. Basic project planning, critical path, critical chain, or PERT analysis may mitigate such failings. Profitability may have to wait for the achievement of market share.
9. Failure to follow a plan. Poor follow-through after the initial planning, and insufficient tracking of progress against a plan can result in problems. One may mitigate such problems with standard tools: benchmarking, milestones, variance tracking, and penalties and rewards for variances.

Product suitability

Certain products/services appear more suitable for online sales; others remain more suitable for offline sales.Many successful purely virtual companies deal with digital products, including information storage, retrieval, and modification, music, movies, office supplies, education, communication, software, photography, and financial transactions. Examples of this type of company include: Google, eBay and Paypal.

Virtual marketers can sell some non-digital products and services successfully. Such products generally have a high value-to-weight ratio, they may involve embarrassing purchases, they may typically go to people in remote locations, and they may have shut-ins as their typical purchasers. Items which can fit through a standard letterbox - such as music CDs, DVDs and books - are particularly suitable for a virtual marketer, and indeed **Amazon.com,** one of the few enduring **dot-com** companies, has historically concentrated on this field.

Products such as spare parts, both for consumer items like washing machines and for industrial equipment like centrifugal pumps, also seem good candidates for selling online. Retailers often need to order spare parts specially, since they typically do not stock them at consumer outlets -- in such cases, e-commerce solutions in spares do not compete with retail stores, only with other ordering systems. A factor for success in this niche can consist of providing customers with exact, reliable information about which part number their particular version of a product needs, for example by providing parts lists keyed by serial number.

Purchases of pornography and of other sex-related products and services fulfil the requirements of both virtuality (or if non-virtual, generally high-value) and potential embarrassment; unsurprisingly, provision of such services has become the most profitable segment of e-commerce.

Products unsuitable for e-commerce include products that have a low value-to-weight ratio, products that have a smell, taste, or touch component, products that need trial fittings - most notably clothing - and products where colour integrity appears important.

ACCEPTANCE

Consumers have accepted the e-commerce business model less readily than its proponents originally expected. Even in product categories suitable for e-commerce, electronic shopping has developed only slowly. Several reasons might account for the slow uptake, including:

- Concerns about security. Many people will not use credit cards over the Internet due to concerns about theft and credit card fraud.
- Lack of instant gratification with most e-purchases (non-digital purchases). Much of a consumer's reward for purchasing a product lies in the instant gratification of using and displaying that product. This reward does not exist when one's purchase does not arrive for days or weeks.
- The problem of access to web commerce, particularly for poor households and for developing countries. Low penetration rates of Internet access in some sectors greatly reduces the potential for e-commerce.
- The social aspect of shopping. Some people enjoy talking to sales staff, to other shoppers, or to their cohorts: this social reward side of retail therapy does not exist to the same extent in online shopping.

There are three steps to analyze when looking at the creation of an online business: **Consideration**, **Implementation**, and **Finalization.**

CONSIDERATION

How does a business know whether they should engage in such a practice? Despite the obvious advantages to e-commerce, it does not always meet the long term needs of a company. If the market for the product is quite small, then there is no need to engage in e-commerce as it will be less difficult to gain competitive advantage and would only result in unnecessary costs and expenses. Secondly, if the company wishes to remain domestic and not expand its services, then a company would be better suited to follow the normal processes of adversiting than participating in e-commerce. Finally, a company must

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consider whether the business would even succeed or thrive in the e-commerce environment. For example, selling food online would not be a viable venture, as the ultimate costs (wastage, storage, transportation) would outweigh the benefits.

However, if a company believes that their product has great market potential outside of their domestic realm, and feel that they can participate in e-commerce, then some time must be taken to lay down the floor plan for the business. Some aspects to consider are:

- What is the idea for the business?
- Is it a product or service?
- What is the name of it?
- Will you emphasise price, quality, service, or another point?
- What is the target market?

IMPLEMENTATION

The key to successfully starting and creating an online business is choosing the right Web host. Try to find one that offers guarantees, is flexible, responds to your concerns, and quite simply is one that offers the services that you want and need. Once you have found the right Web host for you and created an account, the next step is start building your site. This is going to be the bread and butter of your business. Having an attractive yet simple site will have a great impact. Ensure that it projects the right image and is directed to the right target market for your product. It should be easy to navigate and have a solid search option. Also clarify what sorts of policies you will implement, such as return policies, acceptance or rejection of credit cards, check-out, and any other payment options such as cheques or money orders. Finding the right merchant account to help you accept credit cards is important.

If you are selling products, there are many types of software out there to help you create an effective and efficient ordering system. Look at the features that you will need for your site and compare them to the software that is available. Some may be expensive and others will be free.

FINALIZATION

Now that you have created the website and are ready to begin, the next important step is to market your online business. The options are numerous and can include:

- Join a search engine and pay a fee for placement
- Contract with affiliate sites and programs
- Advertise
- Virally market
- Use promotions

A key step is developing some sort of PR strategy. Your customers are the most important aspect of your business. Make them happy. This can include offering links on your site to answer Frequently Asked Questions (FAQs), shipping quickly, designing a system for easy returns, as well as any other type of cusomter service.

It is also important to constantly change and maintain the freshness of your site. This includes altering colors and creating new displays. Another noteworthy option is to include some sort of statistical counter so that you find out where your customers are logging in from and what they do on your site. Test any advertisements that you create to see how effective they are. ECommerce works as follows.

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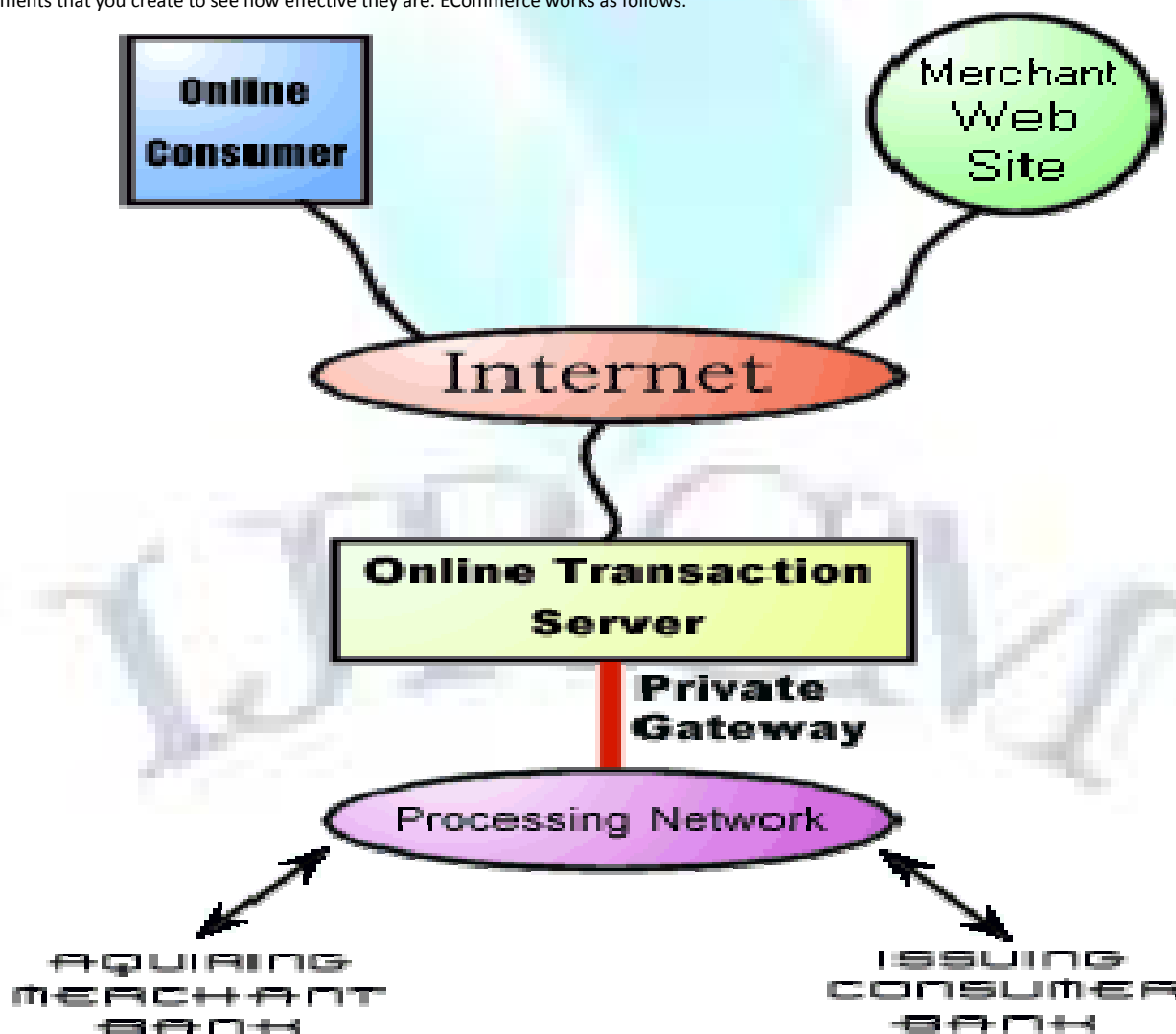
The consumer moves through the internet to the merchant's web site. From there, he decides that he wants to purchase something, so he is moved to the online transaction server, where all of the information he gives is encrypted. Once he has placed his order, the information moves through a private gateway to a Processing Network, where the issuing and acquiring banks complete the transaction. This generally takes place in no morethan5-7seconds. There are many different payment systems available to accommodate the varied processing needs of merchants, from those who have a few orders a day to those who process thousands of transactions daily. With the addition of Secure Socket Layer technology, eCommerce is also a very safe way to complete transactions.

CONCLUSION

Online commerce is still new enough that participants are still trying to get a handle on how the rules of commercial interaction apply to this new medium. The burden of smoothing the transition to online commerce falls to the creators and owners of ecommerce sites, because when a commercial transaction falters through misunderstanding or distrust, a typical buyer-to-be won't spend any effort analyzing the contradictory message cues or violated role-playing expectations. When a potential customer is frustrated, s/he will exit; the merchant has the investment in fostering the relationship, and so had better understand the mechanics of the relationship, starting with the roles.

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E-GOVERNANCE AS A CONTRIBUTION TO CITIZENS' IDENTITY - A DISTRICT LEVEL STUDY OF PUNE MUNICIPAL CORPORATION

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ABSTRACT

Citizens are the epic center of government. Citizens as consumers of public goods and services see efficient system in business world, tending them to expect the same from the government departments too. With the newfound ability to do business online, the public has come to expect a much greater level of convenience, availability and reliability of government products and services. E-governance through the concept of Citizen Relationship Management forwards a solution to meet this end. The bottleneck appears, in implementing this IT-enabled concept, in the form of multiplicity in citizens' identity system as this paper points out based on a study of Pune district in the State of Maharashtra. This paper suggests that an understanding of e-Governance in city such as Pune where e-governance application in information and communication technologies to transform the efficiency, effectiveness, transparency and accountability of informational & transactional exchanges within government, between govt. & govt. agencies of National, State, Municipal & Local levels, citizen & businesses, and to empower citizens through access and use of information. E-Governance is a wider concept that defines and assesses the impact technologies are having on the practice and administration of governments and the relationships between public servants and the wider society. E-Government lets citizen's access government information and services and gives them the opportunity to participate in democratic institutions and processes. E-Government provides higher quality, cost-effective, government services and a better relationship between people and their government.

KEYWORDS
E-governance,CitizenRelationshipManagement,ICT(Information,Communication,Technology), Citizen Empowerment.

E-GOVERNMENT IN MAHARASHTRA
The Government of Maharashtra (GOM) is keen to accelerate the process of computerization and the pace and process of e-Governance. The mission statement of our Information Technology policy is 'Empowerment through Connectivity'. The objective of the state policy is to give to the citizens 'anywhere, anytime, anyhow services.

The state is determined to harness information technology to create a knowledge-based society that empowers citizens to participate in the development of the state and provides efficient and speedy services to its citizens and businesses.

The Government of Maharashtra is in process of computerizing the working of all its departments and administrative units and provide universal access to information, while keeping administrative costs low.

Their aim is to make the State a 'Maha-IT-rashtra' by using state-of-the-art information technology-such as wireless technology and handheld portable devices-to reach the remotest areas and poorest people and improve the standard of living statewide.

E-GOVERNMENT: SCOPE
E-Government is about a process of reform in the way Government works, shares information and delivers services clients so as to benefit both government and the citizens and businesses that they serve.

E-Government harnesses information technologies which include Wide Area Networks (WAN), Internet, World Wide Web, and mobile computing by government agencies to reach out to citizens, business, and other arms of the government to:

Improve service delivery to citizens;

Improve interface within business and industry;

Empower citizens giving access to knowledge and information; and

Make the working of the government more efficient and effective

The resulting benefits could be higher degree of transparency, greater convenience to citizens, growth in state revenues, cost reduction and less corruption for better environment.

Different Models of Delivery

- Departments going on-line
- Greater departmental ownership: possibility of significant re-engineering
- Citizen visit many departments, each one may be more efficient
- Could be a step ahead in the absence of high band width network
- Convenient location of Service Centers
- Counters by public/private agencies
- Multiple services at each location: payment, licenses, certificates
- Can quickly move traffic from departments to service centers

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- Requires coordination
- Self Service through a Portal one stop shop
- Back end computerization and integration for data sharing
- High internet penetration, willingness and ability of citizen to use
- Security and mutual trust.
- Requires strong centralized leadership for extensive co-ordination

GOVERNANCE FOR THE TWENTY-FIRST CENTURY IN PUNE

The city of Pune is located in the Indian state of Maharashtra, approximately 200 kilometres east and 400 kilometres southeast of Mumbai, respectively. Pune is a major city and industrial centre with a population of 3,516,304. Pune is India's seventh largest city and benefits economically from its location close to Mumbai .Pune city suffer from adequate infrastructure, which has not kept up with the rapid pace of urban growth. The provision of basic infrastructure across the city of Pune, infrastructure is often old and poorly maintained. 1991 was a key turning point, as a result of the liberalization of the Indian economy.This situation had a direct impact on urban management, especially in regard to the demand for large-scale infrastructure development and promotion of a corporate-led economy. A significant development here was the coming up of large financing institutions to support this that drew on national funds and funds from international bilateral and multilateral agencies. Financing institutions moved from their traditional role of funding projects to funding large scale infrastructure programmes as financial intermediaries.

Access to relatively cheap and state government-secured funds has in turn generated new demand. The concept of the information technology sector for modernization has captured the imagination of Pune's political and bureaucratic elite. The main justification is to make Pune "globally competitive". Corporate information technology groups were quick to point out the deficiencies in infrastructure in Pune and to demand ever more dedicated investment by the state to promote growth.

e-GOVERNANCE AT PUNE MUNICIPAL CORPORATION

PMC believes that e-Governance is an opportunity to transform the corporation's commitment to be citizen centric, provide cost-effective service and enhance governance through improved access to accurate information .Thus e-Governance is a permanent part of the governing process. For both government organizations and citizens, its advantages are far reaching in comparison to investment in establishing e-governance.

Pune Municipal Corporation (PMC) is one of the largest and leading Urban Local Governance Body in Maharashtra. It is committed to provide transparent, accountable and efficient local governance through the use of modern technology especially in management and administration fields. It has decided to embrace Information Technology in the form of e-Governance tool to achieve the goals.

PMC covers an area of over about 237 Square Kilometres, catering to the civic needs of over 25 lakh citizens. Most of the functions carried Pune Municipal Corporation are service oriented, and have been already computerized to larger extent. There are 144 wards and 42 Citizen Facilitation Centres (CFC's) in Pune through which various services are rendered to the citizens. Better IT systems are required to integrate the workflow for a faster and efficient service to the citizens, employees, administrators.

Pune Municipal Corporation (PMC) has always been on the forefront of ICT enablement of services and departments to render faster and efficient services to the citizens. PMC is truly on its way to become complete e-Governed Urban Local Body in the country. Some of the unique initiatives taken by PMC are -

- **Registration of Births and Deaths:**   Birth and Death registration is already computerized. Online registration facility is available and computerized certificates are being issued to citizens.
- **Public Grievance Redressal:** As part of interactive web portal of PMC grievance readdressal system already in place.
- **Property Tax Management:** Property tax database is computerized and demand notes are issued by this database. Property tax dues are updated regularly online. Property tax payments and collection is also facilitated by ICICI Infinity Internet gateway.
- **Municipal Accounting System:** The present Cash based Double Entry accounting system is already computerized. That system is proposed to be converted to computerized Double Entry Accrual System on an ERP platform and the process for the same is already
initiated.
- **E-Procurement:** Interactive website for information on tenders of departments is in place.
- **Personal Management:** Payroll and Pension System is already commissioned this includes Biometric Time & Attendance System .The system is currently being integrated with the payroll system. Payment of Property Tax, Utility Bills and Management of Utilities that come under the ULBs Online windows for payment of Property Tax and Water Bills have been initiated from the Head Qtrs., zonal offices and Citizen Facilitation Centers of the PMC.
- **Building Plan Approval:** Building plan permission process is automated and made available online on the interactive website of PMC.
- **Unwire Pune**: PMC is one of the first governance bodies in the country to launch a project for providing Wi-Fi connectivity across the city. Through this initiative "Unwire Pune", Pune Municipal Corporation (PMC) propose to deliver a solution to the citizens, businesses and academic institutions to connect to the internet in a relatively easy manner. As much as providing basic facilities such as drinking water supply, sewerage, power, roads etc, PMC would like to provide basic Information Technology infrastructure such as stable internet connectivity to its citizens and also offer compelling business and cost models to attract and sustain major ISP businesses in Pune.

Looking at the challenges faced due to rapid growth of Pune district, there is increasing need to have a comprehensive, integrated, ERP based e-Governance model. Such a system will help administration to adhere to the reform agenda set by PMC. The reform agenda are given below:

1. **Promote citizen centric administration:** Common citizens should get the benefits of the system of accurate billing. Corruption should be avoided.
2. **Move from process accountability to productivity accountability and from transactional to transformative governance**: The process is computerized to increase productivity. Every department of the corporation has reports giving exact statistics of how accountability is achieved through the system.
3. **Reduce delays and ensure promptness in service delivery:** Computerization would ensure timely delivery of accurate services.

E-ADMINISTRATION

Improve administrative processes by cost cutting, managing performance, making strategic linkages with the local bodies and creating empowerment E-Citizen and E-Services: Connect citizens to the local government by talking to citizens and supporting accountability, by listening to citizens and supporting democracy by improving public services.

The e-administration of government is to restore trust in government by providing strong social services:

1. To increase collaboration among government organizations.
2. To strengthen the relationship between people and state through greater opportunities for participation.
3. To provide the state with an opportunity to improve the effectiveness and efficiency of public services while reducing their cost.

The e-Government administration is about inclusion-helping people take part in economic growth. It fits well with similar development in business and commerce. Together, e-Government, e-business and e-commerce will play an important role in the development of an economy that mobilizes the knowledge and skills of all citizens.

E-GOVERNANCE - EMPOWERING PEOPLE THROUGH SERVICE DELIVERY

E-Government will be an example of an innovative use of developing technologies and help citizens to understand and use the tools of the information economy; this is a matter of vital importance to the economic and social prosperity of individuals and country. It is recognized that both the e-government and

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e-governance need enablers for success. Broadly they are, Educational levels, Cultural readiness, Income levels, Confidence and trust in Government, Customer readiness, Privacy and data protection, Use of Customer Data by Government, Freedom of Information, Electronic commerce, Copyright regulations, Telecommunications and Cross agency operations. Government is an institutional superstructure that society uses to translate politics into policies and legislation. Governance is the outcome of interaction of government, the public service, and citizens throughout the political process, policy development, program design, and delivery of service. The institution of government involves a narrower range of considerations than the wider functions of governance. Governments are specialized institutions that contribute to governance.

Governments are bureaucratically organized and constitutionally legitimated. Governments serve as both the highest forum for policy making within their jurisdictions, and as the final court of appeal within their jurisdictions for dissenters to those policies. Mostly work of government consists of actually implementing policies through service delivering programs. Governments often face the need to rationalize discrepancies among the people desires to achieve their own ends. Governance is distinct from government as it concerns longer-term processes rather than immediate decisions. Governance is a set of continuous processes that usually evolve slowly with use unlike government. The governance focuses on processes rather then decisions. Governance takes the view of social objectives; it involves the coordination of efforts rather than the implementation of specific programs. This is the systemic perspective as opposed to a focus on the individual practice, or player, or process. The "bottom line" for governance is outcomes rather than the outputs of government.

There are a multitude of situations that require government decisions, and a variety of types of decisions that governments render. Decisions that are confined to a particular policy, program, department, region, or group, are usually easier to frame, negotiate, and finalise. Unfortunately the unexpected can occur, when a previously insignificant occurrence suddenly acquires disproportionate importance "out of the blue", often because of a change in its political salience. Even for these situations there are now coping skills. Joint decisions that need to be agreed between various levels of jurisdiction can also be particularly tricky to arrive at. Governments may lack the money, personnel, or expertise to implement decision they desire, or they may face constitutional limits regarding what they can impose without the consent of the governed. These kinds of government decisions are becoming the fastest-growing type in today's policy environment. Some experts contend that many knowledge workers within governments are resistant to assignments to manage processes rather than to deal with "substantive issues". But since government is not a single-issue or a single-instance exercise, on-going processes are what governance is all about. If governing processes were directed by flexible guidelines and if those on the front line were permitted to respond to unforeseeable particulars in a creative way, the larger aim of policy and program improvement may be favorably achieved. The Engagement Process consists of citizens and interest groups interacting with government representatives. The Consultation Process involves direct contact between the public service, citizens and interest groups. In the case of interest groups, they have sought and gained access to bureaucrats for decades. What is changing is that individual citizens and community groups are now beginning to obtain similar access even if in limited numbers at this point in time. This process empowers citizens to actually shape regulations.

CONCLUDING REMARKS

Pune Municipal Corporation (PMC) has always been on the forefront of ICT enablement of services and departments to render faster and efficient services to empower the citizens. PMC is truly on its way to become complete e-Governed Urban Local Body in the country. Issues of accountability, transparency and responsiveness depend on the character and nature of prevailing institutions. The standardization, is one of the major issues that is evolving and needs to be addressed urgently. There is need for an in-depth discussion so as to evolve the next generation government.

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DETERMINANTS OF MIGRATION IN PUNJAB, INDIA: A CASE STUDY OF AMRITSAR DISTRICT

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ABSTRACT

Internal migration refers to a move from one area to another within a country. Rural to Urban migration is a consequence of wide economic opportunities in the urban areas. Historically, it has played a significant role in the urbanization of several countries and continues to be significant in scale, even though migration rates have slowed down in some countries. This paper is an attempt to understand underlying factors for rural-to-urban migration in district Amritsar, Punjab, India. According to Census 2011, population of Amritsar is 2,490,891 with decadal growth rate of 15.48 percent. Literacy rate of the district is 77.2 percent. The study focuses on application of push and pulls factors to understand rural to urban migration. Forces that push people to move out of their place of residence are known as push factors and forces that attracts particular group to settle are called as pull factor. The study concludes that, migration occurs at a prime productive age and the leading push factors are 'low paying jobs' and 'poor economic opportunities' as the two main reasons. The other prominent factors were found to be economic insecurity and poor educational facilities. Consistent in line with the push factors, better economic opportunities, good education facilities, availability of health facilities were the top three pull factors. Good transportation facility along with sanitation facilities (35%) and Information Communication Technological facilities were other main pull factors.

KEYWORDS
Migration, Push, Pull, Urbanization.

INTRODUCTION

Migration is the crossing of the boundary of a political or administrative unit for a certain minimum period of time. Internal migration refers to a move from one area (a province, district or municipality) to another within a country. International migration is a territorial relocation of people between nation-states. The dominant forms of migration can be distinguished according to the motives (economic, family reunion, refugees) or legal status (irregular migration, controlled emigration/immigration, free emigration/immigration) of those concerned. The different type of migrants / migration includes temporary labour migrants, highly skilled and business migrants, irregular migrants, forced migration, family members, return migrants. Migration is an important factor in the erosion of traditional boundaries between languages, cultures, ethnic group, and nation-states. Even those who do not migrate are affected by movements of people in or out of their communities, and by the resulting changes[6]. Migration is a phenomenon observed all over the world and India, one of the fastest growing countries in the world with rapid economic growth. Indian urban population rose from a small figure of 25.6 million in 1901 to 309 million in 2001 that is thirty percent of the total population. Percent decadal growth of population in rural and urban areas in the decade ending 2001 was 17.9 and 31.2 percent in the urban population of the country during the preceding decade (Census of India, 2001).

Census of India 2001 reveals that during the last decade (1991-2001), the number of migrants in India (excluding J&K) rose by 32.9%, the total number of migrants by place of last residence in India (excluding J&K) grew by 34.7% during 1991-2001. It also states that high growth (53.6%) among interstate migrants was also observed and the total migrants by last residence (0-9 years) accounted to 98.3 million. A cursory look at the reason for migrations presents that 43.8% moved due to marriage, 21.0% moved with their households, 14.7% migrated due to work, 6.7% moved after their birth, 3% for educational purposes, 1.2% for business and 9.7% specified other reasons. It further states that rural to urban migration was 20.5 million. The table given below reveals statistics of intra-state migrants in India.

TABLE 1: INTRA-STATE MIGRANTS IN INDIA (CENSUS, 2001)

Intra-state Migrants in India	Persons (in %)	Male (in %)	Female (in %)
Rural to Rural	60.5	41.6	68.6
Rural to Urban	17.6	27.1	13.6
Urban to Rural	6.5	8.6	5.6
Urban to Urban	12.3	18.3	9.7
Unclassified	3.1	4.4	2.6

Source: http://www.iomindia.in/migration_in_india.html

Rural to Urban migration is a consequence of wide economic opportunities in the urban areas. Historically, it has played a significant role in the urbanization process of several countries and continues to be significant in scale, even though migration rates have slowed down in some countries (Lall, Selod and Shalizi, 2006). This paper is an attempt to understand the rural-to-urban migration flows at the district level and find out the various reasons of immigration for rural to urban area.

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[6]http://www.unesco.org/new/en/social-and-human-sciences/themes/social-transformations/international-migration/glossary/migrant/

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The district of Amritsar was selected as it is currently witnessing rapid urban growth. According to Census 2011, population of Amritsar is 2,490,891 with decadal growth rate of 15.48 percent. Literacy rate of the district is 77.2 percent[7]. Government of India and Government of Punjab have unveiled a Rs. 3,150 Crore plan to modernize Amritsar. Money from the plan would fund construction of roads, water and sewage management, and a mass Rapid transit system. Amritsar has witnessed a spurt in high-end residential property and multiplex development, courtesy the government's decision to set up a special economic zone there. Leading property developers from north India have lined up a series of townships containing villas, luxury apartments, service apartments, and penthouses. About a dozen malls are also in various phases of completion. Amritsar also acts as an education hub for the region. There are many educational institutions ranging from engineering to arts. Also many institutes such as Institute of Banking Services (IBS) cater to the city as well as surrounding areas. New localities are coming up in and around the town developed by private developers and developments by government agencies like Punjab Urban Dvelopment Authority-PUDA and Amritsar Development Authority (ADA)[8]. All these opportunities provide a perfect ground for attracting rural to urban migration in the district.

The study focuses on application of push and pulls factors in the current study. Forces that push people to move out of their place of residence are known as push factors and forces that attracts particular group to settle are called as pull factor (Gurusharan Singh Kainth, 2009). Study of migration is necessary for understanding the population dynamics as it's the most volatile component sensitive to political, social and economic factors (Singh, 1998). The study becomes more relevant in the context of comments of Director General of IOM, Brunson McKinley who said that "Migration will be one of the major policy concerns of the twenty-first century. In our shrinking world, more and more people will look to migration – temporary or permanent – as a path to employment, education, freedom or other opportunities. Governments will need to develop sound migration policies and practices. Properly managed migration can contribute to prosperity, development and mutual understanding among people"[9].

EVIDENCE FROM LITERATURE

The evidence from literature is presented in the order of studies undertaken at international level pertaining to migration. Thereafter, some Indian studies are being discussed with special focus on rural to urban migration.

Many studies of migration have been trying to explore the principle of migration and the earliest study on this was published by Ravenstein, *"The Law of Migration"* in 1885 (Greenwood & Hunt, 2003). In a study, the author argues that "rural population is more migratory than urban population" resulting into the development of law: "the process of dispersion is inverse to that of absorption" (Ravenstein, 1885). According to economic theory of migration, the geographic difference in the demand and supply of labor is the major causal factor for rural to urban migration (Lewis, 1954). Similarly, Harris and Todaro model in 1970, has established the fact that improved wages and better economic opportunities are the driving force for rural migrants, however Willimson in 1988, extending the former model, argued the presence of other elements like social, political, geographical, etc as well, that determines the choice of migration. Whereas, Haan and Rogely 2002 emphasized that migration is not always the result of crisis, it can also be livelihood strategy during economic, political, social and physical adversity. Thus, a multidisciplinary approach has been explored to learn the trend of migration (Oberai & Bilsborrow, 1984). Migration been the third component of population change, determined by the requirements of the migrant, defines the dynamic of the society and participates in decision making of any population based policy (R.B Bhagat, 2005, Gurusharan Singh Kainth-2009). Bilsborrow (1998) has distinguished various types of migration and migrant that involves long-term migration, permanent migration, seasonal migration, temporary migration, circular migration etc which could be internal or international. International migration has been greatly debated upon globally, but internal migration has far greater significance due to the involvement of large population displacement affecting the dynamics of society (Priya Deshingkar, 2004). Internal migration means movement within the boundaries of nation (Dang, 2005) and the magnitude of the internal movement depends on the likelihood of lower risk and lesser cost of moving and enhanced rate of migrants returning (Banerjee and Kanbur, 1981).

In India, internal migration has not gained priority in Indian researcher's point of view (Bhagat, 2009). But studies are undertaken to learn the paradigm change in the cause of migration. In early seventies, political influence was a major causal agent of migration, which along with time has changed in the last three decades. In 2000, the economic reason has become the major underlying factor of any movement though, social, religious, political and geographical determinants also plays impetus role in the process now (R.B. Bhagat, 2006, Sven Grim, 2004, Gurusharn Singh Kainth, 2009). Time and again migration of Bangladeshi refugees in India is among the best example of political and religious factors forcing to migration (Pranati Datta, 2004). But migration not necessarily has to be forceful it can be voluntary as well (Priya Deshingkar, 2009). These factor either forces or motivators, are categorized into two broad categories -pull factors or push factors for the migrants. Push factors for Indian's internal migration had been poor productivity, unemployment, wage variances, castiesm, communal differences, decreasing land-man ratio, natural calamities etc. Whereas, pull factors are like better economic opportunities, better connectivity, improved standard of living, better amenities, etc (Gursharan Singh Kainth, 2009, Priya Deshingkar, 2007).

In India, internal migration is the dominant source of migration, which involves rural to urban intrastate mobility as well. Around 98 million people were mobile during the decade 1991-2001. Out of which, female (65 million) found to be more migrant than male (33 million) and around 83% were intrastate migrants showing enhanced rate of mobility among Indian population (Census, 2001 and NSSO, 2001). The reasons for female migration had predominantly been marriage whereas for male had been search of employment (R.B Bhagat, 2005). It's been found that poverty and migration are interrelated, as poverty may cause migration (as seen from rural to urban) or vice versa (as seen in cities) (Deshingkar & Akter, 2007). India has the largest population of poor in the world i.e. 38 million. Poverty level is not uniform across India as a result 75% of poor people resides in rural areas (Census, 2001). Rural poverty is largely the outcome of unemployment and low agricultural productivity (IFAD, 2001) Rural to Urban migration has shown significant increase whereas urban to urban migration seems to be declining (UNDP, 2009).

METHODOLOGY OF THE STUDY

This study has been carried out with the help of collection of both primary and secondary data. Secondary data and information was collected from various internet sources. Primary data was collection through a cross sectional survey composing of interviews conducted using a structured questionnaire. The main focus was on demographic characteristics, particulars of households, reasons for migration and result of migration on income and satisfaction level. A sample of one hundred was covered under the study. With the help of structured interview schedules, relevant information was gathered from migrant respondents. The migrant was defined as a person who had migrated from a rural area of district Amritsar to urban Amritsar for any reason in the last five years. Fieldwork was carried out during the period January to February, 2011. Data was entered and analysed using SPSS software.

RESULTS AND DISCUSSIONS

Mean age of the respondents was found to be 40.8 years while median age was 40.0 years. It means that the migrants prefer to migrate at prime productive years of their life. Ninety five percent of the respondents were male. Around 84 percent of the total respondents were literate. Prior to migration, almost one-third (31 percent) of the respondents had annual income below Rs. 10,000/- while only 15 percent each had annual income in the range of Rs. 30,000/- to Rs. 40,000/- and above Rs. 40,000/-.

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[7] http://www.census2011.co.in/district.php
[8] http://en.wikipedia.org/wiki/Amritsar#Demographics
[9] http://www.iomindia.in/migration_in_india.html

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TABLE 2: BACKGROUND CHARACTERISTICS OF RESPONDENTS

Characteristics	Percent (N=100)
Age	
Mean age (years)	40.8
Median age (years)	40.0
Sex	
Male	95.1
Female	4.9
Literacy	
Literate	83.6
Illiterate	16.4
Annual Income (Indian Rupees)	
Below Rs. 10,000	31.1
Rs. 20,000 - Rs. 30,000	39.3
Rs. 30,000 - Rs. 40,000	14.8
Above Rs. 40,000	14.8

An analysis of push factors reveals '*Low paying jobs*' and '*Poor economic opportunities*' as the top two underlying factors for migrating from rural area to urban. Nearly two third (66%) of the respondents stated *low paying jobs* as the first factor followed by 38 percent reporting *poor economic opportunities* in rural areas. The third prominent factor marked out was '*economic insecurity*' which was reported by thirty percent while another twenty five percent stated the factor to be *poor economic opportunities.* As a fourth leading factor, *poor educational facilities* were reported by 26 percent of the respondents followed by 20 and 16 percent of the respondents reporting '*economic insecurity*' and '*social insecurity*' respectively. *Caste Discrimination* was stated only as the last seventh as a factor by around 61 percent of the respondents.

TABLE 3: PUSH FACTORS BY RANKING

Factors	N	1	2	3	4	5	6	7	Total
Caste discrimination	100	0.0	0.0	4.9	9.8	11.5	13.1	60.6	100
Social political discrimination	100	0.0	4.9	4.9	13.1	16.4	47.5	13.1	100
Low paying jobs	100	65.6	9.8	6.6	8.2	6.6	1.6	1.6	100
Poor educational facilities	100	9.8	29.5	21.3	26.2	6.6	1.6	4.9	100
Poor economic opportunities	100	19.6	37.7	24.6	6.6	4.9	4.9	1.6	100
Social insecurity	100	4.9	8.2	6.6	16.4	37.7	14.8	11.5	100
Economic insecurity	100	4.9	11.5	29.5	19.6	14.8	14.8	4.9	100

An analysis of pull factors was done to know factors attracting migrants to urban areas. Consistent in line with the push factors, *better economic opportunities* was reported by 71 percent of the respondents as the first pull factor. *Good education facilities* in urban areas was reported as second pull factor by around one-thirds (31%) of the respondents. Around thirty percent stated availability of *health facilities* as the third prominent factor. Once again, *good educational facilities* were reported as an important pull factor by 18 percent followed by 15 and 13 percent reporting the factors to be *mechanization* and *availability of health facilities* respectively. *Good transportation* facility in urban areas was reported by 21 percent of respondents as fifth important factor along with 20 percent stating *health facilities* as another factor. The sixth and seventh prominent factors were found to be *availability of sanitation facilities* (35%) and *Information Communication Technological facilities* (27%) respectively.

TABLE 4: PULL FACTORS BY RANKING

Factors	1	2	3	4	5	6	7	8	Total
Health facilities	6.6	26.2	29.5	13.1	19.6	4.9	0.0	0.0	**100.0**
Recreational facilities	1.6	4.9	13.1	11.5	13.1	26.2	16.4	13.1	100
Good Education Facilities	19.6	31.1	16.4	18.0	3.3	3.3	6.6	0.0	100
Mechanization	1.6	8.2	13.1	14.8	14.8	13.1	14.8	19.6	100
Better Economic Opportunities	70.5	13.1	4.9	3.3	1.6	3.3	3.3	0.0	100
Sanitation facilities	1.6	1.6	6.6	8.2	14.8	14.8	34.5	18.0	100
Transportation facility	1.6	16.4	11.5	11.5	21.3	19.6	8.2	3.3	100
Information Communication Technological facilities	1.6	0.0	3.3	8.2	13.1	14.8	14.8	43.3	100

Post-migration to the urban areas respondents were enquired about increase in income and satisfaction level. Eighty eight percent of the respondents reported an increase in income while 90 percent expressed their satisfaction as a result of migrating.

TABLE 5: INCREASE IN INCOME AND SATISFACTION POST MIGRATION

Factors	Percent
Has your income increased?	
Yes	88.0
No	12.0
Are you satisfied after migration?	
Yes	90.2
No	9.8

The phenomenal increase in population in the cities is one of the main reasons for poverty in the urban areas of India. A major portion of this additional population is due to the large scale migration of rural families from villages to cities. This migration is mainly attributed to poor employment opportunities in villages.

CONCLUSION

With this we conclude that, migration occurs at prime productive age leading to greater opportunities for migrants in urban area and in fact plays a decisive role in adjustment, growth, sustainability and satisfaction level. Most of the rural to urban migrants are poor, illiterate and male family members who migrate to urban areas looking for better and sustained economic opportunities. The study concludes that, migration occurs at prime productive age and the leading push factors are 'low paying jobs' and 'poor economic opportunities' as the two main reasons. The other prominent factors were found to be economic security and poor educational facilities. Consistent in line with the push factors, better economic opportunities, good education facilities, availability of health facilities were the top three factors. Good transportation facility along with sanitation facilities and Information Communication Technological facilities were other factors. Post-migration, four-fifths of the migrants reported an increase in income while the majority was satisfied with their decision of migrating to urban.

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CONCEPTUAL FRAMEWORK OF PERFORMANCE MANAGEMENT: AN INDIAN PRESPECTIVE

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ABSTRACT

For achieving the strategic objective of sustained & speedy growth, managing human resource has featured as a vital requirement in all organizations. Performance management is a critical component for achieving and maintaining effectiveness of individuals and organizations. Performance management system is the entire gamut of activities from performance planning to performance enhancement. Presence of such a system in an organization provides opportunities to individuals and teams in the organization receive feedback about their performance. This paper provides a conceptual framework of performance management which is now believed to be used in some form or other in most organisations. We begin by defining performance management and objective of Performance management system. We then consider the performance management process by applying a critical lens to some of the main approaches set out thus far. Following this, we consider the Indian cases which are related to the performance management systems.

KEYWORDS
Performance, Performance management system, 360 degree feedback, Performance appraisal.
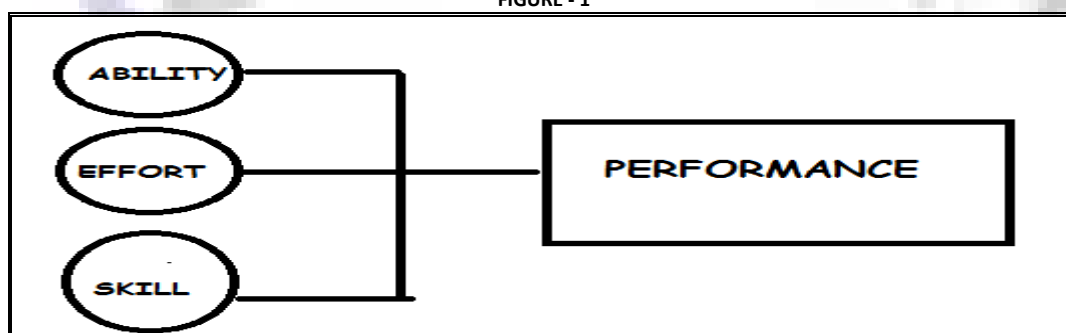
INTRODUCTION

All managers monitor the way employees work & assess how this matches organisational needs. They form impressions about the relative value of employees to the organisation & seek to maximize the contribution of every individual. The evolution of the concept of performance management as a new HRM model reflect a change of emphasis in organisation away from command and control toward a facilitation model of leadership. This change has been accompanied by recognition of the importance to the employee & the institution of relating work performance to the strategic and overarching mission of the organisation as a whole. The performance management process provides opportunities for the employee & performance managers to discuss development goals and jointly create a plan for achieving those goals. Biocon limited, the Bangalore based company of India origin has experienced exponential growth in last decade and by the end of 2008, it had revenue of Rs.9.9 billion. The company had only 300 employees in 1994 & by December 2007, the employee strength was 3000. During this phase, the company faced the challenge of aligning the goals with that of the of its employees organisation & achieving this is the shortest possible time. Biocon decided that performance management was a dynamic tool to help it continue to grow at a fast pace. Since it maximize employee performance & keeps them motivated in the right direction.

Infact in a survey of employees conducted by Mercer, Human resources consulting, only a third of the 2600 respondents had received a formal performance evolution in the past year, and only 26 percent receive regular coaching from their managers on improving performance. Of those who said they would had a formal performance evaluation in the past twelve month, 62% expressed a strong sense of commitment to their organisation, compared to 49 % of employees who had not.[17]

WHAT IS PERFORMANCE
Performance is what is expected to be delivered by an individual or a set of individuals with in a time frame. What is expected to be delivered could be stated in terms of results or effort, tasks & quality, with specification of conditions under which it is to be delivered. [12]
Performance depends up on the right combination of effort, ability and skill.

FIGURE - 1

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Performance can be managed better if the nature of inputs required to be put in case be envisaged without mistake, planned properly & Implemented. Performance equation says that any individual's performance is a function of three sets of factors: ability or competence to perform various tasks or work effort to carry out the tasks & the organisational support one gets to carry out these tasks. If any one of these is less the performance is bound to be poor. In this equation performance is output & work effort is the input & the ability and organisational support are the intervening variable. If inputs (ability, work effort or motivational and organisational support) are inadequate the performance is also likely to be inadequate. The Table-1 highlights the factors which influence performance of an employee. [13]

FACTORS THAT INFLUENCE PERFORMANCE

TABLE - 1

MOTIVATION	ENVIRONMENT	ABILITY
Career Ambition	equipment	technical Skill
employee Conflict	Job design	Interpersonal
Frustration	economic Conditions	problem Solving
Fairness/Satisfaction	Unions	Analytical
goals/Expectation	rules & Policies	communication
	management Support	Physical Limitations
	Laws & Regulations	

Performance is a result of both ability and efforts. A highly capable individual may need to put in only marginal effort to give high performance where as another individual with low ability may need to put in a lot of effort to produce even an average level of output. If only output is rewarded highly capable employees may get a lot of leisure time in addition to reward where as those putting in high efforts may get consistently low ratings. Performance on different functions should be assessed generally in terms of effort put in by the individual in relation to his capability.

WHAT IS PERFORMANCE MANAGEMENT

Performance management never just means with a subordinate, once or twice a year to "review your performance". It means setting goals that make sense in terms of the company's strategic aims. It means daily or weekly interactions to ensure continuous improvement in the employee's capacity & performance. [3] And it means ensuring that the employee has the training he or she needs to perform the job. It is a process of creating a work environment in which people can perform to the best of their abilities. [9] Performance management takes a life cycle view of employee performance & sees an integrated process which is linked to the attainment of corporate goals, business processes while at the same time helping the individual to attain his career goals & group goals effectively. Employee performance management includes:-

- Planning
- Monitoring
- Developing
- Rating
- Rewarding

The aim of performance management as a business process is to align corporate goals with the individual objectives, ensures individual readiness to achieve objectives and evaluate & reward individual performance in terms of those objectives.
Performance management system includes-
1. Development of clear job description
2. Selection of the right people.
3. Negotiate requirements & accomplishment based performance standard, outcomes & measures.
4. Provide effective orientation, education & training.
5. Provide on going coaching & feedback.
6. Carry out quarterly performance development discussions.
7. Design effective compensation & recognition system to reward people for the contribution.
8. Ensure promotional/career development opportunities.

A process that consolidated goal setting, performance appraisal & development in to a single, common system, the aim of which is to ensure that the employee performance is supporting the company's strategic aims.

OBJECTIVES AND ASPECTS OF PMS
The main objective of performance management is continuous improvements in performance with a view to attaining organizational goals. The performance improvements need to be seen in terms of achievement of the objectives and goals of the organization. The PMS process has two clear objectives:

a. THE EVALUATION OBJECTIVE
• Evaluating & assessing the readiness of an individual to accept higher responsibilities
• To appraise the individuals of their current competency level and need to improve by giving them feedback
• To link it with compensation, rewards and career development.

b. THE DEVELOPMENT OBJECTIVE
• Counselling & coaching of the subordinates to improve their performance & upgrade their competencies
• To motivate subordinates through recognition and support
• To build rapport between superior and subordinate
• To diagnose individual & organizational competencies, so that actions can be taken on problem areas
• To define the training requirements based on individual competencies.

(B) ORGANIZATIONAL BENEFITS OF PMS
The PMS process helps organizations to:
• Serve as the primary vehicle for implementing organisational goals and strategies (cascaded from top to bottom throughout the organisation).
• Align and integrate the objectives and Key Performance Indicators (KPI's) of the organization vertically and horizontally through all job categories and levels, including management. In this way the entire system works together in pointing towards the critical bottom line MEASURES, with bottom line RESULTS following as a matter of course ("What gets measured gets done").
• Facilitate continuous performance improvement, organisation development and culture change.
• Achieve quality, efficiency and effectiveness, i.e. to meet the citizens' needs as precisely, quickly and economically as possible.
• Ensure clarity regarding work expectations and performance standards, reducing job holder anxiety/stress, resource wastage and conflict.
• Continually enhance employee competence through identification of output-related training and development needs and strategies.
• Reduce Line Manager reluctance and fear to do Performance Appraisals with their staff.
• Facilitate performance-based remuneration and rewards, so that employees can see and experience a clear link between their performance and the rewards they receive.

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(C) PROCESSES OF PMS

Performance management is a cyclical process which includes the following elements:

• Planning work & setting expectations
• Monitoring performance
• Developing the capacity to perform
• Rating performance
• Rewarding good performance

FIGURE - 2
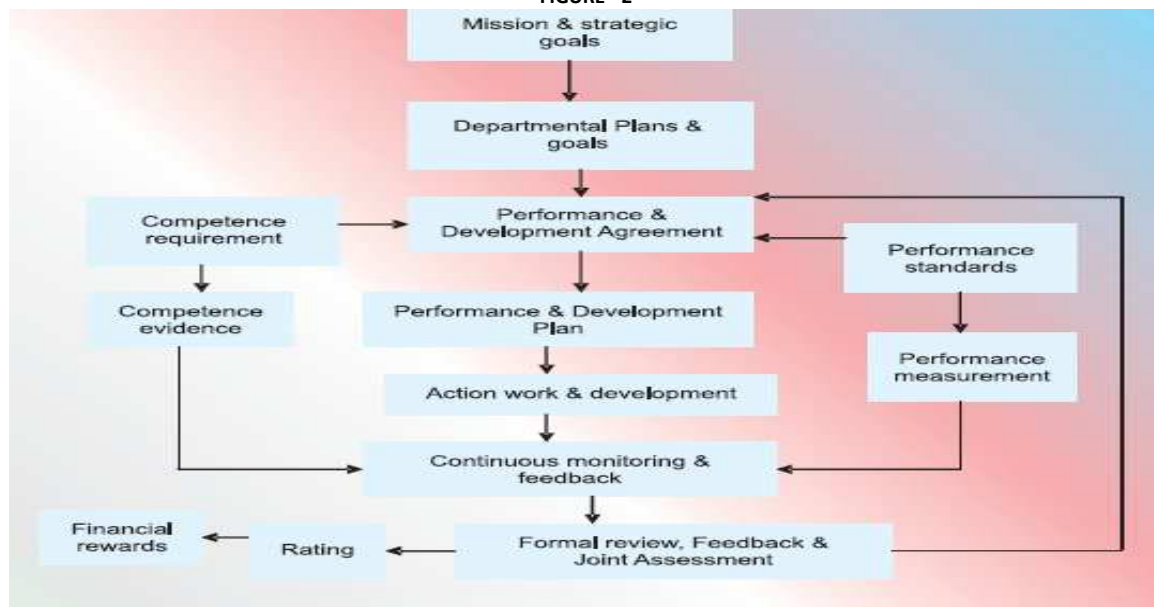
IDENTIFYING PERFORMANCE DIMENSION

Dimensions are an aspect of performance that determines effective job performance. An increasingly popular approach to identifying performance dimensions focus on competencies, the observable characteristics people bring with them in order to perform the job successfully. [15] Defining competencies as underlying and unseen characteristics leads to the same difficulties associated with defining & measuring performance as personality traits. The set of competencies associated with a job is often referred to as a competency model. Management experts point out that what is measured should be directly tied to what the business is trying to achieve. [7] Because measurement should be viewed as a management tool, not a measurement exercises. Many organisations are now identifying performance dimensions based on their strategic objectives. For example southwest Washington Medical center links corporate strategic goals to employee performance goals. This approach makes sure that every one is working together towards common goals [6]

(A) DIMENSION OF PERFORMANCE MANAGEMENT

Performance management involves thinking through various facts of performance, identifying critical dimensions of performance, planning, reviewing & developing & enhancing performance & related competencies.

FIGURE - 3
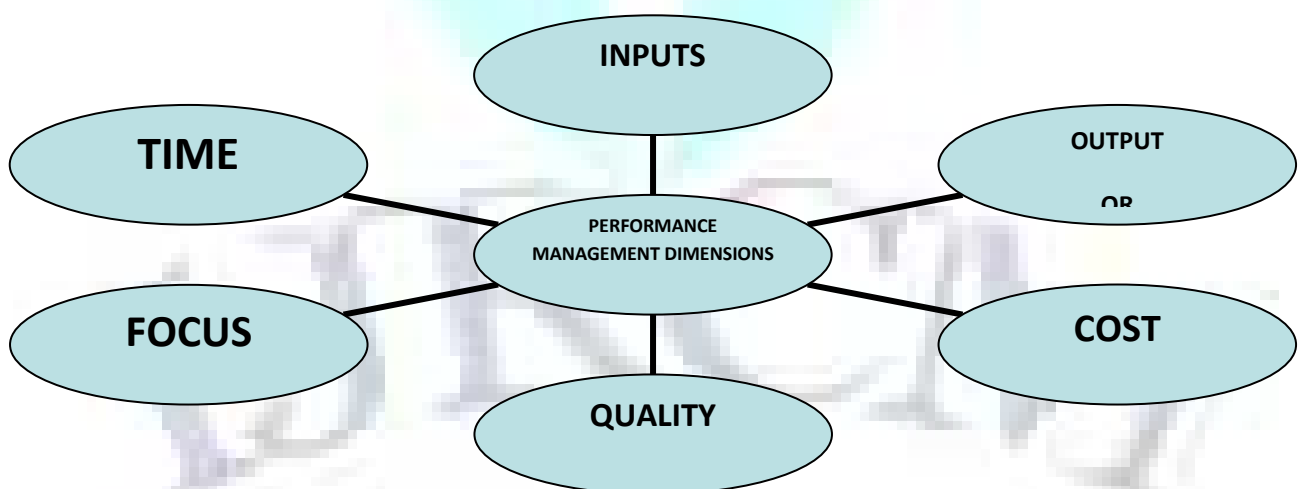
Normally all performance management starts with this final targeted performance. It is to achieve this performance output that performance activities need to be planned. Performance activities are the inputs to be given by the individual. The input dimensions deals with the activities or tasks to be accomplished by the individual. Performance can be managed better if the nature of inputs required to be put in can be envisaged with out mistake, planned properly & implemented. The time period for performance is important. Time for information technology organisation is limited to a quarter or a three- month period. Time may become the target. In the context of organisation performance of an individual in organisational setting may therefore be defined as the output delivered by an individual in relation to a given role during a particular period of time under the set of circumstances operating at that point of time. Thus in order to manage performance one has to have an idea of the expected level of performance, under what circumstances, the kind of support needed, the previous performance level of the individual or similar individual , under similar circumstances etc. The focus of performance can be on many other dimensions. It could be on quality or on cost or financial dimension. An important issue to be understood in performance management is input-output relationship.

Performance management consists of the following-

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- Defining performance taking in to account all the complexities (KPAs, tasks, etc.)
- Planning performance both in terms of the inputs, output, condition under which these are to take place, etc.(objectives, activities& targets etc)
- Measuring performance & understanding the limitation in measuring performance.
- Analysing performance & understanding what caused or contributed to it.
- Developing capabilities to perform or the capabilities to give inputs, possess competencies to convert the inputs in to desired outputs.
- Monitoring it & reviewing it.
- Recognising various dimensions of performance & rewarding it where appropriate.

WHY PERFORMANCE MANAGEMENT

If one were to spend several days in Toyota's Lexington, Kentucky, Camry Plant, the absence of "appraisal" as most of us know it would soon be apparent. Supervisors don't sit down with individual employees to fill out from & appraise them. Instead, teams of employee monitor their own results, continuously adjusting how they do things to align those results with the work team's standards & with the plant's overall quality and productivity needs. The fact that managers are emphasizing such a performance management approach reflects several things.

a) **Total quality**- It reflects the TQM concepts advocated by management experts like W. Edwards Deming. Deming argued that an employee's performance is more a function of things like training, communication tools & supervision than of his or her motivation. Performance management emphasis on the integrated nature of goal setting. Appraisal & development reflects these assumptions.

b) **Appraisal issues**- It reflects the fact that traditional performance appraisals are often not just useless but tense and counter productive.[11]

c) **Strategic Focus**- Performance management recognises that in today's globally competitive environment, every employee's competencies & efforts must focus on helping the company achieve its strategic goals. The basic idea is that management & each worker & work team should continuously monitor performance relative to goals & continuously improve results. Each employee & team must continuously improve performance from one period to the next.[4]

THE BUILDING BLOCKS OF AN EFFECTIVE PERFORMACE MANAGEMENT PROCESS

a) Direction sharing means communicating the organisation higher level goals throughout the organisation and then translating these in to do able departmental goals.

b) Role clarification means clarifying each employee's role in terms of his or her day to day work.

c) Goal setting & planning means translating organisational & departmental Goals in to specific goals for each employee.

d) Goal alignment means having a process in place that allows any managers to see the link between an employee's goal & those of the department & organisation.

e) Ongoing performance monitoring- includes using computer based systems that measures & then e-mail progress & exception reports based on the person progress towards performance goals.

f) Ongoing feedback includes face to face & computer based feedback regarding progress toward goals.

g) Coaching & support should be an integral part of the feedback progress.

h) Performance assessment is just one element in the performance management progress. The focus in performance management should be on planning & influencing how the employee's performance produces improved company results.

i) Reward recognition & compensation all play a role in providing the consequences needed to keep the employee's goal-directed performance on track.

j) Workflow, process control & return on investment management means making sure that the employee's performance is linked in a meaningful way via goal setting to the company's overall measurable performance.

CREATING THE TOTAL PERFORMANCE PROCESS

Performance management starts at the end & works back. Perhaps the best way to illustrate how to crate a total performance management process is to look at how one company, TRW did so. With over 100,000 employees in 36 countries on 5 continents, administering employee appraisal & managing performance is a complicated process in a company like TRW. [5]

Several years ago, the firm was deeply in debt.TRW's top management knew it had to take steps to make the firm more competitive & performance driven. At the time, most of the firm's far flung departments used their own paper-based appraisal systems. Top management decided that a company wide performance management system was a top priority. Top management identified a special team & charged it with creating a "One company, One system" performance management system.

The team consisted of several information technology experts & key HR representatives from the business units. The team and its team meetings were entirely web-based & virtual. Their aim was to quickly develop a performance management system that was consistent in that employees in TRW's entire far-flung organisation could use the same system. It also had to be comprehensive in that it consolidated the various components of performance management in to a single common system. For TRW, these components include goal setting, performance appraisal, professional development & succession planning. The team created an online system, one in which most TRW employees & supervisor worldwide could in put & review their data electronically. To facilitate filling in the online form's pages, the team created a wizard that leads the user from step to step.

In practice, either the employee or manager can trigger the performance management process by completing the appraisal & sending it to the other. Once the employee finishes the online form, system –generated e-mail notifies the manager that the form is ready for review. The new performance management system has produced many benefits. It focuses everyone's attention on goal-oriented performance, it identifies development needs, and it gives managers instant access to employee performance data. The result is an integrated, goal-oriented employee development & appraisal performance process.

When we can say that the system is working well------------?

The following are the criteria for the system to work well:

- Line mangers take it seriously & the performance plans are completed on time for 80 percent of the cases in any given year.
- Line mangers spend adequate time in performance planning and review discussions. Adequate time may mean about one day or 8 to 10 hours per employee per year of which 4 hours should be individual time.
- The performance plans achieve the objectives of clarifying goals, roles & time frame & performance standard for each department & individual.
- The performance review discussions conducted are of quality & 80 percent of the employees look forward to these with enthusiasm & treat them as learning opportunities.
- Organisational support is planned in the form of removing bottlenecks, arranging training programmes, job –rotation & the like after performance planning sessions.
- A performance culture is generated in the organisation & the performance management system is a part of it & may even be one of the reasons for its generation.

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INDIAN CASES RELATED TO PERFORMANCE MANAGEMENT
1. PERFORMANCE MANAGEMENT SYSTEM AT TITAN
BUSINESS SCENARIO

Titan strongly believes that the success of Performance management system shall depend on how the whole HRM processor or are in place in the organisation. We have nurtured a culture, where every employee targets right first time & every time as a way of life. Our recruitment process it self acts as important support for the success of Performance management system in Titan.

OBJECTIVES OF PERFORMANCE MANAGEMENT SYSTEM IN TITAN

- To create role clarity & clarify performance expectations & measure at individual, group & organisational levels.
- To provide job guidance, feedback & counselling to build strength & areas of improvement so as to bridge the gap between performance & expectations.
- To build a positive work relationship between the appraiser & the appraisee through a two way dialoguing communication process.
- To identify the training & development needs of employees.
- To unleash the creative capabilities of our employees.
- To encourage superior performance measuring strech goals.
- To promote a performance culture as a Titan culture of excellence.

PERFORMANCE MANAGEMENT SYSTEM PROCESS IN TITAN

FIGURE - 4
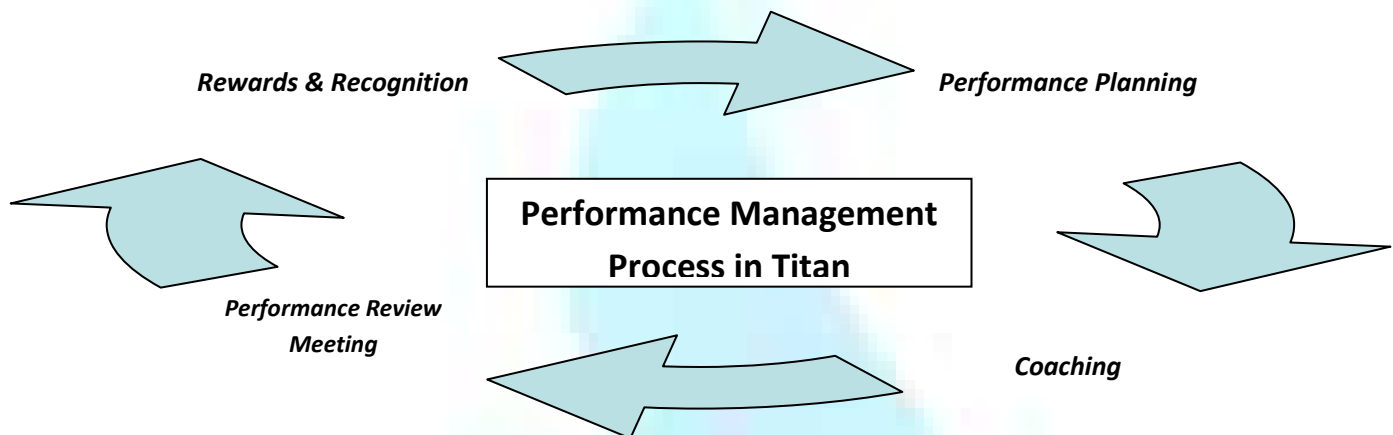
In Titan, performance management is both a process & a system. It is a process of creating a work environment in which people are able to perform to the best of their abilities. The Performance management system is a whole work system that begins when a job is defined as needed. It ends when an employee leaves the organisation. In Titan a lot of importance given to performance review discussion. [14]

2. PERFORMANCE MANAGEMENT SYSTEM IN INFOSYS

Infosys believes in meritocracy & has built a high performance work culture among its workforce. In order to align the performance of employees with the business goals of Infosys, regular driven appraisals are conducted. Infosys has 3 tracks for performance management:

TRACK-1

It deals with performance reviews based on tasks & feedback on personality/technical competencies. Infosys is moving to a role based structure & competencies for each of the roles, with standard expected levels of behaviours have been identified. Individuals are given expected levels of behaviours having been identified. Traning needs are derived based on the tasks evaluation & competency feedback. Track 1 is primarily used for junior & middle management of Infosys.

TRACK-2

It is the senior management appraisal. People in managerial roles undergo this annually. Here the employee fills up a self appraisal form & carries it forward to a panel discussion. The panel includes the head of department, the immediate supervisor of the appraisee as well as senior person from another department.

TRACK-3

360 degree appraisal constitutes the third track. This has happening over the last 3 years, for all department & practice units. Levels covered include the head of delivery, head of department, practice units, all the people who report to the heads & all others holding leadership positions in the organisation. The feedback from 360 degree appraisal is used as developmental inputs & leaders of Infosys are helped in converting these feedbacks in to personal development plan.

These, of course, are space to enter strengths as well as areas of improvement by each of the respondents.[18] All feedback across the organisation is obtained & each person's report provides a comparison of his/her item-wise scores, Vis a Vis the company average. In addition to this, Peer feedback for the management council has been institutionalised. However the concern today lies in having a scalable model for MC, given the variety of the functional background of the people.

Next Steps-

a) Identifying low performers & helping them come out with personal improvement plans.

b) Having moved to a role based structure & the performance management to a role-based process; training is getting linked to this.

c) Strengthening the objective setting process for each employee & linking them to organisational business goals are currently being actively pursued.

These activities will undoubtedly establish a strong performance work ethics in Infosys.

3. PERFORMANCE MANAGEMENT SYSTEM IN BPCL

Bharat Petroleum Corporation Limited is an oil major engaged in refining & marketing the full range of petroleum products in India. Prior to 1999, the company had a performance appraisal system, which focused largely on personality & behavioural traits. Triggers for the new system came from-

a) People's aspirations for a transparent & open system.

b) Changing business environment & market competition & focus on performance & results.

c) Sustaining Organisational transformation process undertaken by the company after restructuring.

The performance management system was developed based on the following principles.

1. Business Driven
2. Team work
3. Communication
4. Development
5. Transparency
6. Consistency

The specific aims of the system were to-

- Create awareness of corporate & business goals.

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- Translate such goals in to tangible objectives & measures for teams & individual.
- Identify competencies.
- Foster development of each & every management staff.
- Establish process of continuous feedback on performance.

Components of the system:-

- Performance against predefined targets with a weight age of 70%.
- Corporate value with a weight age of 14 %.
- Critical attributes with a weight age of 16%.

Challenges in Implementation & stabilisation of the system:-

All major HR initiatives require settling in time so also performance management systems. The HR department is carefully monitoring the system so that it achieves its deserved objectives. There was positive outcome in the very first year of its implementation viz-

- Discussion amongst team members & appraiser/ appraisee brought about role clarity.
- Business plans are being converted in to performance measures & incorporated in to individual performance plans.
- Overlapping roles in terms of two or more individual having similar accountabilities are being identified.
- Staffs are voluntarily seeking value added jobs with stretch targets.

The system also surfaced area of concern-

- Leadership ability in setting challenging goals.
- Ability to give negative feedback on behavioural aspects.
- Timeliness in completing the entire process.
- Tendency to overrate, since the system is open.

While the system is owned & managed by the respective user department, the HR department monitors it on overall basis.

4. PERFORMANCE MANAGEMENT SYSTEM IN INDIAN CIVIL SERVICE

The ACR system followed in the public sector has become ritualized & is not saving any purpose. The only feedback was in the case of poor performance rating. Sensing that such a system is not suited to the requirements of modern India, the government of India has introduced a new system of performance appraisal for civil service officers. The new system which is at the early stages of its introduction has objectives such as being a tool for career planning & development. In addition to measuring performance achievement. [16]

Every officer has to develop an annual work plan & has to discuss it with the supervisor. The supervision also has to give mid-year feedback & conduct the final evaluation in an open manner. All officers will have access to their final performance scores, thus removing the curtain of confidentiality. A year after its adoption by the Indian Administrative services the Government of India has extended the system to all Groups-A Central services.

5. PERFORMANCE MANAGEMENT SYSTEM IN APTECH LIMITED

The global learning solutions company, Aptech's Comprehensive performance management system, Oasis, was introduced in 2002. [1] Initially all employees were appraised on the basis of their activities and later for their achievement in terms of present targets on 5 point scale. The shift to Oasis was to include performance linked reward management & career growth to the traditional assessment of achievement.

The system has three components.

- Objective Assessment
- Subjective Impression
- Sharing

Overall assessment through Oasis is used for rewarding employees as well as planning their growth in the organisation. [8]

IDENTIFYING THE CAUSES OF PERFORMANCE PROBLEMS

Performance can be the result of many factors, some of which are beyond the worker's control. In most work situations, through, supervisors tend to blame the worker when they observe poor performance; while workers tend to blame external factors of performance deficiencies accurately that mangers determine the causes can influence how performance is evaluated. [2] Secondly, casual determination can be unspoken & underlying sources of conflict between supervision & their workers. Thirdly, the cause affects the type of remedy selected; what is thought to be the cause of performance problem determines; what is done about it.

A major inclusive version of the causes of performance embraces three factors.

- Ability
- Motivation
- Situational

The **ability** factor reflects the worker's talents & skills including characteristics such as intelligence, interpersonal skill & job knowledge.

Motivation can be affected by a number of external factors (such as rewards & Punishment) it is up to the workers to determine how much effort to exert on any given task.

Situational factors include a wide array of organisational characteristics that can positively or negatively influence performance.

Situational factors to consider in determining the causes of performance problems-

a) Poor coordination of work activities among workers.
b) Inadequate information or instructions needed to perform a job.
c) Low quality materials.
d) Lack of necessary equipment.
e) Inability to obtain raw materials, parts or suppliers.
f) Inadequate financial resources.
g) Poor supervision.
h) Uncooperative co-workers & poor relations among people.
i) Inadequate training
j) Insufficient time to produce the quantity or quality of work required.
k) Equipment breakdown.
l) A poor work environment.

CHALLENGES OF PERFORMANCE MANAGEMENT

Many organisation lack formal or structured mechanism to ensure that individuals at all levels of an organisation hierarchy are focussed on activities & tasks which directly relates to the higher level corporate goals & strategies. Though individuals are focused on the right objectives & activities, the environment & tools necessary to successfully achieve the desired results may not be available or easily accessible. Lack of any consistent approach & process for evaluating & rewarding the performance results in relation to attainment of organisational objectives. [10]

Now the challenges how to manage the performance of your employees you have to get right person in a organisation to mange your business. The challenge should be to create a performance culture where you can provide opportunity for enhance performance; where optimum performance become a way life. Most

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companies have sophisticated systems that provide frequent feedback to employees & allow them to provide feedback on their managers. At HCL technology, employees not only review their managers, these appraisals are posted on the company intranet so everyone can review the employee assessment. Parameter includes performance strategic vision, ability to communicate, problem solving skill & responsiveness.

There are some organisations, facing performance management as challenge

- As the organisation are ruled as per hierarchy bases people (Subordinates) do not open about their boss.
- Verteran kind of managers.
- Power & politics exists in organisation.
- Majorly vertical (Top to Down) communication exists.

Other major challenges are –

a) Cascading corporate goals to individual goals.
b) Linking performance management with other existing corporate performance measurement system.
c) Quantifying the targets measuring them.
d) Elimination of duplication in key result areas(KRAs)
e) Minimising the overlaps while maintaining the links between KRAs.
f) Having action plans for all group falling under normal curve.
g) Communicating the results-at various business conditions.
h) Training the evaluator-appraisers, reviewers.
i) Methodology to follow for rewarding.
j) Succession planning process to be linked to this.

CONCLUSION

Performance Management is a term used to improve team performance, based on the principles of measurement, appraisal, action and monitoring. However, it can be manifest in very different forms depending on whether the aim is to further improve good performers, or deal with underperformance. Performance Management can also apply to individuals, teams, groups or organisations. Performance management essentially about measuring, monitoring and enhancing the performance of staff, as a contributor to overall organisation performance. It involves goal setting, performance appraisal, and reward system that align member work behaviour with business strategy, employee involvement, and workplace technology. Performance management interventions traditionally are implemented by the human resources department with in organisations, whose managers have special training in these areas. Because of the breadth and depth of knowledge required to carry out these kinds of change programs successfully, practitioners tend to specialize in one part of the human resources functions, such as performance appraisal or compensation.

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A COMPARATIVE STUDY OF WORK AUTONOMY AND WORK ENVIRONMENT OF SELECTED ENGEENIARING UNITS OF VITTHAL UDYOGNAGAR

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ABSTRACT

Work autonomy & environment is concerned with providing autonomy to non-managerial staff to make autonomous decisions without consulting a boss/manager & providing better working environment to them. This paper attempts to analyze the practice followed by selected engineering units regarding work autonomy & environment. The rational of the study is, to study comparative analysis of work autonomy and work environment in different engineering units and to analyze role of work autonomy and work environment in different engineering units.

KEYWORDS
Work autonomy, work environment, HRM.

INTRODUCTION
Work autonomy is concerned with giving freedom to employees in their work. This improves their initiatives and skills. The presence of a good leader helps to guide and instruct the work force in a better manner. This improves their attitude towards work. Better relationship builds up their attachment and belongingness towards the organization. This is an important aspect as this helps in developing a loyal, dedicated, motivated and productive workforce. Performance improves their productivity. Work autonomy is considered as essential element in creating productive environment, contributing to its success. This is also considered as one of the pillar of success for both enhancing and maintaining competitiveness for organizational development.

RESEARCH METHODOLOGY
The researcher has been taken three units i.e. Elecon Engineering Co. Ltd, Anupam Industries Ltd., Torrent Cables Ltd for the study. Research design is prototype model of entire research work. Here my objective of study is to the application of the concept of work autonomy and work environment in different industrial units for which descriptive research design is used. Structured Questionnaire is used for collecting data. Data are analyzed using appropriate software techniques such as SPSS. Data are tabulated and graphical presentation is also done. Statistical tests such as Chi-square and Co-relation are used to test the hypothesis.

ELECON
Soon after India's independence, Elecon started making its presence felt in industrial scenario in most productive and enriching manner. This process has its root as far back as 1951.
A dynamic visionary late Shri Ishwarbhai B. Patel made a small beginning that was destined to have a glorious present and spectacular future in 1951 in Bombay. A small firm indigenously manufacturing conveying equipments started spreading its wings in the area so far unexplored, resulting in valuable savings in foreign exchange outflow. With obvious increase in business operations, it was converted into a Private Limited Company on 11th January 1960.

ANUPAM INDUSTRIES LTD.
The foundation of **Anupam** was laid in 1973 by Entrepreneur technocrat **Shri J.C. Patel**, who had gained rich experience of a decade in crane designing at Heavy Engineering Corporation, Ranchi.
Shri J.C. Patel founder Chairman can derive the genuine satisfaction on seeing his humble effort ultimately having borne and grown into what is today called.

TORRENT CABLES PVT. LTD.
Shri U.N. Mehta pioneered the concept of 'niche marketing' in the Indian Pharma industry almost four decades ago. In the mid-90s, with steady and increasing returns from its Pharma business, the Company diversified into Power sector**.**

STATISTICAL ANALYSIS & INTERPRETATIONS
STATISTICAL ANALYSIS
In this analysis part, the researcher has done two statistical tests named "K-P Correlation" and "Chi – Square". Here I have obtained sum of answer coding of questions related to different variable like organizational efficiency, employee's autonomy, morale, etc. This information is used to obtain correlation coefficients. I have also calculated mode values for answer coding of questions related to different variable and used it to calculate Chi – square values.
In both the tests I have calculated p-values. The statistical significance is fixed at 5% level of significance. i.e. if p-value is less than 0.05, reject Ho otherwise accept it.

H_0 :   Employees feeling of autonomy is not related to organizational efficiency
H_1 :   Employees feeling of autonomy is related to organizational efficiency
H_0 :   Organizational work environment is not affected employee's satisfaction level
H_1 :   Organizational work environment is affected employee's satisfaction level
H_0 :   Clear communication, feedback and participative work environment is not affect employee's morale
H_1 :   Clear communication, feedback and participative work environment is affect employee's morale

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TABLE – 1: CORRELATION BETWEEN VARIOUS PARAMETERS

Variable - 1	Variable – 2	Correlation coefficient (r)	p-value
Employee's autonomy	Organizational efficiency	0.430	0.001
Organizational work environment	Employee's satisfaction	0.788	0.000
Communication, participative work environment	Employee's morale	0.338	0.008

(a): ANUPAM INDUSTRIES LTD.

Variable – 1	Variable – 2	Correlation coefficient (r)	p-value
Employee's autonomy	Organizational efficiency	0.199	0.401
Organizational work environment	Employee's satisfaction	0.665	0.001
Communication, participative work environment	Employee's morale	0.735	0.000

(b): TORRENT CABLES PVT. LTD.

Variable – 1	Variable – 2	Correlation coefficient (r)	p-value
Employee's autonomy	Organizational efficiency	0.508	0.022
Organizational work environment	Employee's satisfaction	0.377	0.101
Communication, participative work environment	Employee's morale	0.132	0.58

(c): ELECON ENGG. CO. LTD.

Variable - 1	Variable – 2	Correlation coefficient (r)	p-value
Employee's autonomy	Organizational efficiency	0.657	0.002
Organizational work environment	Employee's satisfaction	0.452	0.046
Communication, participative work environment	Employee's morale	0.227	0.336

There is weak positive relationship between employee's autonomy and organizational efficiency. The correlation coefficient is 0.430 with p-value 0.001. Thus null hypothesis H_{01} is rejected. The relationship is statistically significant.

There is strong positive relationship between employee's satisfaction and organizational work environment. The correlation coefficient is 0.788 with p-value 0.000. Thus null hypothesis H_{02} is rejected. The relationship is statistically significant.

There is weak positive relationship between employee's morale and communication, participative work environment. The correlation coefficient is 0.338 with p-value 0.008. Thus null hypothesis H_{03} is rejected. The relationship is statistically significant.

CROSS TABLES

TABLE 2:   EMPLOYEE'S FEELING OF AUTONOMY V/S ORGANIZATIONAL EFFICIENCY IN:

(A): ANUPAM INDUSTRIES LTD.

Employee's autonomy	Organizational efficiency		Total
	Yes	No	
Yes	14(87.5%)	2(12.5%)	16(100.0%)
No	4(100.0%)	0(0.0%)	4(100.0%)
Total	18(90.0%)	2(10.0%)	20(100.0%)

Chi – square value is 0.556 with p-value 0.456. There is no significant association between employee's autonomy and organizational efficiency.

(B): TORRENT CABLES PVT. LTD.

Employee's autonomy	Organizational efficiency		Total
	Yes	No	
Yes	14(93.3%)	1(6.7%)	15(100.0%)
No	2(40.0%)	3(60.0%)	5(100.0%)
Total	16(80.0%)	4(20.0%)	20(100.0%)

Chi – square value is 6.667 with p-value 0.01. There is significant association between employee's autonomy and organizational efficiency.

(C): ELECON ENGG. CO. LTD.

Employee's autonomy	Organizational efficiency		Total
	Yes	No	
Yes	15(100.0%)	0(0.0%)	15(100.0%)
No	3(60.0%)	2(40.0%)	5(100.0%)
Total	18(90.0%)	2(10.0%)	20(100.0%)

Chi – square value is 6.667 with p-value 0.01. There is significant association between employee's autonomy and organizational efficiency.

TABLE–3: EMPLOYEE'S SATISFACTION V/S ORGANIZATIONAL WORK ENVIRONMENT

(A): ANUPAM INDUSTRIES LTD.

Organizational work environment	Employee's satisfaction		Total
	Yes	No	
Yes	18(100.0%)	0(0.0%)	18(100.0%)
No	2(100.0%)	0(0.0%)	2(100.0%)
Total	20(100.0%)	0(0.0%)	20(100.0%)

There is significant association between employee's satisfaction and organizational work environment.

(B): TORRENT CABLES PVT. LTD.

Employee's autonomy	Employee's morale		Total
	Yes	No	
Yes	17(100.0%)	0(0.0%)	17(100.0%)
No	3(100.0%)	0(0.0%)	3(100.0%)
Total	20(100.0%)	0(0.0%)	20(100.0%)

There is significant association between employee's autonomy and organizational efficiency.

(C): ELECON ENGG. CO. LTD.

Employee's autonomy	Employee's morale		Total
	Yes	No	
Yes	14(100.0%)	0(0.0%)	14(100.0%)
No	5(100.0%)	0(0.0%)	5(100.0%)
Total	20(100.0%)	0(0.0%)	20(100.0%)

There is significant association between employee's autonomy and organizational efficiency.

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TABLE–4: CLEAR COMMUNICATION, FEEDBACK AND PARTICIPATIVE WORK ENVIRONMENT V/S EMPLOYEE'S MORALE

(A): ANUPAM INDUSTRIES LTD.

Communication, participation	Employee's morale		Total
	Yes	No	
Yes	15(83.3%)	3(16.7%)	18(100.0%)
No	0(0.0%)	2(100.0%)	2(100.0%)
Total	15(75.0%)	5(25.0%)	20(100.0%)

Chi – square value is 6.667 with p-value 0.01. There is significant association between employee's morale and Clear communication, feedback and participative work environment.

(B): TORRENT CABLES PVT. LTD.

Communication, participation	Employee's morale		Total
	Yes	No	
Yes	14(82.4%)	3(17.6%)	17(100.0%)
No	2(66.7%)	1(33.3%)	3(100.0%)
Total	16(80.0%)	4(20.0%)	20(100.0%)

Chi – square value is 0.392 with p-value 0.531. There is no significant association between employee's morale and Clear communication, feedback and participative work environment.

(C): ELECON ENGG. CO. LTD.

Communication, participation	Employee's morale		Total
	Yes	No	
Yes	14(100.0%)	0(0.0%)	14(100.0%)
No	5(83.3%)	1(16.7%)	6(100.0%)
Total	19(95.0%)	1(5.0%)	20(100.0%)

Chi – square value is 2.456 with p-value 0.117. There is no significant association between employee's morale and Clear communication, feedback and participative work environment.

CONCLUSION

But to satisfy a human being is not an easy task. This is so because "Money does not serve all the purposes". It has been rightly said that "Money is a good slave but a bad master". Therefore it is important for an organization to adopt policies regarding work autonomy and work environment to satisfy employees so that the desired goals of both the organization as well as employees can be achieved easily. It was found that all the three organizations have some limitations in providing work autonomy adequate free working environment but majority of employees look satisfied from the policies and environmental conditions provided by the organizations.

Work autonomy and work environment helps in maintaining good industrial relations.

Organizations that would like to be dynamic and growth oriented have to pay great attention to the development of its human resources. People must be continuously helped to acquire capabilities needed for effective performance of organizational functions/roles/tasks that may lead to the growth of the organization.

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MICROFINANCE IN FINANCIAL INCLUSION

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ABSTRACT

Micro-finance refers to small savings, credit and insurance services extended to socially and economically disadvantaged segments of society. Indian context terms like "Small and Marginal Farmers", "Economically weaker sections "have been used to broadly define micro-finance customer. Large part of micro finance activities is confined to credit. It is effective intervention for the poverty alleviation. It therefore, holds promise to further the agenda of financial inclusion as it seeks to reach out to the excluded category of population fro banking system. Financial Inclusion (FI) is enabling access to/delivery of banking services at an affordable cost to the vast sections of disadvantaged and low-income groups. Unrestrained access to public goods and services is the sine qua non of public policy of a nation. As banking services are in the nature of public service, provision of banking and payment services to the entire population without discrimination should be the prime objective of the public policy. Large size and population of around 1000 million, India's GDP ranks among top 15 economies of world.Around300 million people or about 60 million households are living below the poverty line. Group of micro finance practitioners estimated the annualize credit usages of all poor families about Rs45000crores of which some 80 percent is met by informal sources. Credit on reasonable terms to poor can bring a significant reduction in poverty. About 60 million households below or just above the austerely defined poverty line and with more than 80 percent unable to access credit at reasonable rate. There are certain roles of microfinance in the development of economy. Microfinance institution are engaged in deposit taking in order to mobilize household saving, they became financial intermediaries. Consequently financial regulations become necessary to ensure the solvency and financial soundness of institution and to protect the depositors. Excessive regulations that do not consider the nature of microfinance institution and their operation can hamper their viability. Micro finance institution have expanded frontiers of institutional finance and have brought the poor, especially poor women into formal finance system and enabled them to access credit and fight poverty. Some significant strides have made in upscalling the large quantities of microfinance, observed that microfinance had an asymmetric growth across country with diverse rate of interest being charge to member which are area of concern. There are some agencies which provide bulk funds to system through NGO. Organization engaged in micro finance activities in India may be categorized as wholesaler, NGOs supporting SHG and NGOs directly retailing credit borrowers or group of borrower. Wholesalers will includes agencies like NABARD, Rashtriya Mahila Kosh, New Delhi and Women's world Banking,ASA in Trichy, RDO Layalam Bank in Manipur. There are some agencies which provide bulk funds to system through NGO. Organization engaged in micro finance activities in India may be categorized as wholesaler, NGOs supporting SHG and NGOs directly retailing credit borrowers or group of borrower. Wholesalers will includes agencies like NABARD, Rashtriya Mahila Kosh, New Delhi and Women's world Banking,ASA in Trichy, RDO Layalam Bank in Manipur. Microfinance can contribute to solving the problem of inadequate housing and urban service as an integral part of poverty alleviation programs. Microfinance institutions have a lot of contribution to this by building financial discipline and educating borrowers about repayment requirements.

KEYWORDS
Microfinance, Credit, Banking.

INTRODUCTION

Micro-Finance is emerging as a powerful tool, reaching to poor household yet to reach by Formal Financial sector. It is effective intervention for the poverty alleviation. It therefore, holds promise to further the agenda of financial inclusion as it seeks to reach out to the excluded category of population fro banking system.Financial inclusion (FI) is access the service at an affordable cost ton the vast section of low-income groups.

FIG. 1
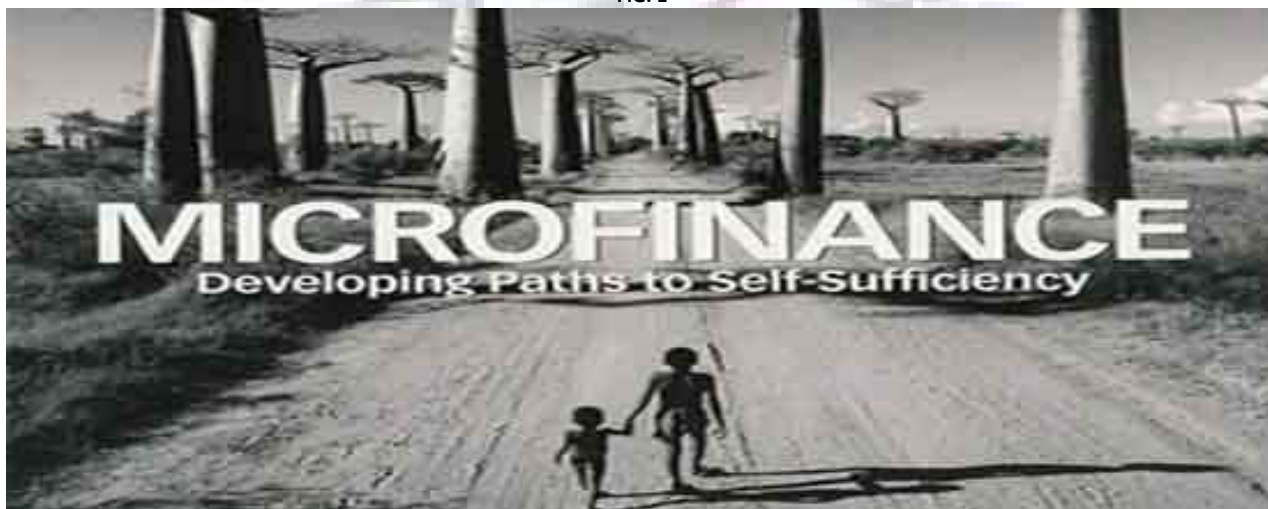
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Micro-finance refers to small savings, credit and insurance services extended to socially and economically disadvantaged segments of society. Indian context terms like "Small and Marginal Farmers", economically weaker sections have been used to broadly define micro-finance customer. Large part of micro finance activities is confined to credit.

Microfinance also refers to small scale financial services such as micro-saving, micro credit and micro-insurance to the people who operate micro enterprises which generate income and allowing them to meet financial needs and emergency. These short term loans are enough to start or expand business, weaving baskets, raising chicken or buying wholesale product to sell in the market. The aspect of microfinance has contributed to its success of its credit plus approach where focus has not only been on providing adequate timely credit to low income groups but to integrate it with other development activities such as community organizing and development, leadership, training, skill and entrepreneurship. The ultimate aim is to attain social and economic empowerment. The microfinance program has major impact on improving living standard of poor people.

The institutions, united under the banner of "microfinance", share a commitment to serving clients that have been excluded from the formal banking sector (ibid). According to National Sample Survey Organization's (NSSO), 59th Round (2003), only 48.6 per cent of the total number of cultivator households received credit from both formal and informal sources (financial inclusion in a broader sense) and remaining 51.4 per cent did not receive any credit (total financial exclusion). In the same survey it is further revealed that 22 per cent of the cultivator households received credit from informal sources (financial inclusion in narrow sense). Only 27.6 per cent of the farmer households has availed credit from the formal institutions like banks, cooperatives and government (Jeromi, 2006). Further, a Rural Finance Access Survey 2003, conducted by the World Bank and NCAER, revealed that 79 per cent of the rural households have no access to credit from formal sources (Basu, 2005). Hence, the tasks of microfinance are the promotion of greater financial inclusion2 and in the process improve the social and economic welfare of the poor.

Large size and population of around 1000 million, India's GDP ranks among top 15 economies of world.Around300 million people or about 60 million households are living below the poverty line. Group of micro finance practitioners estimated the annualize credit usages of all poor families about Rs45000crores of which some 80 percent is met by informal sources. Credit on reasonable terms to poor can bring a significant reduction in poverty. About 60 million households below or just above the austerely defined poverty line and with more than 80 percent unable to access credit at reasonable rate. The micro credit summit campaign reports that 14.2 millions of the world's poorest women now have to access to financial services accounting for nearly 74 per cent of the 19.3 million poorest served women. There are certain roles of micro-finance in economic development.

MFI's DIFFERENT MODES

Microfinance sector has covered a long journey from micro savings to micro credit and then to micro enterprises and now entered the field of micro insurance, micro remittance, micro pension and micro livelihood.

Micro-savings: These are deposit services that allow one to save small amounts of money for future use. Often without minimum balance requirements, these savings accounts allow households to save in order to meet unexpected expenses and plan for future expenses.

Micro credit: Micro credit is the extension of micro loans to the unemployed, to poor entrepreneurs and to others living in poverty that is not considered bankable. Micro credit can be offered, often without collateral, to an individual or through group lending. Region Rural Banks was created to take the banking services to poor people. They focus on credit rare than savings & insurance. RBI in its Annual Policy Statement for the year 2005-06.RBI has introduced the basic banking *'no frills'* account either with nil or very minimum balances as well as that would make such accounts accessible to vast section of population. General Purpose Credit Card (GCC) facility is issued by bank without insistence on collateral, with a revolving credit limit up to Rs25, 000 based on cash flow of household. RBI has set up Special Committee to advanced financial inclusion.

Micro-insurance: It is a system by which people, businesses and other organizations make a payment to share risk. Micro insurance products are mainly targeted at low income groups in the unorganized sector-farmers and craftsmen. The amount of premium in these schemes ranges Rs.200 to Rs.500. the finance ministry recently considered two schemes- _Aam Admi Bima yojna' to extend death and disability insurance and _Rashtriya Swasthya Bima Yojna', a health insurance scheme for below poverty line families .

MICRO FINANCE AND DEVELOPMENT GOALS

The implementation of Micro finance can make an important contribution to achieve the development goals such as **Poverty alleviation** – by borrowing, saving in insurance, the poor can build & diversify income sources, reduce the vulnerability by investing in assets. By using microfinance to invest in business opportunity the poor can have more stable income flows, reduce the poverty. **Primary Education** – house access to microfinance are sending their children to school. Improvement in income and better access to credit & saving can reduce the need to rely the child labors. **Women empowerment** - It helps to build the self-confidence, resulting in great decision making power, control over assets & mobility with broader community. **Environmental stability** – Microfinance helps to promote environmentally sustainable business and household practices. The considerable amount of microfinance provided for agriculture purpose, there is scope for financial service providers to take a lead in advocating environmentally sustainable practices.

GROWTH OF MICROFINANCE IN INDIA

During the financial year 2007-2008, microfinance in India through its two major channels-SHG-linkage-bank and MFI served over 33 millions India up by 9 million over the previous financial year and 4 out of 5 microfinance clients in India are women.

TABLE 1

Particulars	2002	2003	2004	2005	2006	2007	2008
No of new SHG provided with Bank Loan	461478	717360	1079091	1618456	2238565	2924973	3477965
No of new SHG Financed during the year	197653	255882	361731	539365	620109	686408	552992
Rate of growth of loan to new SHG(%)	32	29	41	49	15	11	(-16)
No of SHG Receiving repeat loans	41413	102391	171669	258092	344502	457410	186883
Rate of growth of repeat loan	91	147	68	50	33	33	Incomplete
Proposition of repeat loans to total loan	17	29	40	32	36	40	11
Bank loan disburse during year(cr)	545	1023	1855	2994	4499	6643	4228
Bank loan disburse to new groups(cr)	453	691	4458	1727	2330	3044	2542
Bank loan disbursed as repeat loan(cr)	92	332	693	1268	2169	3599	1686
Average loan size new	22919	27005	32013	32019	37574	44343	45960
Repeat loan size	22215	32425	40660	49130	62960	78682	90195

The table shows the growth of MFI in India. The MFI draws mostly capital from the private banks, SIDBI and foreign investors. The number groups that have borrowed from bank increase to 3.48millio and extent of finance availed is increased to 42.28billion.

FORMAL AND INFORMAL SECTORS IN INDIA

FORMAL SECTORS

The formal sector banking institution in India have been serving only the needs of commercial sector and providing loans for middle and upper income groups. For housing the HFIs primarily perceived risk of lending to this sector. Risks generally perceived by formal sector, Financial Institutions are credit risk, High transaction and services cost, Irregular flow of income due to seasonality, Lack of tangible proof of assessment of income, Absence of land tenure of financing

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housing. Formal Financial Institutions are concerned are Commercial Banks, Housing Finance Institution(HFI),NABARD, Rural Development Banks(RDB),Land Development Banks and Cooperative Banks(CBs).

The government has taken several initiatives to strengthen the institution rural credit system. The rural branch network of commercial banks have been expanded and certain policy prescriptions imposed, in order to ensure great flow of credit to agriculture and other preferred sectors. The commercial banks are required to ensure that 40% of total credit is provided to priority sectors out of which 18% in the form of direct finance to agriculture and 25% to priority sector in favor of weaker sections besides maintaining a credit deposit ratio of 60% in rural and semi urban branches. Further IRDP introduction in 1979 ensure supply of credit and subsidies to weaker section beneficiaries.

INFORMAL SECTORS

Informal sectors generally include funds available from family sources or local money lender. Local money lenders charge exorbitant rates, generally ranging from 36% to 60% interest due to their monopoly in the absences of any other source of credit for non-conventional needs.

NGOs engaged in activities related to community mobilization for their socio-economic development have initiated saving and credit program for their target groups. Community based financial system (CBFS) can be categorized into two models. Group base financial intermediary and NGO linked financial intermediary.NGOs like SHARAN in Delhi, FEDERATION of THRIFT AND CREDIT ASSOCIATION (FICA) or SPARC have adopted first model where they initiate groups and provide necessary management support.SEWA pertain to second model.

Experience of these informal intermediaries shows that although saving of group members, small in nature do not attract high returns, it is skill practiced due to security reasons. Most of loans are unsecured. Personal or group guarantees or other collaterals like jewellery is offered as security. There are some agencies which provide bulk funds to system through NGO. Organization engaged in micro finance activities in India may be categorized as wholesaler, NGOs supporting SHG and NGOs directly retailing credit borrowers or group of borrower. Wholesalers will includes agencies like NABARD, Rashtriya Mahila Kosh, New Delhi and Women's world Banking,ASA in Trichy, RDO Layalam Bank in Manipur.

PROGRAMMES TARGETED AT LOW INCOME GROUPS

GRAMEEN BANK IN BANGLADESH

Grameen Bank lending system is simple but effective. To obtain loans, potential borrowers must form a group of five; gather once a week for loan repayment meetings and to start with learn the bond rules and "16 Decision", which they chant at start of their weekly session.There decision incorporate code of conduct that members are encourage to follow in their daily life, e.g.: production of fruits and vegetables in kitchen gardens, investment of improvement of housing and education for children, safe drinking water for health,etc.For this physical training are held at meeting.Key-unit in credit program is first necessary step to receive credit. Initially loans are providing to individuals in group, there were under pressure from other members to repay the loan. Credibility of group members and benefits in term of new loan will be stopped if any one default to repay and the group members are fined or expelled a member if they fail to attend the meeting.

FINANCIAL MODEL FOR SELF-HELP GROUPS

SHG-MGI SYSTEM

Typical SHG consist of 12 or 30 member. It is not only saving and loan association but serves as "affinity" group that provides platform for issues. SHG is system raises funds from individual and also from MCI. MCI arise fund from three sources: Capital, SHG saving and borrowing from outside and MCI have regulatory restriction on assets, liabilities and interest rates.

Some of the principles underlying that were issued to implementing:

- SHG use almost 60% for lending to their members and rest for depositing.
- Joint liability of members is to serves as substitute for physical collateral and saving are to come first.
- Interest rates on saving and credit for members are market rates to determine locally by participating institutions.
- All NGOs and SHGs will charge an interest margin to cover their costs.
- SHGs may levy an extra charge to interest rate of internal fund generation which will force saving.

CHALLENGES OF MICROFINANCE

The importance of microfinance in the process of poverty eradication is realized, it faces multiple problems. Offering financial services to poor individual and in it leads to various challenges. Challenges are divided as

CHALLENGES TO MICRO ENTREPRENEURS

1. Inability to offer marketable collateral for loans - They are either small businesses or poor individual who have few assets and low income. These clients have cannot offer any collateral for loans. Due to this microfinance providers may raise their interest rate or turn down hundreds of application.
2. Poor institutional viability of micro enterprises - Business ideas with a lack of consideration of demand and cost render the micro venture unsustainable and microfinance may incorrectly get blame for it. For instance, In the case of micro crop farming farmer often fail to account for their personal consumption between the sowing and harvesting periods and realize they face shortage of more. Due to this they often end up using the micro loan for personal matter and problem arises when its time to pay back the loan, farmer are forced to take another loan.
3. Knowledge regarding sources of microfinance is lack - Many micro entrepreneurs live in remote villages, so they have no access to microfinance service offered by MFIs.
4. Misallocation or shortage of finance - Lack of fund, which can solve if MFIs build up their capital base by accessing various sources of funds without fund micro ventures, cannot grow.
5. Inability to exploit growth opportunities - Shortage of finance is a contributor to this problem, because lack of access to funds means micro entrepreneurs cannot inject money into their business to grow. They may have little information pertaining to their market such as customer needs and competitor strengths and weakness, this may result May critics.
6. Lack of organizational resources and governance - They may have limited skill, qualification and exposure to handling business. They need to be trained through capacity building initiative by MFIs; many micro entrepreneurs may not grow because of this problem.
7. Low bargaining power - Micro entrepreneurs operates in competitive markets, their individual bargaining power is diminished. There still isn't any respite because micro entrepreneurs deal with MFIs on individual basis, which also erode their bargaining power.

Most problems faced by micro entrepreneurs are caused by small size, improper skill, and location. When venture secures loan and begins to grow these problems will eventually.

CHALLENGES TO MICROFINANCE PROVIDERS

The importance of microfinance in the process of process of poverty eradication is realized, it faces multiple problems. The challenges to microfinance providers are

1. High risk of micro entrepreneurship and small business - Micro entrepreneur usually no collateral to offer microfinance providers, no alternate source of income. Micro entrepreneurs are considered high risk ventures and micro finance providers are forced to compensate for this by changing interest rate.
2. High costs for Micro Lending - Small micro enterprises increase the transaction cost for MFIs, because they cannot process micro loan in bulk. In study conducted by Asian Development Bank, Microfinance providers change interest rate ranging from 30 to 70% per year.
3. Fund shortage - There are plenty of financial options available for MFIs there is an emerging shortage of money. This is due to lack of awareness of funding source by MFI managers.

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4. Difficulty in measuring the social performance of MFIs - Micro finance is delivering the economic returns its proponents promised but there are only a handful of tools available that measure the social return of microfinance.
5. Mixing of charity with business - If microfinance providers fail to protect themselves against loan delinquency, they will in effect, prioritize social at expenses of financial sustainability. Improper delinquency management is result of inadequate implementation of corporate governance principle. As result loses control over microfinance deals will lead to higher default rates.
6. Lack of solution for poor - Targeting of poor households by microfinance programs is common problem because MFIs fail to understand the various needs of micro entrepreneurs. MFI must spend time to develop microfinance tools for each micro entrepreneur.
7. Lack of microfinance training for MFIs - Micro finance sector is different when compare to traditional financial sector, microfinance providers need special training to ensure they avoid problem such as under-serving clients.
8. Poor distribution system of MFIs and lack of information about microfinance investment opportunities.

CHALLENGES TO WOMEN

Micro-finance has been successful in supplying production loans to women; these initiatives may produce negative results

1. The workload may lead to poor health, exhaustion and overwork.
2. The problem of male influence is one of the most difficult challenges related with women as micro-finance clients.
3. They turn the money to their husband, rather than using for business and Even after the disbursement of loan they don't know how to use it.
4. The domestic responsibilities of women consume major portion of time and spend on this enterprise.

CONCLUSION

All these problems can broadly fall into either financial or operational in nature, they should not be impossible to solve as microfinance sector move towards its optimal performance level in next several years. Microfinance can contribute to solving the problem of inadequate housing and urban service as an integral part of poverty alleviation programs. Microfinance institutions have a lot of contribution to this by building financial discipline and educating borrowers about repayment requirements. Micro Finance have more opportunity if the state Reduced direct involvement, increased outlays, Structuring of outlays and finding right outlets, Creating incentives and regulatory environment for implementation. The micro-finance also proved it to the success of women empowerment. In the recent years micro-finance programs have confined themselves to distribution of loan to women, but the receipt of loan and utilization of loan helps in improving the economic status of women. The bank would have to evolve specific strategy to expand the outreach of their services in order to promote the financial inclusion. One of the way in which this can be achieve in cost-effective manner is through forging linkage with microfinance institution and local communities. Financial inclusion can emerge as commercial profitable business in future.

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A SURVEY OF STATISTICAL DISTRIBUTION OF JOURNAL IMPACT FACTORS

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ABSTRACT

In this survey, statistical distributions of journal impact factors (JIF) are discussed in brief as given by several authors since the beginning and the development of JIF from Gross and Gross (1927) to Garfield (2006) and more is discussed. Several authors discussed varied statistical distributions and no uniqueness solution is emerged in their distributions.

KEYWORDS

Impact Factor, Journal Citation Report, Statistical Distributions.

INTRODUCTION

eglen (1997) found that evaluating scientific quality is a disreputably difficult problem and having no standard solution. True experts in the field should examine the published scientific results according to established rules for the assured quality. In practice, however, the tradition of peer review system is usually in vogue by committee formed with general competence rather than with the specialist's insight. Committees lean, therefore, to resort to secondary criteria like crude publication counts, journal prestige, the reputation of authors and institutions and estimated importance and relevance of the research field.

Mishra (2010 a) found that University Grants Commission of India notified on 23rd September 2009 about its regulation on 'Minimum Qualifications for Appointment of Teachers and other Academic Staff in Universities and Colleges and Measures for the maintenance of standards in higher education'. Accordingly, publication of research papers/articles in reputed journals has become an important factor in assessment of the academic performance of teachers in Universities and Colleges in India. One of the measures of reputation and academic standard of a journal is the so-called JIF. JIF is the ratio of the total number of citations received by papers published in the journal minus self citations to the total number of papers published in the journal in previous two years and it is discovered by Eugene Garfield, the founder of the Institute for Scientific Information (ISI), in 2006 and ISI is now part of Thomson Reuters. Impact of a journal should not be confused with impact of an article or author; even something as small as a title change affects the impact factor (Garfield, 1994).

JIF are based on two aspects, namely, on the number of publications of a journal and the number of citations those publications received. In short, publications are marks of a journal's effort or activity whereas citations are a mark of a journal's effect or impact. In academia, most of the readers are writers as well. When authors do not cite correctly or when they do read, but do not write (and hence do not cite), journal impact indicators have a serious problem. Stock (2009) found that there are discipline-specific citation behaviours. Therefore, it is not possible to compare JIF across disciplinary borders.

Many authors such as Dube (1966, 1970), Brookes (1970), Tadikamalla (1980), Brown (1980), Sichel (1985), Matricciani (1991), Budd (1992), Egghe and Rao (1992), Hurt and Budd (1992), Rousseau (1993), Burrell (2005), Glanzel (2006), Bensman (2008), Egghe (2009), Mishra (2010 b & c) and others derived statistical distribution of JIF of their own. No uniformity or generality is emerged in their findings. Each has given different finding. One of the reasons seems to be the use of different data (kinds and qualities of papers and time periods) used in their findings. Their findings are based on empirical works only and no solid theory and statistical test are derived for statistical distributions.

DEVELOPMENT OF JIF

Archmbault and Larivieri (2009) found origin and development about JIF in US University and college librarians who wanted to use an objective method to select journals for their holdings. This gave an important consideration about the method allowed for the identification of high impact journals in scientific fields and a method was then developed to determine the journal impact measures based on self-citations. It was then decided to use two-year citation window. This method was firstly developed by Gross and Gross (1927) after compilation of a list of relevant journals using subjective approach. The use of journal impact (JI) calculation has emerged as journal citation report (JCR) from Thompson scientific work. It was developed specially to cater the needs of US librarians. International Statistical Institute scaled up the emergence and evolution of this method in 1970s by creating a self fulfilling prophecy and has continued for 30 years to publish the JCR. By creating a centre stage, the measures of JIF made a selective promotion for US journals, which could then be picked up, read and increasingly cited by researchers. They found that this practice produced adverse effects when measures of JI were used to evaluate scientific production across fields. Gregory (1937) produced a colossal study using the Gross and Gross method to identify key journals in 27 fields relevant to medicine. Brown (1956) published a monograph entitled 'Scientific Serials' on collecting citations from several journals and covering eight fields of science. Fuyuno and Cyranosky (2006) revealed few examples on cash earning on 'impact game' played for the publications.

Garfield (2006) found that the idea of an impact factor in science was mentioned in 1955 when the experimental genetic citation index was published with support from the National Institutes of Health. Irving H. Sher and Eugene Garfield created JIF to help select additional source of journals. Credit is to be given to Eugene Garfield for the development of computational formula of JIF. Epstein (2007) and Brumback (2009) also mentioned about the 'impact game' to be played in number of ways. The debate over whether to include journal self citations is as old as the methods to measure the journal impact. Althouse et al. (2008) found that E. Garfield published his 1972 paper in science describing the role of impact factor in bibliometric studies; he provided the table of the highest-impact journals in science based on 1969 data. Gross and Gross (1927), Epstein (2007), Brumback (2009) and many authors mentioned to exclude those citations, if any. Garfield (2006) adopted Martyn's and Gilchrest's concepts and gave the computational formula of JIF as

$$\text{JIF in t +1 year} = \frac{A}{B} \qquad (1)$$

where   A = No. of Citations a Journal Receives in t and t - 1 years
         B = No. of Articles Published in t and t - 1 years

A natural generalization of Garfield's impact factors (IF) is obtained by considering IF over different time periods (Rousseau 1988) as

$$IF(n) = \frac{\sum\limits_{k=1}^{n} c(k)}{\sum\limits_{k=1}^{n} p(k)} \qquad k = 1, 2, 3, \ldots, n \qquad (2)$$

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For k = 2, i.e., IF(2) is actually Garfield's JIF. (2) is the generalized form of (1) and (1) is a particular case of (2) when k = 2.

Alternative method such as citation rates (CR) of scientific journals by the Institute for Scientific Information was also popular and CR is also known as the JIF by that time which is calculated as the mean CR of all articles contained in the journal. This is published annually and is widely regarded as a quality ranking for journals. The results are published as the 'Science Citation Index (SCI)'. On the basis of SCI and authors' publication lists, the annual citation rate of papers by a scientific author or research group is thus calculated. Citation habits and citation dynamics vary from person to person and also from research fields as to make evaluative comparisons. The citation impact of a research field is directly proportional to the mean number of references per article, which varies considerably from field to field. Garfield (2006) concluded that 'C. Hoeffel expressed JIF is not a perfect tool to measure the quality of articles but there is nothing better and it has advantage of already being in existence and is, therefore, a good technique of scientific evaluation'.

The h-index, the most popular of statistics mentioned here, was proposed by J. E. Hirsch (Hirsch 2006) in order to measure the scientific output of a researcher by focusing on the high-end tail of a person's citation distribution. Substituting a single number for publications counts and citation counts was its goal. The h-index provides a combination of both quantity (number of papers) and quality (impact, or citations to these papers) (Glanzel 2006). The m-index, proposed by J. E. Hirsch (Hirsch 2006), is the h-index divided by the number of years since person's first paper. Intension is to compensate junior scientists because they have not had time to publish papers or gain many citations. The g-index, proposed by L. Egghe (Egghe 2006), is the largest n for which the n most cited papers have a total of at least n citations. Hirsch's h-index does not take into account the fact that some papers in the top n may have extraordinary high citation counts. The purpose of g-index is to compensate for this. Hirsch also claims that one can use the h-index to compare two scientists. But neither of these assertions is supported by convincing evidence. Ogden and Bartley (2008) found that JIF speak something about a journal's citation performance and their shortcomings. They discussed seven types of shortcomings and one of the seven shortcomings is about completely misrepresent of total current citation rate for the journal in two cited years.

Glanzel (2010) found rapid growth in the citation analysis, especially journal metrics, over the last decade. The most notable developments include – relative citation rate, the h-index, article influence, sclmago journal rank and source-normalized impact per paper. In most fields, research results are communicated via papers scholarly journals, although conference proceedings, books and patents may also play a role. These publications cite earlier research the authors have found useful or wish to respond to in some way and, in turn, attract citations from researchers who find their work worth citing. He then discussed that between two journals A and B, IF of A is twice that of A. Does this mean that each paper from A is invariably cited more frequently than any paper from B?

The h-index is one of the most successful metrics and it was originally created to compare individual researchers. It is the number of papers by a particular author that receives h or more citations. The h-index has proved highly popular; it too suffers from some of the same issues as the IF such as bias and misuse.

STATISTICAL DISTRIBUTIONS

As we know, citation statistics are used in ranking papers, people and programmes and no specific model is specified. Model suggested by the data is used and it is often vague. Citation data behave differently and in this situation no unique statistical distribution is suggested to be used. Several authors suggested using different distributions based on their empirical results. Some of them are described as. Merton (1968, p.58) discussed that "the Matthew effect consists in the accruing of greater increments of recognition for particular scientific contributions to scientists of considerably repute and the withholding of such recognition from scientists who have not yet made their mark". He then coined the term Matthew effect which means that often-cited papers get cited more often and influential authors gain more influence. Irwin (1975) found the general waring (GW) distribution is a hypergeometric distribution based on empirical study and he discussed some of its properties in which its first four moments are finite. Latter he explored the long-tailed GW distribution. Certain negative Binomial distribution is limiting form of the GW distribution under finite case. The simple waring distribution was fitted by maximum likelihood to the observed distribution of the number of filarial worms on 2600 mites without computation of standard errors of GW distribution. He then gave Newbold's accident distribution (Newbold 1927) in which GW distribution was fitted and showed some improvement on Newbold's negative Binomial distribution. The continuous analogue of the GW distribution is then obtained and it is in general of Pearson's type VI and the successive moments of the GW distribution and the corresponding type VI become infinite for the same value of ρ. The continuous analogue takes the type V form when both parameter values tend to infinity. The analysis used by him classifies all Pearson's types according to the values of parameters of hypergeometric form which they are derived. Ijiri and Simon (1974) derived from Pareto distribution designing an empirical test and used a mathematical model. Tol (2009) then estimated the coefficients using the method of ordinary least squares and concluded that top papers are cited more often than one would one would expect on the basis of their rank, provided famous paper attract more citation. Tadikamalla (1980) found a comprehensive idea about the Burr (types II. III and XII) and the related distributions such as Logmax, exponential gamma (Dube 1966, 1970), compound Weibull, Weibull, logistic, log-logistic and 2p-kappa family of distributions and concludes that Burr type III and type XII distributions can be used to fit almost in any unimodal data and are comparable to the Pearson and the Johnson system of distributions. Egghe (1988) discussed for a general relationship between the impact factor and the average number of citations per year. Matricciani (1991) and Egghe and Rao (1992) have shown that citation curves are best described through lognormal distribution. Hurt and Budd (1992) have argued in favour of Weibull distribution. Rousseau (1993) applied Weibull and lognormal distributions and obtained t^m to reach maximum of average number of citations, where t^m denotes time period for becoming maximum journal impact factor. Further, if number of publications varies widely from year to year nothing much can be said about the impact factor. Borokhovich et al. (2000) first examined the determinants of social science citation index (SSCI) impact factors for three finance journals and concluded based on empirical study that use of the SSCI impact factor as a means of identifying the most influence journals in finance appears to be justified. Their results also show that impact factors are good indicators of long-term influence. Burrell (2005) found that for many purposes, the distribution is best motivated via a familiar informetric scenario of a population of sources producing items over time leading to a stochastic process from which the univariate, bivariate and multivariate forms of the GW distribution are natural consequences. Three-parameter family named the GW distribution was given a ready interpretation in the modelling of accident data. Glanzel (2006) attempted to interpret theoretically some properties of the h-index, giving the underlying citation distribution, on the basis of extreme-value statistics. Specifically, the dependence of the h-index on the basic parameters of the distribution and on the sample size was discussed using Gumbel's characteristic extreme values. Greenwood (2007) used Bayesian Markov chain Monte Carlo methods to estimate the uncertainty associated with journal performance indicators on citations to journals in research and experimental medicine in 2005. He then found that only the top and bottom few journals could place any confidence in their rank position. Intervals were wider and overlapping for most journals. Bensman (2008) examine probability structure by analyzing the distributions of 2005 JIF for science and social science journals. The Science journals behaved as negative Binomial distribution whereas social science journals fit Poisson distribution model. Both IF distributions were positively skewed – the SCI much more than the social science – indicating excess variance. Tol (2009) found that famous papers by famous authors are cited most. This implies that there are 'increasing returns to scale' in influence, and that Merton's (1968) Matthew effect is real and can be found in data believing that recognized authors gain more recognition as Merton argued. However, the Matthew effect as defined and measured here implies that the relationship between citation numbers and quality is different at the top end of the distribution than at the bottom end. Mishra (2010 b) found that Burr-XII, Dagum or Johnson SU distribution are the best fit to logarithmic of JIF using data on JIF of the major discipline groups (such as Chemistry, Statistics, Psychology, Economics, Engineering, Physics, Biology and Social Sciences) for 2006 and found statistical distribution of JIF is characteristically asymmetric and non-mesokurtick. Even the distribution of $\log^{10}$ (JIF) exhibits conspicuous and non-mesokurticity. He then concluded that Johnson SU distribution is the best choice to fit the $\log^{10}$ (JIF) data. The distribution of $\log^{10}$ (JIF) has become more skewed and leptokurtic, possibly suggesting the Matthew effect in operation, which means that more cited journals, are cited even more over time. Mishra (2010 c) studied the over-the-sample stability of the estimated parameters of statistical distributions of JIF data of 2008. His findings are based on empirical work and he concluded that Johnson SU distribution exhibits the stability for logarithmic of JIF-2008 data which will be the best fit here and forecasts the same to be in other years too. Pan and Hong (2011) briefly analyzed the 2009 publication status based on empirical findings only and concluded that there is a significant increase in number of scientific papers related to a specific area as dental due to more care taken by government.

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CONCLUDING REMARKS

The model suggested by the data is in general use and it is often vague. Behaviour of citation data shows differently and no unique statistical distribution is recommended for the use by the authors. IF is not a perfect tool to measure the quality of articles but there is nothing better and it has the advantage of already being in existence and is, therefore, a good technique for scientific evaluation. It is most difficult to have an article accepted in each of the best journals which have a high IF. h-index and g-index are alternative measures of journal impacts which are two relatively new citation metrics.

All JIF are not comparable as Stock (2009) concluded that JIF across disciplinary borders are not possible to compare. The best course of action therefore seems to be redesigning the tool from the ground up. Statistical distributions by some authors are based on JIF while others are based on functions of JIF such as $\log^{10}$ (JIF), etc across disciplinary borders. None has used the same data on JIF in deriving the statistical distribution. I agree with Rousseau (1988) who concluded that more research is needed to find the exact distribution for all types of citation curves. Giving credit to Eugene Garfield for the discovery of computational formula of JIF is not only appropriate but also legitimate.

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A STUDY ON STRUTURE AND GROWTH OF STEEL INDUSTRY IN INDIA

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ABSTRACT

The back bone of any economy is its industries. It is the industrial growth of a country that contributes to the faster growth of the economy. This realization has made the economic planners and practioners to implement various policies and programmes that are highly favorable for the development of industries. In the context of India, there are a few traditional industries which contribute to the faster industrial development and the steel industry is one. The Indian steel industry occupies the fifth place in the manufacturing of steel globally and hence it attracted the policy makers very much. With effect from 24-5-92 iron and steel industry was included in the list of 'high priority' industries for automatic approval for foreign equity investment up to 51 per cent (now 74 per cent). The import regime for iron and steel has undergone major liberalization moving gradually from a controlled import by way of import licensing, foreign exchange release, canalization and high import tariffs; to total freeing of iron and steel imports from licensing, canalization and lowering of import duty levels. Export of iron and steel items was also freely allowed. The government framed and implemented National Steel Policy in 2005. The long term strategic goal of NSP is that India should have a modern and efficiency steel industry of world standards, catering to diversified steel demand. Steel production has increased in accordance with the global production. In terms of value, at the aggregate level, the production of steel marked a compound growth rate of 7.788 per cent. The growth of capital in Indian steel industry was also estimated and found that the CGR was 4.081 for the entire industry where as it was 1.511 per cent and 4.289 per cent for the small and large firms respectively. There was a decline in the growth of employment while the average growth of global steel production was 5.195 per cent, steel production in India increased at an average rate of 8.162 per cent. Similarly, the share of India in the global steel production also increased from 2.925 per cent in 1997-98 to 3.970 per cent in 2006-07. A general conclusion that could be made from the analysis is that, in all the measures, there was a significant improvement in the Indian steel industry. The small firms may have certain advantages like lower wage rate, but the large firms, due to the benefits of scale of production, could perform much better than the small firms in the Indian steel industry during the period 1997-98 to 2006-07.

KEYWORDS
Import tariffs, Canalization, Foreign equity investment.

INTRODUCTION

The steel industry is one of the most energy intensive and highly technology intensive sector within the Indian economy. The progress of steel industry has a critical influence on the pace of development of India and as such great importance is attached to the production and capacity expansion in line with the expected demand at cost and prices making Indian steel internationally competitive. The present chapter specially deals with the policy measures initiated by the Government with the view to make this sector more productive and competitive.

OBJECTIVES OF THE STUDY
- ❖ To understand the structure of the large, medium and small scale industries of India.
- ❖ To estimate the growth of the Indian steel industry.
- ❖ To provide suggestions based on the issues identified.

SOURCE OF DATA

From the official sources it is found that there are totally 279 steel industries with a distribution of 48 large and 231 medium and small scale industries are getting operated in India. However, for the purpose of collecting a reliable secondary data, the researcher could identify that there are only 15 large scale industries and 19 medium and small scale industries listed in Bombay Stock Exchange and National Stock Exchange. Hence, the study is confined to these 15 large scale and 19 medium and small scale industries.

The required secondary data were collected from Capital line Database and the Annual Reports of BSE, the Annual Reports of Steel, Ministry of Steel, the annual Reports of 'Corporate Sector', 'Capital Markets' and 'Market Shares and Size of Industrial Product' published by Centre for Monitoring Indian Economy (CMIE), Annual Survey of Industries, published by Ministry of Industries, Economic survey and the Annual Reports of respective industries under study. The secondary data pertaining to the level of output of the selected firms, number of labours employed, investment made, exports, imports, the data on financial indicators were collected.

REVIEW OF LITERATURE

Majumdar[1] studied the pattern of productivity growth of Indian Industrial sector since 1950s. The study empirically proved the positive impact of liberalisation measures on productivity. The reforms process was not exacerbated entry threats for the sitting incumbents in Indian industry, but the environment was equally competitive for the new entrants. Attainment of efficiency was a key survival criterion in such situations and the Indian firms had so far yielded positive efficiency out comes. The adoption of technological and organisational innovations had a very large impact on productivity at the firm level. The policy changes that took place in India in the 1990s did significantly enhance potential opportunities on one hand and increase the uncertainties and ambiguities levels on the other.

Romer[2] suggested that the technological change has been an important factor to contribute output growth. Technological change arises in large part because of intentional actions taken by people who respond to market incentives and hence the technical change happens more to be endogenous rather than exogenous. In his study, he concluded that the stock of human capital (levels of education and experience) accelerated the growth but the growth did not depend on total size of labour force or the population. He found that international trade facilitates free flow of new ideas and technologies and reduces the idea-gap, which was a major source of spillovers and growth. Most of the new ideas and technologies were developed in developed countries and trade with them helped in realising these dynamic gains to promote productivity. He further found that the use of non-rivalry nature (use of a blue print of a technology or new idea by one agent does not preclude use by other agents) of technological change was a source of increasing returns to scale and sustained long run growth.

Athreya and Kapur[3] studied the linkage between the policy towards foreign capital and its contribution to the Indian economy. They also explained the long run conduct and performance of foreign controlled firms relative to domestic firms. In 1950s, the Indian government, in order to achieve the plan targets, allowed foreign equity participation to meet the foreign exchange needs of investment projects. In 1960s, the selectivity of government policy changed the pattern of foreign capital towards manufacturing and technology intensive industries. In 1970s, the intervention of FERA to dilute the 40 per cent of foreign equity and the exception of 'technology intensive' export intensive and core sector, proved more hostile to new foreign investment than the existing foreign affiliates. In 1980s, the policies of India were softened to attract foreign investment but there was only a slight increase and most part, Indian industry came to rely on foreign debt capital to meet its foreign exchange needs. The enormous increase in FDI was realised only in 1990s when India agreed to implement the reform

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measures in tune with IMF. The study found that the advertising intensity was greater for foreign controlled firms while expenditure on technology imports was greater for domestic firms. Export intensity was quite similar for both the firms. Technology inflows could also improve the productivity of domestic firms through spillovers as better productions and management techniques in the host country.

Goldar and others[4] in their paper studied the effect of ownership on efficiency of engineering firms in India with a comparison of technical efficiency among three groups of firm's viz., firms with foreign ownership, domestically owned private sector firms and public sector firms. The study explained that the foreign ownership firms had greater efficiency than the domestic firms. It was so because, in a developing country, the foreign firms had relatively better access to advanced technology. The study concluded that the foreign firms in Indian engineering sector had greater technical efficiency than that of domestic firms and there was no significant variation in technical efficiency between private and public sector firms. The study pointed out a fact that there were indications of a process of efficiency convergence, that is, the domestic firms tended to 'catch-up' with foreign firms in terms of technical efficiency. Among the various factors responsible for inter firm variation in technical efficiency, the import intensity played a significant role. The liberalization of imports increased the access of firm to imported inputs and capital goods and thus contributed considerably to increase the efficiency of engineering firms.

Nwaokoro[5] examined the impact of the trade restrictions on steel imports in order to protect the US steel industry. During the period of 1963 to 1988, the industry experienced a tremendous decline in its output. Trade restrictions are implemented to limit steel imports. The overall goal of this study is to estimate the impact of the steel trade restriction regimes on the output of the industry. Beside foreign competition, the study addresses the impact of other factors - other shipments (nonsteel shipments) and the prices of steel substitutes - aluminium, and plastic and rubber that may have also caused variation in steel production. The study estimated insignificant regression results which implied that the protection regimes were not statistically significant to enhance output expansion.

- Equity intensives (retained cash flow from operations to tangible net worth)
- Return on investment (profit before depreciation, interest and tax to total tangible assets)
- Sales efficiency (profit after tax to net sales) and

Their study observed a declining trend in profitability in relation to sales shareholders equity and total investment the impact of which increased with the increasing interest burden. It was also found that these 3 groups of ratios of profitability showed a consistent declining trend across most of the firms.

INDIAN STEEL INDUSTRY: AN OVER VIEW OF POLICY MEASURES

The Indian iron and steel sector has been under strict government control for almost the whole period since independence. Government intervention took place in the form of both direct and indirect intervention. After independence in 1947, the government took full control over the iron and steel sector and established a policy of restricting development of new integrated steel plants to the public sector. The policy change was due to sustained shortage of steel in the Indian economy. Prices of different steel products were determined by the government and announced by the Joint Plant Committee (JPC), a body constituted in 1964 under the Iron and Steel Control Order. The distribution policy aimed at ensuring an equitable distribution among end- users and meeting the requirements of the priority sectors like Railways, Defence and Power. From 1972 onwards, due to impeded growth in the steel industry, the government introduced dual pricing in the iron and steel industry. In the new Industrial Policy announced in July 1991 Iron and Steel Industry, among others, was removed from the list of industries reserved for the public sector and also exempted from the provisions of compulsory licensing under the Industries (Development and Regulation) Act, 1951. The import regime for iron and steel has undergone major liberalization moving gradually from a controlled import by way of import licensing, foreign exchange release, canalization and high import tariffs; to total freeing of iron and steel imports from licensing, canalization and lowering of import duty levels. Export of iron and steel items was also freely allowed.

The government of India with a view to make the Indian steel globally competitive and more productivity further eased and intensified the reform process. The major initiative taken by the Government after 2004 include the merger, acquisition, revival and structuring of sick units. The government framed and implemented National Steel Policy in 2005. The long term strategic goal of NSP is that India should have a modern and efficient steel industry of world standards, catering to diversified steel demand. With these policy measures and effective monitoring mechanism, it is worthy to mention that the production of steel in India has greatly improved. The following section will present an empirical evidence of the structural growth in Indian steel industry during the period 1997-98 to 2006-07.

STEEL PRODUCTIONS IN INDIA: A COMPARISON WITH GLOBAL PRODUCTION

At the global level, an increasing trend in the steel production could be noticed in Table 4.1. In 1997-98, the initial period of study, the world production of steel was 799 million tonnes but declined marginally to 777 million tonnes in the year 1998-99. With the steady increase, the global

Production of steel was found at 1244 million tonnes in the year 2006-07, an increase of 445 million tonnes during the study period. The growth of global steel production was also subject to wider fluctuations varying from a negative growth of 2.753 per cent in 1998-99 to a positive growth of 10.206 per cent in 2004-05. The average growth of global steel production was estimated at 5.195 per cent for the period 1997-98 to 2006-07.

The share of India in the world production of steel improved significantly over the period of study. The percentage share of steel production in India in the global production is also presented in Table 4.1.India's share in global steel production was 2.925 per cent in 97-98.

It could be noticed from Table 4.1 that the share of India in the global steel production witnessed a steady increase from 2.925 per cent in 1997-98 to 3.970 per cent in 2006-07, an increase of over one per cent during this period. The share of India declined negligibly from 3.746 per cent in 2004-05 to 3.733 per cent, a marginal fall of 0.013 per cent in 2005-06. The average share of India in the global steel production was estimated at 3.539 per cent during the period 1997-98 to 2006-07.

Therefore, it could be inferred that the steel production in India increases in accordance with global production. While the growth of global steel production was in the range of -2.753 (1998-99 and 10.206 per cent (2004-05), the steel production in India recorded much higher and positive growth in the range of 1.926 per cent (1998-99) and 15.841 per cent (2006-07). Similarly the average growth of steel production in India was also found higher at 8.162 per cent as against 5.195 per cent recorded for the global production of steel. In the same way, there was continuous increase in the share of India in the global production of steel. By applying the trend analysis the steel production in India is estimated 65.338 million tonnes, for the year 2015-16. 1523.261 million Tonnes in the world during the same year.

TABLE: 4.1: TRENDS IN THE PRODUCTION OF STEEL INDUSTRY IN INDIA AND THE GLOBE: A COMPARISON (Million Tonnes)

Sl. No.	Year	India	Growth (%)	World	% Growth	% share in World Production
1.	1997-98	23.37	2.861	799	5.828	2.925
2.	1998-99	23.82	1.926	777	-2.753	3.066
3.	1999-00	26.71	12.133	789	1.544	3.385
4.	2000-01	29.70	11.194	848	7.478	3.502
5.	2001-02	30.63	3.131	850	0.236	3.604
6.	2002-03	33.67	9.925	904	6.353	3.725
7.	2003-04	36.19	7.484	970	7.301	3.731
8.	2004-05	40.05	10.666	1,069	10.206	3.746
9.	2005-06	42.64	6.457	1,142	6.829	3.733
10.	2006-07	49.39	15.841	1,244	8.932	3.970
	Mean	33.617	8.162	939.200	5.195	3.539
	CV	25.301	56.143	17.310	79.680	9.270

Source: Annual Reports, Ministry of Steel, GOI, various issues and World Steel in figures 2007, International Iron and Steel Institute

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TABLE: 4.1.1: TRENDS IN THE PRODUCTION OF STEEL INDUSTRY IN INDIA AND THE GLOBE: A COMPARISON
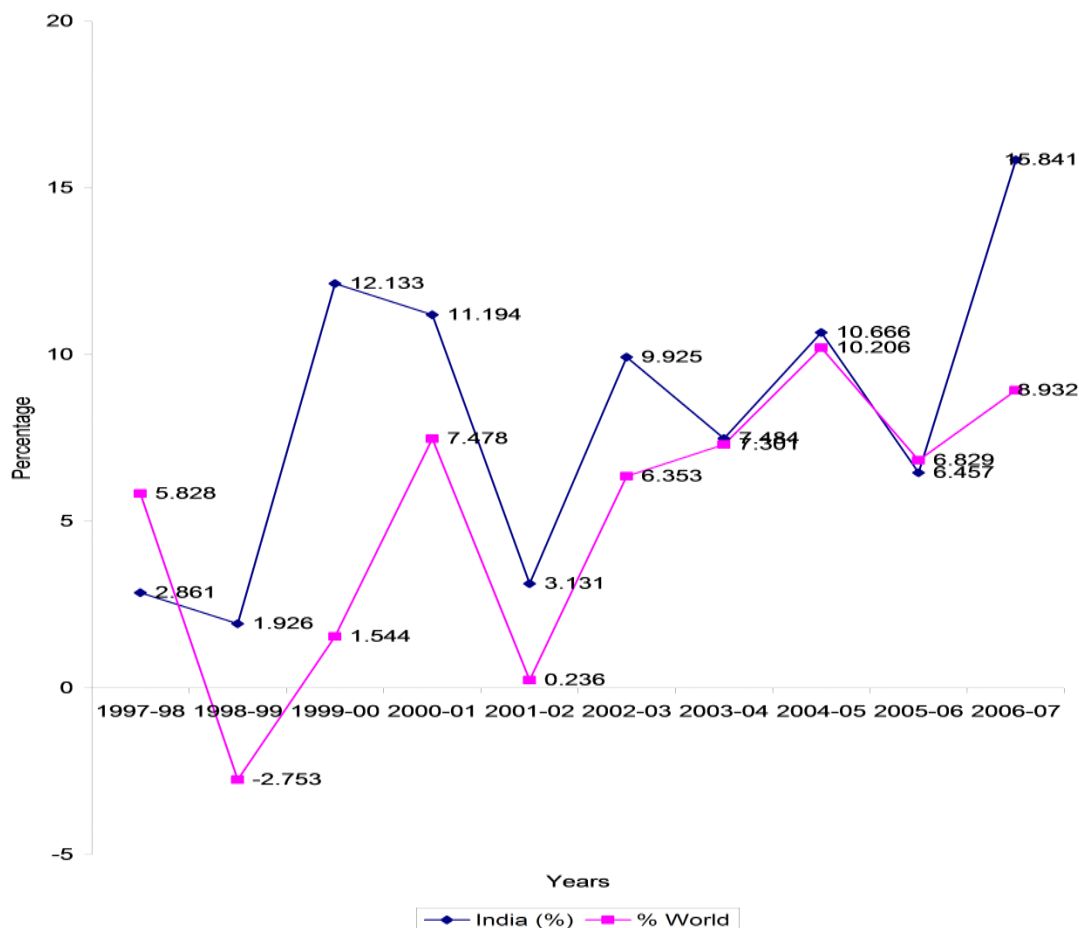
STRUCTURE OF STEEL INDUSTRY IN INDIA

Structural changes in an industry can be better understood by the interrelationship among the variables output, capital and labour. These interrelationships include the estimation of Capital-Output Ratio (K/O), Labour-Output Ratio (L/O) and Capital-Labour Ratio (K/L). Hence ratios among these variables are estimated for the Indian steel industry for the period 1997-98 to 2006-07

CAPITAL-OUTPUT RATIO (K/O)

Capital-Output Ratio is a measure of requirement of capital per unit of output. Theoretically, the ratio is expected to fall over a period of time. The declining trend in the K/O is an indicator of the better performance of the industry. Similarly lower K/O denotes better use of capital as it indicates higher capital efficiency.

TABLE: 4.2: TRENDS IN CAPITAL OUTPUT RATIO OF STEEL INDUSTRIES

Sl. No.	Year	Small Firms	Large Firms	All Firms
1.	1997-98	2.854	3.185	3.148
2.	1998-99	3.141	3.843	3.764
3.	1999-00	3.714	3.671	3.675
4.	2000-01	2.716	3.204	3.151
5.	2001-02	3.369	3.645	3.624
6.	2002-03	3.080	3.000	3.005
7.	2003-04	3.898	2.943	3.002
8.	2004-05	4.293	2.536	2.626
9.	2005-06	4.785	3.192	3.284
10.	2006-07	4.512	2.199	2.296
	Mean Growth	**3.636**	**3.142**	**3.158**
	CV	**19.828**	**16.261**	**14.707**

Source: Estimated based on Capitaline Database

Table 4.2 presents the estimates of the trends in K/O in the Indian steel industry for the period 1997-98 to 2006-07. At the aggregate level, K/O was observed to be at around 3 as the mean value was estimated at 3.158 for the entire industry. This was in the range of 2.296 (2006-07 and 3.764 (1998-99). The annual variation of K/O is on the decline indicating better use of capital in the Indian steel industry.

This declining trend is not applicable to all the firms operating in this industry. When the firm size is considered, there exists heterogeneity in the estimated values of K/O. In the case of small firms, the trend in K/ O was found increasing. It was 2.854 in 1997-98 and gradually increased to 4.512 in 2006-07.The mean K/O of small firms was also estimated to be higher (3.636 than the mean K/O of the industry as a whole (3.158). The increasing K/O of small firms means that small firms require more capital to produce one unit of capital than what it was required in the initial period of the study. This is again an indicator of the capital inefficiency in the small firms.

The capital output ratios of the large firms are also estimated and the same has been presented in the Table 4.2. As against the small firms, the large firms in the Indian steel industry experienced declining K/O during the study period. It was estimated at 3.185 in 1997-98 and gradually declined to 2.199 in 2006-07. The mean value of K/O of large firms was also found to be marginally lower (3.142) than the industry average (3.158). Large firms have higher level of production and they could reap the benefits of economies of scale of production. As a consequence they could make better use of capital leading to an increase in the capital efficiency.

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CHART: 4.2.2: TRENDS IN CAPITAL OUTPUT RATIO OF STEEL INDUSTRIES
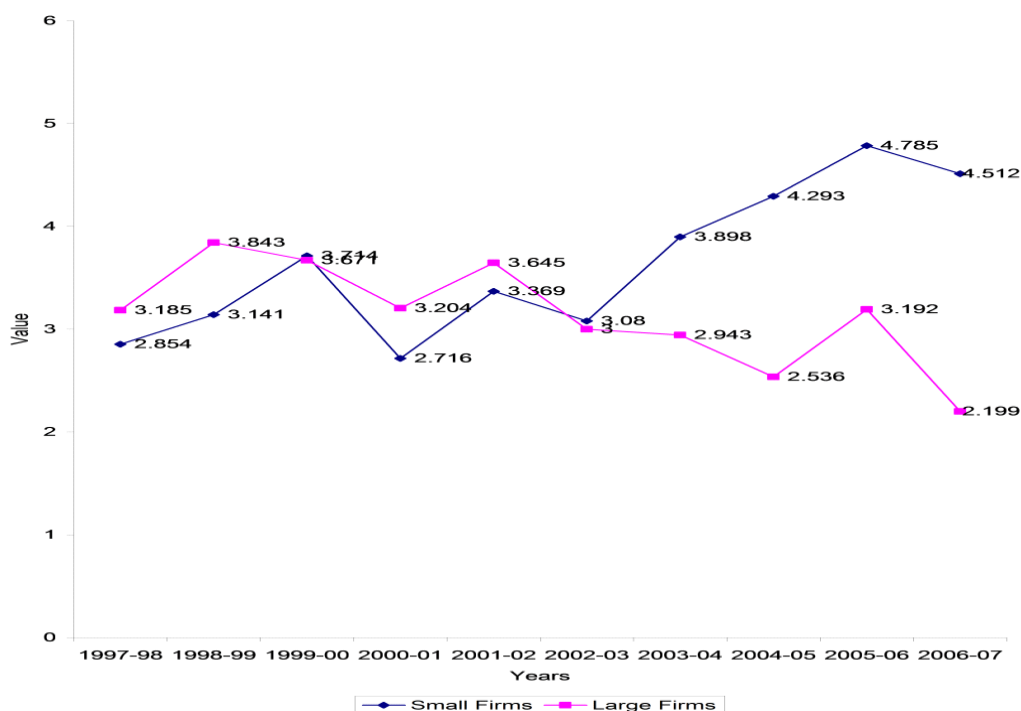
LABOUR-OUTPUT RATIO (L/O)

Labour-Output Ratio (L/O) represents the requirement of number of workers to produce per unit of output. Theoretically, it is expected that, as the industry gains benefits of technical advancements, this L/O is required to decline over the period. The lower and declining L/O is always preferred as it indicates increasing labour efficiency.

Table 4.3 depicts the estimated values of labour-output ratios of Indian steel industry for the small, large and for the entire industry. It could be noticed from the table that the L/O was found declining at the aggregate level. It was 0.364 in 1997-98 and it declined to 0.138 in 2006-07 for the entire industry. Despite this declining trend, the mean value of L/O was estimated at 0.302 for the entire industry for the period 1997-98 to 2006-07

TABLE: 4.3: TRENDS IN LABOUR OUTPUT RATIO OF STEEL INDUSTRIES

Sl. No.	Year	Small Firms	Large Firms	All Firms
1.	1997-98	2.053	0.155	0.364
2.	1998-99	1.980	0.167	0.372
3.	1999-00	2.564	0.209	0.453
4.	2000-01	1.678	0.164	0.330
5.	2001-02	2.691	0.207	0.392
6.	2002-03	2.028	0.179	0.307
7.	2003-04	1.569	0.150	0.238
8.	2004-05	1.594	0.128	0.203
9.	2005-06	1.690	0.132	0.222
10.	2006-07	1.508	0.077	0.138
	Mean Growth	**1.936**	**0.157**	**0.302**
	CV	**21.444**	**24.857**	**32.728**

Source: Estimated based on Capitaline Database

In accordance with the industry both small and large firms have recorded declining L/O during the study period. The L/O was at 2.053 in 1997-98 but declined marginally to 1.508 in 2006-07 for the small firms. In the case of large firms, the decline in the L/O was found significant as it feel from 0.155 in 1997-98 to 0.077 in 2006-07. Between small and large firms, the decline in the L/O was found higher for large firms. Though both the firms recorded declining trend, the mean L/O of the large firms was comparatively lower (0.157) than the small firms (1.936) and also lower than the industry average (0.302). The continuous decline in the estimates of L/O indicates increasing labour efficiency in this industry and the increasing labour efficiency was higher for the large firms compared to small firms operating in Indian steel industry.

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CHART: 4.3.3: TRENDS IN LABOUR OUTPUT RATIO OF STEEL INDUSTRIES
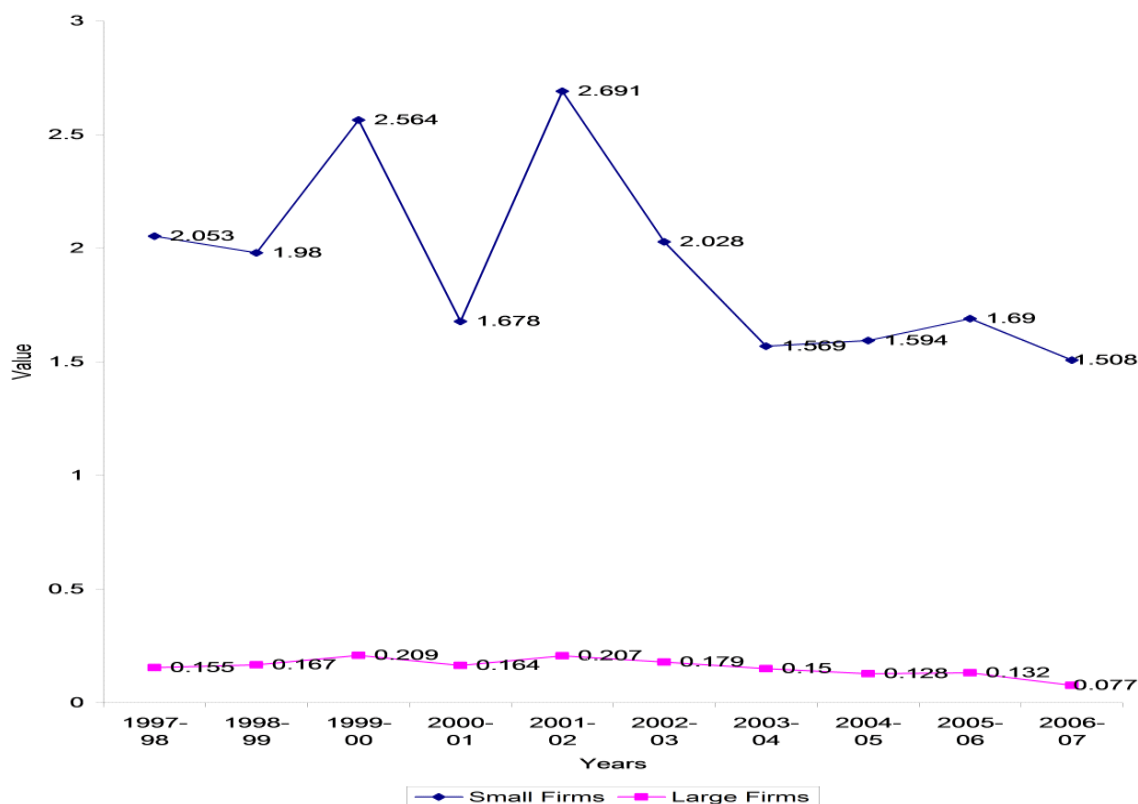
CAPITAL-LABOUR RATIO (K/L)

Capital-Labour Ratio is a measure of availability of capital per unit of labour. Theoretically, as against capita-output (K/O) and labour-output ratio (L/O), capital-labour (K/L) is expected to increase over time. The technological advancements would result in higher investments in the industry leading to more availability of capital per unit of labour. Growth theories also postulate that higher K/L will result in lower L/O leading to an increase in labour efficiency. Table 4.4 presents the estimates of K/L for the period 1997-98 to 2006-07 for the small and large firms in the Indian steel industry.

TABLE: 4.4: TRENDS IN CAPITAL LABOUR RATIO OF STEEL INDUSTRIES

Sl. No.	Years	Small Firms	Large Firms	All Firms
1.	1997-98	1.391	20.541	8.638
2.	1998-99	1.586	22.992	10.112
3.	1999-00	1.449	17.571	8.107
4.	2000-01	1.618	19.516	9.545
5.	2001-02	1.252	17.599	9.256
6.	2002-03	1.518	16.721	9.793
7.	2003-04	2.484	19.582	12.624
8.	2004-05	2.693	19.752	12.909
9.	2005-06	2.832	24.175	14.815
10.	2006-07	2.993	28.442	16.679
	Mean Growth	1.981	20.689	11.248
	CV	34.362	17.359	25.464

Source: Estimates based on Capitalize Database

The mean K/L for the entire industry was estimated at 11.248 during the study period. It was in the range of 8.638 in 1997-98 and 16.679 in 2006-07. It could be noticed from the table-4.4 that the K/L in the industry doubled from 8.638 to 16.679 over the period of study under consideration. This increasing trend in the K/L was observed both in small and large firms but differ in magnitude. In the case of small firms the K/L was found increasing from 1.391 in 1997-98 to 2.993 in 2006-07. The annual change in K/L of small firms was steady particularly after 2001-02. With the varying annual changes, the mean K/L of small firms was estimated at 1.981 during the period of study.

The capital-lab our ratio (K/L) of large firms showed a remarkable level when compared with small firms. The mean K/L of large firms was estimated at 20.689. It was almost 10 times higher than that of small firms and doubled that of entire industry. The change in K/L was mixed till 2002-03 and then onwards there was continuous increase in the K/L of large firms. The K/L of large firms increased from 20.541 in 1997-98 to 28.442 in 206-07 with the least rate recorded at 16.721 in 2002-03.

Large firms, in general, have higher capital base and they are more technically advanced when compared to small firms. Due to increasing growth of capital and declining rate of lab our there was a higher K/L of large firms in the Indian steel industry. From the Table 4.4, it could be noticed that K/L of both small and large firms increased. The K/L of large firms was found to significantly higher than small firms but the increase in K/L was fund higher in small firms as it increased from 1.391 to 2.993, double the increase over the period 1997-98 to 2006-07.

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CHART: 4.4.4: TRENDS IN CAPITAL LABOUR RATIO OF STEEL INDUSTRIES
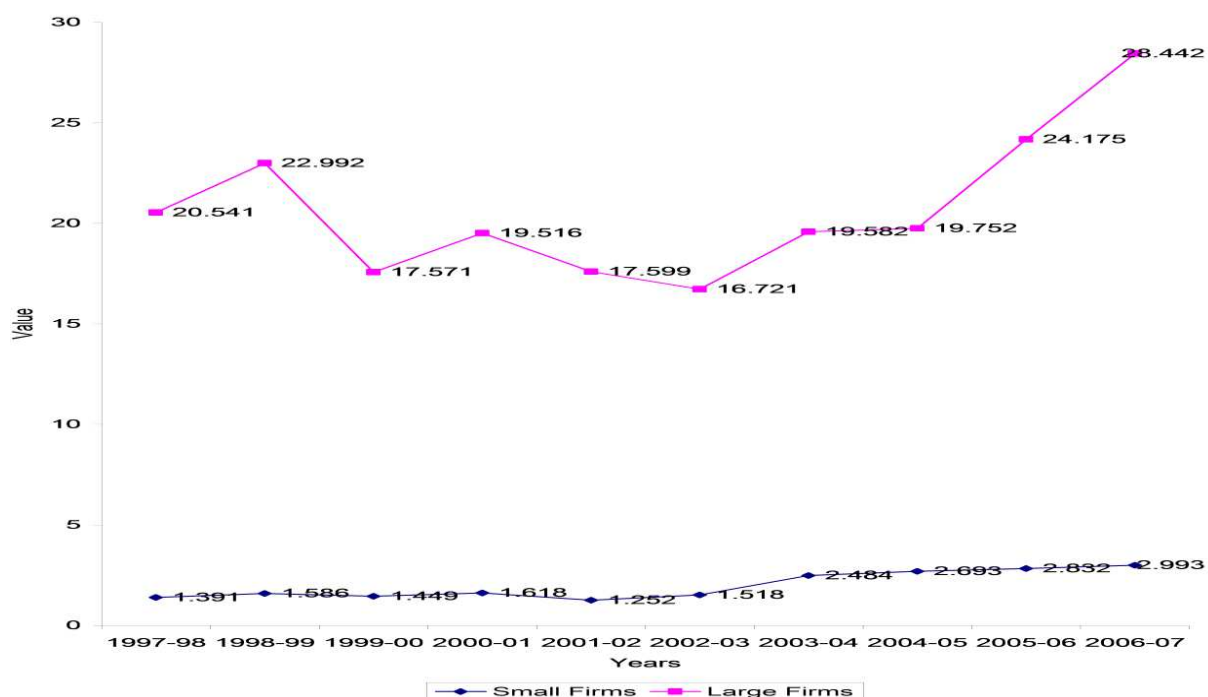
SUMMARY

Steel industry was the first core sector freed from the government intervention after economic reforms in 1991. The detailed analysis made revealed the structural changes that have taken place during the period 1997-98 to 2006. A brief summary of the analysis has been presented in this section Steel production has increased in accordance with the global production. While the average growth of global steel production was 5.195 per cent, steel production in India increased at an average rate of 8.162 per cent. Similarly, the share of India in the global steel production also increased from 2.925 per cent in 1997-98 to 3.970 per cent in 2006-07.

The interrelationship among the variables, were also estimated in terms of capita-output ratio (K/O), labour-output ratio (L/O) and capital-labour ratio (K/L). The K/O was found declining at the industry level indicating greater capital efficiency. The small firms were found to have higher level of K/O (mean value of 3.636) than the large firms (3.142). The lower K/O of large firms was an indication of higher capital efficiency than that of small firms. The mean L/O was estimated at 0.0302 for the entire industry. There was declining trend in L/O of both small and large firms but the fall was more for large firms than the small firms. This declining trend in L/O is again an indication of higher labour efficiency. Similarly, there was a significant growth in K/L which was almost doubled from 8.638 in 1997-98 to 16.679 in 2006-07 for the entire industry. The increase was common in both small and large firms. While the increase was from 1.391 to 2.993 for the small firms, it was from 20.541 to 28.442 for the large firms. The K/L of large firms was found higher than that of small firms but the rate of increase found greater for the small firms.

A general conclusion that could be made from the analysis is that, in all the measures, there was a significant improvement in the Indian steel industry. Within the industry, the performance of large firms was found to be significantly higher than that of small firms. The small firms may have certain advantages like lower wage rate, but the large firms, due to the benefits of scale of production, could perform much better than the small firms in the Indian steel industry during the period 1997-98 to 2006-07.

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A STUDY: EMPLOYEE'S JOB SATISFACTION, ITS ANTECEDENTS AND LINKAGE BETWEEN CUSTOMER SATISFACTION AND EMPLOYEE SATISFACTION

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ABSTRACT

In order to execute well-informed business decisions, managers need more than a ledger of numbers to understand what is really taking place "on the front line." The extensive studies have shown that motivated and satisfied employees tend to contribute more in terms of organizational productivity and maintaining a commitment to customer satisfaction. Satisfaction is infectious and it indeed permeates across the employee-customer boundary, where revenue and brand image are continuously at stake. As the production and marketing of product/services involve human interaction between producer and consumer, the question is relevant to what extent the marketing function intersects with production and HRM functions. So this paper particularly deals with the relationship between employees versus customer satisfaction. If the two are found to be mutually reinforcing, then company policies should take that fact into consideration. Motivation of staff hinges on a joint effort of production, HRM and marketing managers. And in reverse, staff motivation is a key element in successful marketing. Customer satisfaction and increased profitability can be achieved by managing the quality of employees and by improving employee satisfaction. Since customer satisfaction feeds back into employee satisfaction, is a competitive advantage. In this paper, I first discuss conceptualization of employee satisfaction, its antecedents and its relevant importance to firm's profitability. Then, I discuss how employee satisfaction is linked with customer satisfaction. Moreover, I provide suggestions to improve employee satisfaction to foster customer satisfaction. This study may have practical significance for HR manager and marketing manager to satisfied and retain their loyal and committed employees and customers.

KEYWORDS

Employee satisfaction, Productivity, Commitment, Customer satisfaction, Profitability.

INTRODUCTION

Job satisfaction describes how content an individual is with his /her job. Job satisfaction is individual's overall attitude on his/her job (Robbins, 1999). Drever (1964) described job satisfaction ''as an end state of feeling.'' The happier people are within their job, the more satisfied they are said to be. Job satisfaction is an important criterion for the success of an organization. It is closely associated with life satisfaction, job performance, absenteeism; turnover and psychological distress are significantly affected by employee satisfaction (Davis, 1992; and Spector, 1997). According to Locke (1976), job satisfaction is an emotional reaction that "results from the perception that one's job fulfills or allows the fulfillment of one's important job values, providing and to the degree that those values are congruent with one's needs". Ilgen(1971) and McFarlin and Rice (1992), conceive of job satisfaction as resulting from the size of the discrepancy that one perceived, if any, between what he expects to receive from his work and what he perceives he is receiving. Pinder (1997) suggests that the satisfaction results from at least three general types of perceptions. First, the person must see that there is a positive increment in the level of desired outcomes he/she receives. Second, the shorter the period over which the improvement occurs, the greater is the feeling of satisfaction (called the notion of velocity). Third, positive increase in the rate of positive change also adds to the sensation of satisfaction. Locke and Lathan (1976) give a comprehensive definition of job satisfaction as pleasurable or positive emotional state resulting from the appraisal of ones job or job experience and is a result of employee's perception of how well their job provides those things that are viewed as important. According to (Mitchell and Lasan, 1987), it is generally recognized in the organizational behavior field that job satisfaction is the most important and frequently studied attitude. Job satisfaction is so important in that its absence often leads to lethargy and reduced organizational commitment (Moser, 1997). Lack of job satisfaction is a predictor of quitting a job (Alexander. et. al, 1997; Jamal, 1997). Sometimes workers may quit from public to the private sector and vice versa. At the other times the movement is from one profession to another that is considered a greener pasture. This later is common in countries grappling with dwindling economy and its concomitant such as poor conditions of service and late payment of salaries (Nwagwu, 1997). In such countries, people tend to migrate to better and consistently paying jobs (Fafunwa, 1971). Organizational Antecedents of Employee Satisfaction and Employee Customer Service

Some researchers have focused on organizational antecedents of employee satisfaction and employee customer service. Yoon, Hyun Seo, and Seog Yoon (2000) identify three antecedents:

1. Perceived organizational support (POS), that is, the extent to which employees perceive that the organization values their contributions and cares about their well-being.

2. Perceived supervisory support (PSS), that is, the extent to which supervisors develop a climate of trust, helpfulness, and friendliness; high PSS implies that important socio emotional resources are immediately available in the work environment.

3. Customer participation, that is, the extent to which a customer is physically, mentally, and emotionally involved in the delivery of a service/product. At this level, both the resources/information that customers bring into the transaction and the actual behaviors they engage in are important.

It was found that all three antecedents affect employee service quality through their effect on employee service effort and perceived job satisfaction. Empirical findings suggest that:

1. Of the three antecedents, perceived supervisory support is the single most powerful predictor of job satisfaction and employee service effort.

2. Job satisfaction is a more important predictor of employee service quality than employee service effort.

SUMMARY OF A NUMBER OF PREVIOUS STUDIES INDICATING THE VARIOUS ANTECEDENTS OF EMPLOYEE SATISFACTION	
S. No	**Antecedents studied**	**Auther's name (year)**
1.	Intrinsic reward(Autonomy, achievement in work, recognition, promotion opportunities, skill variety, task identity, task significance, and feedback)	Edwin Theory (1976); Hackman, & Oldham (1976); (Coleman, 1976); Alexandros-Stamatios et. al. (2003); Lincoln and Kalleberg (1990)
2.	Extrinsic rewards(Hygiene factors include aspects of the working environment such as company policies, supervisory practices, pay and fringe benefits, promotion or advancement opportunities and other working conditions)	Hackman, & Oldham (1976); Adams (2000); Lincoln and Kalleberg (1990)
3.	Superior-subordinate communication and relation	Wheeless, and Howard (1984); Winska(2010); Heather et. al.(2005); Luthans & Larsen, (1986); Whitely, (1984),; Wheeless, Wheeless, and Howard (1984
4.	Work load and stress	Beehr (1995); (Cooper, et al. 1989); Cushway et. al.(1996); Hinshaw, et.al. (1983); Lucas, et. al. (1993); Dolan, 1987; Devereux, 1981; Nolan, (1995).
5.	Organizational Climate	James and Jones (1974); Locke, (1976); Payne and Pugh, (1976); Payne. et. al. (1976); Hellrigell and Slocum (1974); Bowen, & Ostroff, (2004); Wright, et. al,(2001); Wright. et. al,(2005)
6.	Job security	Arabi, (2000); Jandaghi, (2011); Preussand Lautsch, (2002) and Al-Najjar, (1996)

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INTRINSIC AND EXTRINSIC REWARDS

Lincoln and Kalleberg (1990) have argued that the rewards offered by an organization may have a powerful effect on employees' attitudes towards their job. The rewards may be classified into intrinsic and extrinsic rewards. The intrinsic rewards are those that exist in the job itself, such as variety, challenge, and autonomy. Extrinsic reward comprises elements such as pay and fringe benefits, promotion or advancement opportunities within the organization, the social climate, and physical working conditions. Driscol and Randall (1999) have argued that extrinsic rewards are strongly associated with continuance commitment and intrinsic rewards are strongly associated with job involvement and affective commitment. Employee satisfaction is defined as the satisfaction individual derives from intrinsic and extrinsic aspects of their careers, including pay, advance mental and developmental opportunities (Greenhose, 1990), the work environment and the reward structure offered on the job as well as the family obligations of the employees can be viewed as the factors of employee satisfaction (Dargahi and Sergi, 2007, Davis, 1992). Schneider et al.'s (2003) research demonstrates that employees can derive satisfaction from the knowledge or feedback that their organization is performing well and is accomplishing its goals and explored the relationships between several facets of employee satisfaction and organizational financial (return on assets; ROA) and market performance (earnings per share; EPS) . Their results showed consistent and statistically significant positive relationships (over varied time lags) between attitudes concerning satisfaction with security, satisfaction with pay, and overall job satisfaction with financial (ROA) and market performance (EPS). This rationale is consistent with recent research on the impact of financial and non financial incentives (e.g., training) on business-unit outcomes. For example, Peterson and Luthans (2006) used a quasi-experimental, control group design and found that both types of incentives had a significant impact on store profit, customer service, and employee turnover. Initially, the financial incentive had a greater effect on all three outcomes (as one might expect). Adams (2000) found that non-financial incentives include holidays, flexible working hours, access to training opportunities, sabbatical/study leave, planned career breaks, occupational health counselling and recreational facilities have impact on job satisfaction (Adams, 2000). Another study revealed that job satisfaction includes general elements and specific elements: the whole perception of job pleasure is considered as general elements; job security, pay, co-worker, supervision and personal growth and development are considered as specific elements and have impact on employee' job satisfaction (Hackman & Okham, 1980). Singh (1990) pointed out that the job satisfaction is a part of life satisfaction, the nature of one's environment off- the- job. Similarly, a job is an important part of life, job satisfaction influences one's general life satisfaction as an effective reaction, feeling of employees with job, supervision, coworkers, salary/pay and his/her current and future career progress. Maslow (1954) suggested that human needs form a five-level hierarchy ranging from physiological needs, safety, belongingness and love, esteem to self-actualization. Herzberg et al. (1959) formulated the two-factor theory of job satisfaction and postulated that satisfaction and dissatisfaction were two separate and sometimes even unrelated phenomena. Intrinsic factors named 'motivators' (that is, factors intrinsic to the nature and experience of doing work) were found to be job 'satisfiers' and included achievement, recognition, work itself and responsibility. Extrinsic factors which they named 'hygiene' factors were found to be job 'dissatisfiers' and included company policy, administration, supervision, salary, interpersonal relations and working conditions. Satisfaction on a job might be motivated by the nature of the job, its pervasive social climate and extent to which workers peculiar needs are met. Working conditions that are similar to local and international standard (Osagbemi, 2000), and extent to which they resemble work conditions of other professions in the locality. Other inclusions are the availability of power and status, pay satisfaction, promotion opportunities, and task clarity (Bolarin, 1993; Gemenxhenandez. et. al, 1997). It is a depended variable affected by such variables as wage, benefits, relations with colleagues and superiors, job security and job type. Additionally, employees' commitment to job evokes their working consciousness which will lead into performing the affairs better and rationalism due to faith enhancement (Steers et al., 1993; Ozer and Gunluk, 2010). According to Smith, Kendall and Hullin, there are five job traits which show remarkable characteristics of a job including job satisfaction, satisfaction from superior, satisfaction from colleagues, satisfaction from promotion and satisfaction from wage/salary (Hosseinzadeh and Saemian, 2002). Human relations researchers further argue that employee satisfaction sentiments are best achieved through maintaining a positive social organizational environment, such as by providing autonomy, participation, and mutual trust (Likert, 1961).

SUPERIOR/SUBORDINATE COMMUNICATION

Supervisor-subordinate communication has been one of the most popular areas in organizational communication research. Research has shown that one-third to two-thirds of the managers' time communicating with subordinates (Jablin, 1985) and most supervisory communication is verbal and occurs in face-to-face contexts (Luthans & Larsen, 1986; Whitely, 1984, 1985). In 1987, organizational communication – job satisfaction studies were summarized by Pincus and Rayfield. Studies of superior and subordinate communication have been pervasive in the organizational communication literature. Jablin (1979) noted that such research has been an ''object of investigation by social scientists for most of the 20th century'' . Among the reasons for the interest is that subordinates communicate with superiors to (a) reduce uncertainty about their environment and roles (Jablin & Krone, 1994), (b) individualize the organization to meet their needs (Jablin, 1982), and (c) assess their specific place in the organization (Sias & Jablin, 1995). Superiors' quality of communication with subordinates is also a critical element to an effective superior subordinate relationship. Equally, Lee and Jablin (1995) considered subordinate's high-quality communication with superiors as critical to meeting their personal, relational, and organizational goals. Thus, research findings support the importance of preserving a functioning relationship between superiors and subordinates. In 1995, Lee and Jablin investigated subordinates' need to maintain superior and subordinate relationships in deteriorating, escalating, and routine situations.. Kramer's (1995) longitudinal study examined the importance of communicating with superiors during change, such as in the case of job transfers. The study's results indicated that during the first year at a new location, transferees needed high-quality superior subordinate communication primarily for feedback and social support. Satisfaction is a response by the subordinate to the task or relationships. Thus, one contributing factor to satisfaction is tied to interpersonal relationships at work (Jablin, 1979; Jablin & Krone, 1994). For example, Interpersonal Needs Theory suggests that employees will be more satisfied with superiors if superiors meet their needs for communication, feedback, and personal growth (Hackman & Johnson, 2000). Jablin stated that "in an open communication relationship between superior and subordinate, both parties perceive the other interactant as a willing and receptive listener and refrain from responses that might be perceived as providing negative relational or disconfirming feedback." (Jablin, 1979,) Openness in supervisor-subordinate communication involves two interrelated dimensions: openness in message-sending and openness in message-receiving (Redding, 1972). Many researchers reported that subordinates' perceptions of openness are positively related to their job satisfaction, and in particular their satisfaction with supervision. Wheeless, and Howard (1984) suggested that subordinates' perceptions of supervisory "receptivity" (openness in message receiving) are a powerful predictor of workers' job satisfaction. On the other hand, Tjosvold (1985a, b) found that subordinates' perceptions of openness are also related to the nonverbal warmth (communicated through eye gaze, posture, facial expression, and voice tone) displayed by superior in their interactions with subordinates. Regarding upward communication, one of the more frequently reported results is that subordinates are often hesitant to communicate upward information that is unfavorable or negative to them. Fulk and Mani (1986) examined the degree to which supervisors' downward communications affects the accuracy and frequency of subordinates' upward communication distortion. They suggested a reciprocal relationship between superiors' and subordinates' communication behaviors such that "subordinates reported withholding information and generally distorting communication sent upward when their supervisors were seen as actively withholding information". Some studies focused on the communication behaviors of "effective" compared to "ineffective" superiors. Manz and Sims (1984) reported that effective "unleaders" (leaders/coordinators of self-managed groups) display distinctive types of communication behaviors such as encouraging open discussion of problems, acting as a communication link with other groups. Furthermore, Reddings, after reviewing the researchers, summarized that good supervisors are considered to be: (1) "communication minded" – enjoy communicating; (2) approachable, open, willing, and empathic listeners; (3) oriented toward asking or persuading in contrast to demanding or telling; (4) sensitive to the needs and feelings of subordinates; and (5) open in communicating information to subordinates and willing to explain "why " policies and regulations are being enacted (Reddings, 1972,). Other studies have focused on the exploring relationships between a number of superiors' and subordinates' communication-related characteristics and subordinates' levels of job satisfaction. For example, Johnson, Luthans, and Hennessey (1984) reported that "internal"(with respect to locus of control) supervisors tend to use persuasion more with subordinates than "external" leaders, and that supervisor persuasiveness is positively related to subordinate satisfaction with supervision. Relatedly, Infante and Gordon (1985) suggest that subordinates' satisfaction with supervision are positively related to the degree to which they perceive their superiors as high in argumentativeness and low on verbal aggressiveness. Similarly, Richmond, McCroskey, and Davis (1986) found

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that subordinate satisfaction is related to their supervisors' use of power and affinity-seeking strategies. On the other hand, Remland (1984) reported that perceptions of leader "consideration" are positively related to the degree to which supervisors display less status nonverbally and subordinates exhibit more status nonverbally. Lastly, in reviewing the literatures exploring feedback in superior-subordinate communication, Jablin concluded that feedback from superiors to subordinates appears related to subordinate performance and satisfaction, and a subordinate's performance to a large extent controls the nature of his/her superior's feedback (Jablin, 1979,). It was suggested that subordinates receiving feedback from sources high versus low in credibility judge the feedback as more accurate, the sources as more perceptive, tend to express greater satisfaction with the feedback, and are more likely to use the performance suggestions offered in the feedback (Bannister, 1986; Earley, 1986). Larson in 1986 stated that "Supervisors may often be reluctant to give subordinates negative performance feedback and this reluctance can affect both the content and frequency of the feedback they give". On the other hand, it was found that supervisors with limited authority and informal influence in decision making do not often use confrontative tactics (oral warnings) in disciplining subordinates (Beyer & Trice, 1984). Besides, positive supervisory feedback to new employees is negatively related to their turnover (Parsons et. al. 1985). Furthermore, supervisors tend to exhibit positive verbal reward behaviors more frequently in response to high performers, as opposed to goal-setting, punitive, and task information behaviors in response to low performers (Sims & Manz, 1984).

WORK STRESS AND LOAD

According to Beehr (1995) job stress is defined as "a situation in which some characteristics of the work situation are thought to cause poor psychological or physical health, or to cause risk factors making poor health more likely." Several studies have tried to determine the link between stress and job satisfaction. Job satisfaction and job stress are the two hot focuses in human resource management researches. According to Stamps & Piedmonte (1986) job satisfaction has been found significant relationship with job stress. One study of general practitioners in England identified four job stressors that were predictive of job dissatisfaction (Cooper, et al., 1989). In other study, Vinokur-Kaplan (1991) stated that organization factors such as workload and working condition were negatively related with job satisfaction. Fletcher & Payne (1980) identified that a lack of satisfaction can be a source of stress, while high satisfaction can alleviate the effects of stress. This study reveals that, both of job stress and job satisfaction were found to be interrelated. The study of Landsbergis (1988) and Terry et al. (1993) showed that high levels of work stress are associated with low levels of job satisfaction. Moreover, Cummins (1990) have emphasized that job stressors are predictive of job dissatisfaction and greater propensity to leave the organization. Sheena et al. (2005) studied in UK found that there are some occupations that are reporting worse than average scores on each of the factors such as physical health, psychological well-being, and job satisfaction. The relationship between variables can be very important to academician. If a definite link exists between two variables, it could be possible for a academician to provide intervention in order to increase the level of one of the variables in hope that the intervention will also improve the other variable as well (Koslowsky, et al., 1995). A strong negative relationship was found between clinical leadership, inter-professional collaboration, stress and job satisfaction (Konstantinos and Christina, 2008). The negative influence of stress on job satisfaction has been noted also in a number of studies (Cushway et. al.1996; Hinshaw, et.al. 1983; Lucas, et. al. 1993; Dolan, 1987; Devereux, 1981; Nolan, 1995). Survey of the literature on occupational stress reveals that there are a number of factors related to job which affect the behaviour of the employees and as a result of it, normal life is disturbed (McLean, 1974; Brief et. al, 1981). Cooper and Marshal (1976) stated that occupational stress includes the environmental factors or stressors such as work overload, role ambiguity, role conflict and poor working conditions associated with a particular job. Orpen (1991) observed that major source of stress is derived from the occupational environment; proponents of this view tend to argue that role holders in certain occupation, irrespective of individual differences, are much more likely to experience stress. Here, the emphasis is on the individual demands of various jobs that have the capacity over a period of time to exhaust the physical and psychological resource of employees in the organisation. Upadhyay and Singh (1999) found that the executive as well as the teachers experienced a moderate level of stress, the executives experienced more stress than the teachers did. The results revealed a significant difference between these two groups on the experience of stress due to factors such as role overload, intrinsic impoverishment and status variable. Emsley (2003) in their research study multiple goals and managers' job-related tension and performance suggested that job-related tension and performance deteriorate as managers pursue multiple goals although the relationship seems to be non-linear. The relative importance of goals does not appear to be important. Manshor, et.al. (2003) in their study examined that workloads, working conditions, and relationship at work were the main concern of the managers that lead to stress at the work place.

ORGANIZATIONAL CLIMATE

Job satisfaction is an effective or evaluative state while the concept of climate is a descriptive, cognitive, and non-evaluative construct (Wall, 1979). This classification is further emphasized in the work of (James and Jones, 1974; Locke, 1976; Payne and Pugh, 1976; Payne, Fineman and Wall, 1976). However, Hellrigell and Slocum (1974) have suggested that a dynamic relationship exists between job satisfaction and climate. Vroom (1964) postulated a model of job satisfaction which reflects valence of the job for its incumbent. He argued that the strength of the force on a worker to remain on his job is an increasing function of valence on his job. Rajendran (1987) reported significant correlation between organizational climate and job satisfaction in a public sector industry in Tamil Nadu, India. Srivastava (1994) studied a group of executives and supervisors and reported that overall organisational climate is positively related with job involvement and higher order needs (self esteem, autonomy, and self actualization) are related with job involvement. Ali and Akhtar (1999) explored the effect of organizational climate on job satisfaction and they reported that those who scored high on organizational climate also differed significantly on job satisfaction scale. Srivastava and Pratap (1984) and Sharma (1987) studied job satisfaction and organizational climate among executives and supervisors, reported a significant positive relationship between the over all climate and job satisfaction. Job satisfaction was also found related to various individual dimensions of organizational climate such as leadership, communication, interaction, influence in decision making, goal-setting and control. The predominant view has focused on the situational context (e.g., supervisory support) as a cause of satisfaction and has argued that high-performance work practices and thus a positive working climate foster employee satisfaction (Bowen, & Ostroff, 2004; Wright, Dunford, & Snell, 2001; Wright, Gardner, Moynihan, & Allen, 2005). In a study of 5,568 employees across 90 companies and 37,036 of their customers, it was found that organizational communication, employee engagement, and organizational culture are the three key antecedents to employee satisfaction (Kozzani and Oakley, 2005).

JOB SECURITY

Job security is one of the implications of security. In job security, there are issues such as job changes, missing the job and non achieving proper jobs. According to industrial and organizational psychologists, job security is one of the creators of job satisfaction and commitment (Thomas et al., 2006). When people are not certain about next month job, they can feel belonging to a group or a part of community with joint interests (Jandaghi, 2011). In past studies revealed that there is (Preussand Lautsch, 2002 and Al-Najjar, 1996) significant and positive relationship between job satisfaction and organizational commitment with job security is proved. Based on Maslow's needs hierarchy and his findings, Tannenbaum (1992) reports: in the third world countries, need to job security is the top priority (Tannenbaum, 1992). According to Arabi, job security is the feeling of having a proper job and the assurance of its continuance in future as well as the absence of threatening factors. If individual A feels that he/she will continue his/her job until the end of his/her service and will not be threatened by individual B to play his/her proper job roles and tasks, such person enjoys job security (Arabi, 2000). Herzberg's content analysis of interview data showed that job security was the most important extrinsic factor, but his approach has since been discredited (House & Wigdor, 1967; Vroom, 1964). Borgatta's (1967) notion of the "play-safe and security complex" was directly inspired by Herzberg. A secure job was defined as something "easy and pleasant to do, that would provide a good life for family, and sufficient comfort and leisure" (Borgatta, Ford, & Bohrnstedt, 1973). Borgatta's (1967) conceptualization contrasts job security with work orientation. His theory is somewhat normative. For example, he claims "it is questionable that the person is operating properly from the point of view of organized society, if he deliberately and methodically calculates all his actions to maximize playing safe and being secure". Super (1957) viewed security as ". One of the dominant needs and one of the principal reasons for working" .He incorporated the construct into his occupational development theory. He observed that the subjective meaning attributed to security varies but the main components of job security are always the same, namely, seniority and a stable company.

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Rosenberg (1957) studied the occupational values of college students and concluded that job security is based on a broader economic orientation. His view is consistent with Super's (1970) work values inventory in which security concerns economic returns. It is also consistent with Herzberg's two-factor theory. Blum (1960) continued this line of inquiry, identifying job security as a major factor in occupational choice. The variable has been included as a facet of job satisfaction in numerous studies-for example, Hackman and Oldham (1974). The results of studies by Alnajjar (1996) titled the relationship between job satisfaction and organizational commitment in UAE employees based on job security indicated that there is significant relationship between job satisfaction and job security (Ahmad, 1996).

IS HAPPY WORKER A PRODUCTIVE WORKER?

Human Relations perspective posits that satisfied workers are productive workers (Argyris, 1964; Likert, 1961; McGregor, 1960). Thus, organizational productivity and efficiency is achieved through employee satisfaction and attention to employees' physical as well as socio emotional needs. One study based on 7,939 business units in 36 companies found that, "on average business units in the top quartile on the employee engagement measure produced 1-4 percentage points higher in terms of profitability. Similar results were found for productivity (revenue or sales per month). Business units in the top quartile on employee engagement had, on average, from $80,000 to $120,000 higher monthly revenue or sales" (Harter, Schmidt, and Hayes, 2002). So satisfied employees are more productive, innovative and loyal, which in turn leads to customer retention (Corporate Leadership Council, 2003). Of course, dissatisfied employees will likely *lower* customer satisfaction. Employee satisfaction therefore becomes a critical leading indicator. What else can be interpreted from this other than that employee satisfaction plays a "strong, central role" (Yoon, Seo, and Yoon, 2004, p. 395) in predicting profitability and organizational effectiveness (Koyes, 2006). Ostroff (1992) found that satisfaction is an important social process factor that fosters organizational effectiveness. Schneider et. al. (2003). Specifically, their data supported causal relationships between financial and market performance outcomes and employees' overall job satisfaction and satisfaction for security. Thus, employees' job satisfaction sentiments are important because they can determine collaborative effort. Consistent with this reasoning, Likert (1961) has argued that collaborative effort directed towards the organization's goals is necessary for achievement of organizational objectives, with unhappy employees failing to participate (effectively) in such efforts. Harter et al. (2002) found that employee satisfaction resulted in higher productivity and reduction in employee turnover. Brown (1996) notes that some employees have found that satisfying or delighting employees is a prerequisite to satisfying or delighting customers, thus protecting the "bottom line''. No wonder Andrew Carnegie is quoted as saying: Take away my factories, and soon grass will grow on the factory floors. Take away my factories, but leave my people, and soon we will have a new and better factory''. In sum, available theory supports the contention that the satisfaction level of employees (as a whole) may relate to performance at the business-unit and/or organizational levels. Thus we can posit this evidence that aggregate employee attitudes have connections with organizational performance outcomes.

EMPLOYEE JOB SATISFACTION & CUSTOMER SATISFACTION: IS THERE A RELATIONSHIP?

Employee satisfaction is critical to achieve firms' success and profitability. Several studies have shown positive and significant effect of employee satisfaction on firm's profitability (Heskett, 1994; Rucci. et.al, 1998; Pugg, 2002; Dabholkar, 2008). Research has shown that one key to achieving customer satisfaction is employee satisfaction. While it has been long established that organizations with a quality foundation have better leverage for achieving high levels of customer satisfaction (Nilson, Johnson, and Gustafsson, 2001), attaining this goal results from being particularly focused on employee satisfaction. Some investigations have provided explicit measures of this relationship. For example, a study at Sears Roebuck & Co. showed that a five-point improvement in employee attitudes led to a 1.3 rise in customer satisfaction which, in turn, generated a 0.5 increase in revenues. Brooks (2000) reviewed the relationship between financial success and customer and employee variables (e.g., customer satisfaction, employee satisfaction, etc.) and found that, depending on market segment and industry, between 40 and 80 percent of customer satisfaction and customer loyalty was accounted for by the relationship between employee attitudes and customer-related variables. Similarly, Vilares and Cohelo (2000) found that perceived employee satisfaction, perceived employee loyalty, and perceived employee commitment had a sizable impact on perceived product quality and on perceived service. Satisfied employees tend to be more involved, dedicated, have greater organizational commitment, more loyal and productive towards customer needs, thus enhancing customer satisfaction, which is the ultimate aim of businesses today (Naeem,2010; Yee 2008; Kim, 2004; Heskett, 1997). Dabholkar, (2008) posits that reduction in employee turnover lead to profits due to the cost savings in not having to constantly hire and train new employees. In his Service Profit Chain Heskett (1994) demonstrate positive relationship between employee satisfaction and customer satisfaction which in turn enhance firm's profitability. He posits: —Profit and growth are stimulated primarily by customer loyalty. Loyalty is a direct result of customer satisfaction. Studies of factors common to successful companies (Porras & Collins, 1994) indicate that those companies whose goals reflect the interests of both employees and customers produce better results. High levels of customer satisfaction are predicted when employees are satisfied and loyal to the organization. Direct and quantifiable links exist between customer variables and employee variables, and financial performance There is growing evidence that supports a positive relationship between the two (Stock, 2005;Chigozirim, 200; Schneider, 1973; Hostage, 1975; Schneider et al., 1980; Carlzon, 1987; Schneider & Bowen, 1985; Schlesinger & Zornitsky, 1991; Schlesinger & Heskett, 1991a; Wiley, 1991; Rosenbluth & Peters, 1992; Dahlgaard et al., 1998). Heskett et al. (1997) describe the relationship between employee and customer satisfaction with their analogy of the *satisfaction mirror*, which conveys the idea that business success results from employee satisfaction being reflected in terms of customer satisfaction. Schlesinger and Heskett (1991b) claim that staff frustrations lead to high turnover, merely reinforcing the organizational approach of minimal training, poor rewards and poor customer service in a *cycle of failure* (Schlesinger & Heskett, 1991a). The mirror effect is also central to Normann and Ramirez' (1993) work on the value for designing interactive strategy and also to Liedtka et al.'s (1997) generative cycle of mutually reinforcing, self-sustaining employee and client development in professional services. In particular, the strength and richness of Heskett et al.'s contribution lies in the fact that the model interlinks and integrates many drivers of performance, drawing together many disparate claims about these interdependencies (Silvestro & Cross, 2000). Several studies involving empirical analysis of some of the links in the service-profit chain have been undertaken. For example, Schneider and Bowen (1985, 1993) provide documented evidence of the relationship between employee and customer satisfaction. Several empirical studies have shown that it is impossible to maintain a satisfied and loyal customer base without satisfied and loyal employees. Those studies suggest a significant impact on customer satisfaction following an improvement in employee attitudes. According to Brooks (2000) research, between 40 and 80 percent of customer satisfaction and loyalty is determined by the customer-employee relationship, depending on the industry and market segment that is being considered. For example, at Sears (Rucci et al., 1998), employee satisfaction accounts for 60 to 80 percent of customer satisfaction. At The Royal Bank of Canada (Brooks, 2000), 40 percent of the difference in how customers view its services can be directly linked to their relationships with bank staff. Pugh, 2002 points out that employee satisfaction lead to organizational outcomes such as customer satisfaction and financial performance. In consistent manner, Service Profit Chain proposed by Heskett, 1994 support positive link between employee satisfaction and customer satisfaction which in turn, enhance firm's profitability in the long run and Employee Customer Profit Chain proposed by Rucci. et. al, 1998 posits that employee satisfaction and customer satisfaction are positively related As suggested by this wealth of findings, positive changes in employee attitudes lead to positive changes in customer satisfaction. There is a "positive and significant relationship between customer satisfaction and employee satisfaction" (Bernhardt, Donthub, and Kennette, 2000); these relationships are "positive and statistically and substantively significant" (Brown and Lam, 2008, p. 243). "Employee satisfaction is significantly related to service quality and to customer satisfaction, while the latter in turn influences firm profitability…leading to a satisfaction-quality-profit cycle" (Yee, Yeung, and Cheng, 2008).

WHY EMPLOYEE SATISFACTION AFFECTS CUSTOMER SATISFACTION?

The literature offers several explanations for this question as:
Employees that interact with customers are in a position to develop awareness of and respond to customer goals and needs. Satisfied employees are motivated and empowered employees, in other words they serve customer needs and demands and deliver adequate effort and care. Satisfied employees have high energy and willingness to give good service and can deliver a more positive perception of the service/product provided. Satisfied employees can provide

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customers with interpersonal sensibility and social account as adequate explanations for undesirable outcomes. It has been suggested that these components of interactional justice have a significant impact on customer satisfaction. According to this view, because satisfied employees experience interactional justice, they can deliver it i.e. satisfied employees have enough emotional resources to show empathy, understanding, respect, and concern. Satisfied employees are committed and loyal and always try to increases and improve profitability, productivity and output quality. Further, employees' productivity influence service value perceived by customers. Service value means the results customer receive in relation to the total costs (both the price and other costs to customers incurred in acquiring the service). Service value has a positive connection with customer satisfaction, which leads to customer loyalty. Moreover, satisfied employees never resist organizational change and believe in organizational changes because they know without it they can neither compete with other organizations nor fulfill the requirements of the customers.

WHAT CAN WE DO TO CREATE HAPPY EMPLOYEES, THEN?

The empirical literature summarized in this report highlights the criticality of the relationship between employee satisfaction and customer satisfaction. How employees feel about their job has an impact on their work experience, but also on tangible business outcomes such as customer satisfaction, sales, and profit. Employees can strongly contribute to an organization's success by having a customer-centric approach in their work and in their work-related interactions. However, they are more likely to do so if they are satisfied with their job. The question is then: "What should organizations do to ensure high job satisfaction among their employees?" As found in the above discussed literature, employee satisfaction is the result of a holistic approach that involves strategic steps such as:

1. Identify root causes of dissatisfaction among employees.
2. Monitor employee satisfaction on a regular basis
3. There should be team and group work in the organization.
4. View employees as the primary source of competitive advantage
5. Show concern for total employee well-being.
6. Personality cult should be avoided and relation between superior and subordinate and peer groups should be improve.
7. Develop employee satisfaction measurement systems that can be used corporate   wide and worldwide.
8. Involve employee in organizations and employees affairs and develop effective communication channels
9. Deliver employee appraisals based on direct feedback from managers, co -workers, direct reports, and most importantly guests.
10. Training and assignments should be given to employees so that they can use their potential in proper way and it will also boost their motivational and satisfaction level
11. Compensation as an essential organizational determinant of job satisfaction so employees should be given according to their nature of work, risk involved in work and rules and regulations described by various laws and regulations.
12. Employee satisfaction can be enhanced by employing organizational better human resource practices such as training, recruitment, selection, etc, availability of job resources (organization support i.e. coworker support, supervisor support) and internal service quality.
13. Deliver fair and accurate appraisals and increase employee satisfaction. Align corporate guest satisfaction goals directly with employee performance, not only for customer facing employees but for everyone.

CONCLUSION

The relationship between employee satisfaction and customer satisfaction is complex and huge relevance so companies should develop a balanced approach to managing the market (its customers) and its employees, including the design of systematic tools that ensure that valuable employees translate their satisfaction into market performance. Monitoring employee and customer satisfaction and their determinants enhances understanding of the whole organization, and has the potential of creating a sustainable competitive advantage for the organization (Chigozirim, 2008). The employee-customer-profit framework set up in the Sears company provides a very practical example of how a set of total performance indicators can be implemented, using soft measures of employee satisfaction and customer satisfaction that enables the company to steer the company's financial performance by setting targets for HRM and marketing (Rucci et al., 1998). Empirical literature revealed that there is a logical linkage between the two simultaneously and the management perspective is simple happy employees create happy customer. Employees who serve happy customer are more likely to emerge from the interaction happy and so the interaction spirals. The fact is that your employees are pivotal to customer satisfaction, and satisfied customers are many times more likely to be repeat buyers than dissatisfied or even moderately satisfied customers. Given the direct links between employee satisfaction and customer satisfaction, and between customer satisfaction and improved financial performance, it is important to understand the elements that drive employee satisfaction.   At the end it can be said satisfied employees are more productive, innovative and loyal, which in turn leads to customer retention.

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PRODUCT DEVELOPMENT STRATEGIES FOR ROCKET MOTOR DEVELOPMENT - A STUDY ON COST AND TIME COMPRESSION STRATEGIES

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ABSTRACT

The product development has significance influence on the value of the finished product. Inadequate project planning and evaluation prior to product development compels the project to work with many bottlenecks, which have adverse impact on customer satisfaction when the product is delivered to the users. The product development strategies which involve the different levels of flexibility in project planning, for achieving, saving in project cost and time frame. The present paper focuses on the emerging trends in DRDO India and its cost and time compression strategies in the development of rocket Motor Development. The study further investigates on the opinions of the product development teams working with different levels of flexibility in pre-project planning, for achieving savings in project cost and time frame.

KEYWORDS
Cost and Time Compression, Defence Research & Development Organisation (DRDO), Pre-project, Rocket Motor.

INTRODUCTION
The present global environment has created huge challenges to industrial manufacturers such as fluctuating market conditions, aggressive competition, pricing pressures and rising costs for the raw materials. The highly differentiated products to market cost – effectively and with in compressed time frames are some of the other challenges for the manufacturers. The product development has achieved significance importance in the bringing the quality by standardizing and reusing proven components and assemblies. The present study will evaluate the cost and time compression strategies for rocket development at DRDO, Jagdalpur.

CONCEPTUAL OVERVIEW OF COST AND TIME
The cost and time has close relation. The project's time of completion and its cost has a relationship. For some types of costs, the relationship is in direct proportion; for other types, there is a direct trade-off. Because of these two types of costs, there is an optimal project pace for minimal cost. By understanding the time-cost relationship, one is better able to predict the impact of schedule change on project cost.

COMPRESSION
Compressing or crashing the project schedule refers to the acceleration of the project activities in order to complete the project sooner. The time required to complete a project is determined by the critical path, so to compress a project schedule to focus on critical path activities.
A procedure for determining the optimal project time is to determine the normal completion time for each critical path activity and a crash time. The crash time is the shortest time in which an activity can be completed. The direct costs then are calculated for the normal and crash times of each activity.

PRODUCT DEVELOPMENT STRATEGIES
Product development strategies help in the process of designing, creating and marketing an idea or product. The product can either be one that is new to the market place or one that is new to the particular company, or, an existing product that has been improved. All product development goes through a similar planning process.

BRIEF REVIEW ON ROCKET MOTOR PRODUCT
Rocket is a mechanism or a device or an engine by means of which required payload is delivered to the destination. The forward force to the rocket is imparted by the reaction to momentum of ejected matter called "Propellant" which is castled inside the rocket chamber. Hence, the propellant can be defined as the energy generating material contained inside the rocket motor, which undergoes combustion at a desired rate, producing low molecular weight gas molecular. These molecules are ejected out of the nozzle at high velocity and the reaction enforce imparts forward motion to the rocket motor.
Rocket Motor is work horse for any Missile. Rocket is a device or an engine by means of which required payload is delivered to the destination. Rocket Motor is the energy generating system. Product development process is generally based on product idea and concept evolved before project decision. Missile and rocket Motor development started in India as early as 1963. After 20 years of technology growth, in 1983 the Missile development required for armed forces was taken up. This includes the critical technology development, product development, manufacturing process development identification of production agencies, establishment of critical production facilities, technology transfer and finally production.

NEED FOR THE STUDY
The need for this research study is that the product developed by the study shall meet the quantity and mass production requirements with reference to the time schedules and automation systems that are state-of-art in nature. Compression or crashing the project schedule helps for the acceleration of the project activities in order to complete the project sooner. The procedure for determining the optimal project time is to determine the normal completion. This study supports all the strategies in the development of the product and problems in setting up, cost and time related concerns. The study further helps the different managerial grade persons to understand the importance of time and cost compression strategies.

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REVIEW OF LITERATURE

The select review on the literature survey is given below.

Namita singh and Alok Saklani (2001), in their study "Flexible project planning as a key success strategy for product Development for Dynamic Market Environment" presented that the product development process is generally based on product idea and concept evolved before project decision.   The study revealed that well-defined product concept, and proper planning will give fruitful results in production process.

Bruce Pollack-Johnson and Matthew. J. Liberatore (2001), in their study "Incorporating quality considerations into Project time/Cost tradeoff analysis and decision making" explained about the existing models and methods of project scheduling implicitly assumes uniform quality when evaluating time/cost tradeoffs, but do not model quality explicitly.

B.J. Zirger and Janet L. Hartley (2001), have studied "The effect of Acceleration Techniques on Product Development time". In this study they explained about bringing new products to the market place faster has become a strategic imperative in many markets, especially high technology industries. Much attention has focused on techniques purported to bring products to the market, more quickly, but little empirical research has been conducted to validate these techniques.

Tzvi Raz, Aaron j. Shenhar and Dov Dvir (2007), have studied "risk management, project success, and technological uncertainty". In their study they stated that in time of increased competition and globalization, project success becomes even more critical to business performance, and yet many projects still delays, overruns, and even failure. In their paper, they presented the results of a n empirical study devoted to this project success.

OBJECTIVES OF THE STUDY

The present study will focus on the following objectives.
1.   To study the profile of DRDO rocket Motor India with special reference to DRDO Jagdalpur.
2.   To analyze the Time-cost compression approaches used for the DRDO, Jagdalpur unit.
3.   To analyze the perceptions of employees of DRDO on the product development/cost & time compression
4.   To conclude and suggest based on the analysis of the study.

PROFILE OF DRDO, JAGDALPUR

Defence Research & Development Organisation (DRDO) established in 1958. The estimated budget is of US $1.18 billion in 2006. It has got a network of 5t2 laboratories, arranged under 10 technical directorates. Around 500 scientists and about 250000 other scientific, technical and support personnel are working for DRDO. At present DRDO is headed by Dr.V.K. Saraswat, SA to RM, Secretary, Department of Defence R & D and supported by 7 chief controllers. DRDO is working for the project which includes:

- LCA – Light combat Aircraft
- UAV – Unmanned Aerial vehicle
- EW - Electronic Warfare Gadgets
- Radars
- Tanks and Armored Vehicles
- Small arms, artillery systems and ammunitions
- Torpedoes
- Sonars
- Missiles IGMDP
- Brahmos – Privatization

DRDO   Research & Development Organization is engaged in developing indigenous knowledge and technology to look after the needs of defense forces of India. It is well known that almost all the areas of technology development are interdisciplinary in nature for which specialists belong to different specialties like engineering, Physics, chemistry, Biology and their sub-specialties need to interact in a constructive and cohesive manner. DRDO, Jagdalpur has achieved a remarkable success in developing Rocket Motors in India. The Central Government of India is conducting various developmental programmes to cater to the needs of Defence and research studies, that are playing a vital role in recognition of the nation in the world scenario with its all round performance. In the present scenario, the name of any nation will be highlighted with its domestic technology in research and Defence activities. Both of these fields are directly linked with the rocket motors. There is also one more institutions in India that is involved in product ion of rocket motors for space applications. Hence, the present paper focuses on the examination of cost and time compression strategies in Product Development at DRDO, Jagdalpur.

DRDO Jagdalpur unit develops the Rocket Motors of Various capacities at SF Complex, Jagdalpur. At Jagdalpur, the following facilities are used to carryout the processing and statistic testing of solid rocket motors. They are:
1.   Pre process facilities
2.   Process facilities (mixing, casting and premix storage, quality control laboratory)
3.   Post process facilities
4.   Transit storage facility
5.   BEM motor processing facility
6.   CAD Center
7.   Static Test Facility

TIME –COST COMPRESSION APPROACHES USED IN DRDO, JAGDALPUR

Compression or crashing the project schedule refers to the acceleration of the project activities in order to complete the project sooner. The procedure for determining the optimal project time is to determine the normal completion

There are 7 alternative approaches used for time-cost compression for DRDO, Jagdalpur unit. They are:

APPROACH – I

In this approach, generally work 'expands' to fill-up al the time avail for it. Available work always covers the working time leading to no scope for other works. Open-ended time approach consumes little more time than what is absolutely necessary. If targets are not clear then work is delayed an activities are taken lightly. Time compression is a work culture or a mind-set for targeting each and every activity for minimizing the time taken to complete the activity, as per the required quality standard without cutting corners.

Here the proper planning plays important role to ensure the apt completion of activity and related activities so that delays are minimized.

APPROACH 2

It covers advance pre-project planning, work execution, project review, monitoring & coordination, leadership & motivation, and also re-engineering of work systems/procedures/policies. Check list for each of above activities helps to review the status and take the corrective action in advance.   It is similar to zero-based budgeting approach, and aims at examining every activity/requirement and attempting to minimize the time involved. Working on each activity and completing in time helps in controlling the project as planned. It is a 'holistic management' approach, employing many best practices. Here the proved practices and systems that have given returns in terms of project execution prove to be time compression strategy.

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APPROACH 3

Like six sigma approach for zero-defect policy, it is also based on zero-tolerance regarding 'time wastages' or consuming more time. Each activity planned shall be completed within the specified period so that as a whole for bunch of activities the time wasted is within tolerance. Like 'six-sigma, I is also based on organization wise re-engineering of mind-se, work culture, and redesign of work processes & procedures.

APPROACH 4

In-depth understanding of customers' requirements & preferences are done in this approach. Extensive competitors' analysis, technology 0trend analysis, managing environmental dynamics, core-technology groups, outsourcing are the key considerations in this approach.

APPROACH 5

Encouraging risk-taking & innovation, empowerment & decentralization, use of cross-functional product teams, tough project0review, forward look monitoring & coordination, incentives for early completion, design for quality, design for manufacture , real-time transfer of technology and proper documentation at all stages are the key strategies in this approach.

APPROACH 6

Flexibility in design & technology, flexibility in product development processes, watch environmental dynamics, design & establish proper knowledge networks among various teams are the key considerations in this approach.

APPROACH 7

Using technology enabled tools, techniques and systems, product design with a mark-up on the users requirements, high degree of interaction with users through-out the project work, adopting quality systems, using effective inter-team & internal team communication, optimizing the work0stress and creating happy teams, effective diversity management and enforcing accountability for timeliness are the key strategies applied in this approach.

APPROACH 8

This particular approach is used for optimum process sequencing for smooth transition from product development to production of rocket motor. Production planning and preparations were conducted throughout development phase to identify production requirements and to resolve difficulties before production begins to achieve quality product. Unique Technology Transfer mechanism is also another key strategy of this approach.

ANALYSIS OF THE STUDY

The detailed analysis on the opinion of the sample respondents are given below.

A). **SAMPLE OF THE STUDY**

The research study has been conducted on the select sample respondents working in DRDO, Jagdalpur. The size of 200 is selected from the various levels in DRDO, Jagdalpur. The details are as follows.

TABLE NO. 1

Department	Administrative	Personal	Finance	Technical	Production	Total
Top Management	8 (20.0)	2(5.0)	10(25.0)	12(30.0)	8(20.0)	40(100.0)
Middle Management	12(20)	4(6.7)	10(16.7)	26(43.3)	8(26.6)	60(100.0)
Lower Management	24(24.0)	-	22(22.0)	34(34.0)	20(20.0)	100 (100.0)
Total	**44(22.0)**	**6(3.0)**	**42(21.0)**	**72(36.0)**	**72(18.0)**	**200(100.0)**

Source: Field Survey

From the sample study, it is to observe that majority of the respondents are from the Technical and Production Departments. And the Lower Management respondents are more compared to the other levels selected fro the research study.

B). **ANALYSIS ON THE OPINION OF SAMPLE RESPONDENTS**

I). **OPINION ON "VISIBILITY ON THE TOTAL DESIGNED COST DETERMINES THE PRODUCT COST AND TIME CONSTRAINTS"**

TABLE NO. 2

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	8(20.0)	10(16.7)	Q4(14.0)	32(16.0)
2	Rarely True	8(20.0)	16(26.7)	28*28.0)	52(26.0)
3	Sometimes true	10(25.0)	10(16.7)	18(18.0)	38(19.0)
4	Mostly True	4(10.0)	16(26.7)	16(16.0)	36(18.0)
5	Almost always True	10(25.0)	8(13.3)	24(24.0)	42(21.0)
	Total	40(100.0)	60(100.0)	100(100.0)	200(100.0)

Source: Field Survey

The table analyzes the response of the sample employees working in top, medium and low management levels regarding the visibility on the total designed cost determine the product cost and time constraints. Among the employees, majority group opined the statement is almost always true (25.0%), mostly true (10.0%) and some times true (25.0%). From the total employees in the middle management, 26.7% felt the statement is mostly true, 13.3% said almost always true and 16.7 % opined sometimes true. Out of the lower management sample employees 24% opined almost always true, 16% said mostly true and 18% said some times true about the statement.

II). **OPINION ON "VISIBILITY ON THE TOTAL DESIGNED COST DETERMINE THE PRODUCT COST AND TIME CONSTRAINTS"**

TABLE NO. 3

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	4 (20.0)	10(16.7)	14(14.0)	32(16.0)
2	Rarely True	8(20.0)	16(26.7)	28(28.0)	52(26.0)
3	Sometimes true	10 (25.0)	10(16.7)	18(18.0)	38(19.0)
4	Mostly True	4(10.0)	16(26.7)	16(16.0)	36(18.0)
5	Almost always True	10(25.0)	8(13.3)	24(24.0)	42(21.0)
	Total	40(100.0)	60(100.0)	100(100.0)	200(100.0)

Source: Field Survey

The table analyses the response of the sample employees working in top, medium and low management levels regarding the visibility on the total designed cost determine the product cost and time constraints. Along the total employees working in top management, majority group opined the statement is almost always true (25.0%), mostly true (10.0%) and some times true (25.0%). From the total employees in the middle management, 26.7% felt the statement is mostly true, 13.3% said almost always true and 16.7% opined sometimes true. Out of the lower management sample employees, 24% opined almost always true, 16% said mostly true and 18% said some times true about the statement.

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III). OPINION ON "DESIGN ENGINEERS CAN EVALUATE THE IMPACT OF DESIGN CHANGES ON DIRECT MATERIALS COSTS, ENGINEERING DESIGN COSTS AND MANUFACTURING COSTS

TABLE NO. 4

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	-	-	2(2.0)	2(1.0)
2	Rarely True	8(20.0)	6(10.0)	12(12.0)	26(13.0)
3	Sometimes true	2(5.0)	6(10.0)	10(10.0)	18*9.0)
4	Mostly True	-	22(36.7)	34(34.0)	56(28.0)
5	Almost always True	30(75.0)	26(43.3)	42(42.0)	98(49.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The responses of the sample employees working in top, medium and low management levels on the statement that design engineers can evaluate the impact of design changes on direct materials costs, engineering design costs and manufacturing costs. Regarding the total employees working in top management, majority group (75.0%) opined that direct materials costs, engineering design costs and manufacturing costs mostly evaluated by design engineers is true. From the total employees in the middle management, 43.35 said the above statement is almost always true, 36.7% said mostly true and 10% observed sometimes true. In the lower management sample employees, 42% said almost always true, 34% said mostly true and 10% said some times true regarding the statement.

IV). OPINION ON "COST REDUCTION IDEAS THAT WOULD BOOST PROFITS, CT LOSSES AND IMPROVE PRODUCTIVITY FOR MANUFACTURING UNITS"

TABLE NO. 5

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	8(20.0)	10(16.7)	20(20.0)	38(19.0)
2	Rarely True	6(15.0)	20(33.3)	20(20.0)	46(23.0)
3	Sometimes true	2(5.0)	10(16.7)	18(18.0)	30(15.0)
4	Mostly True	12(30.0)	16(26.7)	24(24.0)	52(26.0)
5	Almost always True	12(30.0)	4(6.7)	18(18.0)	34(17.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The table explains the opinion of the sample employees working in top, medium and low management levels on the cost reduction ideas would boost profits, cut losses and improve productivity for manufacturing units. From the total employees working in top management, 30.0% each group said the statement is mostly true and almost always true. Out of the total employees in the middle management, 6.7% said almost always true, 26.7 % said mostly true and 16.7% said some times true regarding the above statement. Among the lower management sample employees, 24% opined the statement is mostly true, 18% said almost always true and 18% said some times true.

V). OPINION ON "PRODUCT DEVELOPMENT TEAMS WORKING WITH DIFFERENT LEVELS OF FLEXIBILITY IN PRE-PROJECT PLANNING TO ACHIEVE SAVINGS IN PROJECT COST AND TIME FRAME"

TABLE NO. 6

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	4(10.0)	4(6.7)	10(10.0)	18(9.0)
2	Rarely True	2(5.0)	4(6.7)	14(14.0)	20(10.0)
3	Sometimes true	2(5.0)	8(13.3)	8(8.0)	18(9.0)
4	Mostly True	26(65.0)	38(63.3)	56(56.0)	120(60.0)
5	Almost always True	6(15.0)	6(10.0)	12(12.0)	24(12.0
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The response on the statement 'Product development teams working with different levels of flexibility in pre-project planning to achieve savings in project cost and timeframe' by the sample respondents working in the above three levels of management is presented in the above table. Among the total employees working in top management majority group (65.0%) openly said the statement is mostly true followed by almost always true(15.0%). Regarding the employees in the middle management also more than sixty percent (63.3%) opined the statement is mostly true, 10.0% said almost always true and 13.3% said sometimes true. Moreover, in the lower management sample employees, 56% said mostly true, 12% said almost always true and 8% said sometimes true regarding the statement.

VI). OPINION ON "TO GAIN COMPETITIVE ADVANTAGE, IT IS REQUIRED TO DELIVER HIGHLY QUALITY PRODUCT AT LOWER COST AND WITHIN COMMITTED TIME FRAME"

TABLE NO. 7

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	2(5.0)	6(10.0)	10(10.0)	18(9.0)
2	Rarely True	14(35.0)	4(6.7)	22(22.0)	40(20.0)
3	Sometimes true	4(10.0)	12(20.0)	14(14.0)	30(15.0)
4	Mostly True	14(35.0)	30(50.0)	42(42.0)	86(43.0)
5	Almost always True	6(15.0)	8(13.3)	12(12.0)	26(13.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The table analyses the opinion of the total employees working top, middle and lower management regarding the statement 'to gain competitive advantage, it is required to deliver high quality product at lower cost and within committed time frame'. From the total employees working in top management, a major group (35.0%) expressed the statement is mostly true followed by almost always true (15.0%) and some times true (10.0%). Among the total employees in the middle management, fifty percent opined the statement is mostly true, 13.0% said almost always true and 20% said some times true. Out of the lower management sample employees, 42% felt the statement is mostly true, 14% said sometimes true and 12% said almost always true.

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VII). OPINION ON "TIME PLAYS A SIGNIFICANT ROLE IN PRODUCTION MANAGEMENT"

TABLE NO. 8

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	2(5.0)	6(10.0)	2(2.0)	10(5.0)
2	Rarely True	2(5.0)	2(3.3)	12(12.0)	16(8.0)
3	Sometimes true	8(20.0)	4(6.7)	12(12.0)	24(2.0)
4	Mostly True	20(50.0)	32(53.3)	60(60.0)	112(56.0)
5	Almost always True	8(20.0)	16(26.7)	14(14.0)	38(19.0)
	Total	40(100.0)	60(100.0)	100(100.0)	200(100.0)

Source: Field Survey

The response of the sample employees working in top , medium and low management levels on the significant role played by the time in production management. Out of the total employees' work-in in top management, fifty percent opined that time plays a significant role in production management is mostly true and from the remaining 20% each said almost always true and some times true. In the middle management level, 53.3% of the employees responded time plays a significant role in production management is mostly true and from the remaining 26.7% agreed it is almost always true. From lower management sample employees, sixty percent felt the statement is mostly true, 14% said almost always true and 12% said some times true.

VIII). OPINION ON "COST AND TIME INTERLINKED WITH EACH OTHER. IF ONE INCREASES, OTHER DECREASE IN PLANNED MANAGEMENT"

TABLE NO.9

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	6(15.0)	10(16.7)	10(10.0)	26(13.0)
2	Rarely True	6(15.0)	10(16.7)	18(18.0)	34(17.0)
3	Sometimes true	10(25.0)	10(16.7)	24(24.0)	44(22.0)
4	Mostly True	2(5.0)	10(16.7)	26(26.0)	38(19.0)
5	Almost always True	8(40.0)	10(33.2)	22(22.0)	29(29.0)
	Total	40(100.0)	60(100.0)	100(100.0)	200(100.0)

Source: Field Survey

The table explains about the opinion on the linkage between cost and time in planned management by the employees working in top, middle and lower management. Out of the total employees in the top management level, majority group (40%) responded almost always true that there is a relation between cost and time in planned management, and from the remaining 255 said some times true and 5% said mostly true. Regarding the total employees in the middle management, 33.2% felt the statement is almost always true and 16.7% each said sometimes true and mostly true. Regarding the lower management sample employees, 26% said mostly true, 24% said some times true and 22% expressed that the statement is almost always true.

CONCLUSIONS

Product development strategy provides the framework to orient a company's development projects as well as its development process. To develop a good product development strategy, the company must determine its primary strategic orientation. From the sample survey and analysis on various questions pertaining to time and cost compression strategies, the following conclusions are made.

1. The analysis on "visibility on the total designed cost determine the product cost and time constraints" revealed that the top, middle and low management levels, majority of the employees positively responded towards the visibility on the total designed cost determine the product cost and time constraints, where middle management employees comparatively less than others.
2. The analysis on "visibility on the total designed cost determine the product cost and time constraints" revealed that in top , middle and low management levels, majority of the employees positively responded towards the visibility on the total designed cost determine the product cost and time constraints, where middle management employees comparatively less than others.
3. The analysis on "Design engineers can evaluate the impact of design changes on direct materials costs, engineering design costs and manufacturing costs" revealed that most of the employees in all the three management levels agreed that design engineers can evaluate the impact of design changes on direct materials costs, engineering design costs and manufacturing costs.
4. The analysis on "Cost reduction ideas that would boost profits, ct losses and improve productivity for manufacturing units" concluded that in the top management majority group of employees opined that the cost reduction ideas that would boost profits, cut losses and improve productivity for manufacturing units is mostly true and almost always true, where as in middle and lower management level employees not totally agreed with this.
5. The analysis on "Product development teams working with different levels of flexibility in pre-project planning to achieve savings in project cost and time frame" concluded that most of the employees under top, middle and lower management levels positively responded that the product development teams working with different levels of flexibility in pre-project planning to achieve savings in project cost and timeframe.
6. The analysis on "to gain competitive advantage, it is required to deliver highly quality product at lower cost and within committed time frame" concluded that a dominant group of employees in the top, middle and lower management levels more positive towards the statement "to gain competitive advantage, it is required to deliver high quality product at lower cost and within committed time frame'.
7. The analysis on "Time plays a significant role in production management" revealed that in almost all the management levels, majority of the employees felt time plays a significant role in production management is true.
8. The analysis on "Cost and time interlinked with each other. If one increases, other decrease in planned management" revealed that most of the employees in top, middle and lower management levels felt true regarding cost and time interlinked with each other. If one increase, other decrease in planned management.

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AN ASSESSMENT ON SERVICE QUALITY IN INDIAN INSURANCE INDUSTRY WITH SPECIAL REFERENCE TO UTTAR PRADESH REGION

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ABSTRACT

The purpose of this paper is to evaluate customers' general expectation and perception of insurers in terms of services offered at the insurance service counter (ISC). Other than that, this paper also examines the relationship between the demographic factors and SERVQUAL mean score. The study utilized the survey approach. The sample consisted of 50 respondents. The result shows huge gap for reliability, responsiveness and empathy, which reliability shows highest gap between customers' perception and expectation. This study illustrates reliability as the most critical determinant of SERVQUAL measure for service quality. The other dimensions (tangible, responsiveness, assurance and empathy) appear important but reliability dominates. Thus, results of this study underscore the need for insurance providers to gear customer service and quality improvement efforts towards components of reliability. The study intends to promote a better theoretical understanding and recognition of the complexities to service quality and its measurement. Nowadays, insurance companies in Indian compete each other to be a strong and good reputation. The challenge for insurance sector in Indian remains the same that is to bring innovative solutions to client while making them realize the value of those services provided. When clients realize that quality is something that cannot be compromised, an organization has to survive in the competitive market while managing high value service.

KEYWORDS

Service Quality, Reliability, Expectation, Perception, Insurance.

INTRODUCTION

The Indian Insurance industry cannot remain the exception to the rule any more. Some of them tried to implement e- business in some form or the other to make their business and services more efficient. Service marketing is a very sensitive aspect and that too management of services is really delicate, here the strategy revolves around the customer. The tidal wave of net-savvy culture has become a global phenomenon. Insurance is playing an increasingly larger role, both in the overall economy as well as in the lives of consumers. Today, financial services are growing at a rate beyond the imagination of any financial expert. In insurance companies every consumer is a unique market in himself/ herself. Hence building a strategic relationship with the customer is very essential. By identifying relationship with customer choice, a service marketer can identify the factors that can be leveraged in different service conditions. The main focus of my study will be on assessing service quality for its dimensions.

The study will explore on services with respect to Indian Insurance companies in present scenario and what moderating effects of these with respect to each other are as expected and perceived by the customers.

OBJECTIVE OF THE STUDY

- The purpose of this paper is to evaluate customers' general expectation and perception of insurers in terms of services offered at the insurance service counter (ISC).

SIGNIFICANCE OF THE STUDY

In 1993, Malhotra committee was set up with an objective of complementing the reforms in the Indian Financial sector. Its objective was to create an efficient and viable insurance industry, which will have a wide reach of insurance services, a variety of insurance products with a high quality of services to the public. With the promulgation of Insurance regulatory and Development Act, 1999 India is now the cynosure of all the global insurance players. Numerous players, both Indian and foreign, have commenced operations or have announced their intention to start their insurance in India. Liberalization of the insurance sectors has allowed foreign insurers to enter the market. New technology will give customers better, wider and faster access to products and services than the options offered earlier. This freedom of choice will place demands on business and this can be achieved only when insurance companies revamped and improved their product and delivery service just to stay afloat.

In order to remain competitive, insurance companies are increasingly "unbundling" the value- added chain, contracting out noncore support services and specializing in specific market segments. With the emerging situations, insurance companies should build strong services as it increases consumer trust and loyalty. Strong insurance companies have high mind share with customers, which ultimately results in higher market share. In marketing of financial services, it is the customer's experience that plays a very important role. Thus, service performers play the main differentiating role. Focus and strategy are essential for the development of product in this sector. If there was one industry which at least considered customer service as an essentiality it would be the financial service industry. Most of the insurance companies which are new in the market bring with them distribution strengths in their own fields but "insurance is about reaching to the last customer".

CONCEPTUAL ROOTS

According to Parasuraman et al, the five dimensions of service quality are reliability, responsiveness, assurance, empathy, and quality of tangibles referred to as SERVQUAL. There are three types of customer expectations predicted service, desired service, and adequate service which presents a comparison between customer evaluation of service quality and customer satisfaction (Valerie A. Zeithaml, Lonard L. Berry, and A.Parasuraman, 1993). SERVQUAL is widely used within service industries to understand the perceptions of target customers regarding their service need; it may also be applied internally to understand employee's perception of service quality with the objective of achieving service improvement (Zeithmal, Parasuraman and Berry 1988). SERVQUAL scale is a principal instrument in the services marketing literature forecastessing quality (Parasuraman vd., 1991; Parasuraman vd., 1988). This instrument has beenwidely utilized by both manager (Parasuraman vd., 1991) and academics (Babakus and Boller, 1992; Carman, 1990) to assess customer perceptions of service quality for a variety of services (e.g. Banks, credit card companies, repair and maintenance companies). The results of the initial published application of the SERVQUAL instrument indicated five dimensions of service quality emerged across a variety of services. These dimensions include tangibles, reliability, responsiveness, assurance and empathy (Zeithaml at al, 1990: 176; Brensinger and Lambert, 1990; Crompton and MacKay, 1989).*Tangibles* are the physical evidence of service , *reliability* involves consistency of performance and dependability ,*responsiveness* concerns the willingness or readiness of employees to provide services *assurance* corresponds to the knowledge and courtesy of employees and their ability to inspire trust and confidence, and finally,*empathy* pertains to caring, individualized attention that a firm provides it customers (Lassar *at al.*, 2000. The main aim of study is to assess service quality of insurance companies. The study applying cronbach's alpha and Gap Model i.e; the actual and the desired service quality. The questionnaire used in the study is comprised of three parts.

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Part A contains demographic profile of respondents including gender, age group, marital status, education, relevant sector. Part B includes expectations of respondents using a five -point Likert scale ranging from "strongly disagree=1" to "strongly agree". Part C consists perception. The data was analysed with the Statistical Package Program for Social Sciences (SPSS 12 for Windows). The basic analysis and tests utilized in the study include reliability analysis, include frequency and percentage analysis.

HYPOTHESIS

H1: Expectations and perceptions have influence on the services offered at the insurance service counter.
H0: Expectations and perceptions have no influence on the services offered at the insurance service counter.

RESEARCH METHODOLOGY

RELIABILITY TEST

The Cronbach's Alpha estimate indicates how highly the items in the questionnaire are interrelated in order to determine reliability of the instrument (Hayes, 1998). Nunnaly (1978) said that the Alpha which is more than 0.7 indicated a high liable. In this study, 69 items were tested on its reliability.
Table 1 shows the component and total reliabilities of SERVQUAL scores. The findings show that the reliability coefficients for all dimensions are above 0.70 The reliabilities are consistently high score all dimensions on expectation, which are 0.971 for tangibles, 0.767 for reliability, 0.861 for responsiveness, 0.842 for assurance and 0.756 for empathy.

TABLE1

Dimensions	Number of Attributes	Expectation (Desired)	Perception (Actual)
Tangibles	2	0.971	0.948
Reliability	7	0.767	0.711
Responsiveness	3	0.861	0.940
Assurance	3	0.842	0.895
Empathy	5	0.756	0.955

PROFILE OF RESPONDENTS

The profiles of the respondents are shown in the Table 2. The profiles focus on the demographic and economic of respondents. From the table, it shows that out of 50 respondents, 86% of the respondents are male and 14% are female. The highest education level attained by most of the respondents was Degree (graduate) level (56%), followed by masters (26%) and Intermediate (14%). It shows that majority of respondents were educated with high qualifications. The occupations of respondents were varied. The majority of the respondents were in businessman/self employed (44%) group, followed by pvt. job (24%), govt. employees (20%), lawyer (2%), and housewife (8%). In term of household income, the majority of respondents were in the income group 1 - 3 lacs (54%), while the second highest group was 3 - 6 lacs (34%).

TABLE 2: PROFILE OF RESPONDENTS

Characteristics	Frequency	Percentage (%)
Gender:		
Male	43	86
Female	7	14
Age:		
20 – 30	13	26
30 – 40	20	40
40 – 50	11	22
Above 50	6	12
Highest level of Education:		
Graduate	28	56
Post graduate	13	26
Highschool	2	4
Intermediate	7	14
Occupation:		
Govt. Employee	10	20
Lawyer	1	2
Businessman/Self employed	22	44
Pvt. Job	12	24
Housewife	4	8
Others(including students)	1	2
Annual Income:		
1 – 3 lacs	27	54
3 – 6 lacs	17	34
6 – 9 lacs	2	4
Above 9 lacs	0	0
None	4	8
City:		
Lucknow	48	96
Kanpur	2	4

TABLE SHOWING COMPANY CHOSEN

Name of insurance company:	Frequency	Percentage (%)
1. LIC	35	70
2. ICICI Prudential	4	8
3. Bajaj Allianz	2	4
4. Tata AIG	1	2
5. Max Newyork	4	8
6. Birla Sunlife	3	6
7. Others	1	2

The result showed that the majority of the respondents choose LIC (70%), followed by ICICI Prudential & Max Newyork in same percentage (8%), Birla Sunlife (6%), Bajaj Allianz (4%), Tata AIG & others (2%).

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GAP MODEL

THE ACTUAL AND DESIRE SERVICE QUALITY

This section presents the finding of the actual (Perception) and desire (expectation) on service quality of five dimensions based on SERVQUAL model.

THE PERCEPTION AND EXPECTATION ON TANGIBLES

TABLE 3: MEANS OF PERCEPTION AND EXPECTATION ON TANGIBLES

Attributes	Customers' Perception	Customers' Expectation	Gap
1. Moderns of office Surroundings	3.14	3.54	0.40
2. Moderns of Physical facilities	3.34	3.64	0.30

Table 3 illustrates the mean score of attributes in tangible dimension in term of perception and expectation. In term of expectation, attribute 1 or 'moderns of office surroundings' scores highest attribute 2 or 'Moderns of Physical facilities' scores lowest. The attribute 2 scores highest on perception and the attribute 1 lowest on perception.

THE PERCEPTION AND EXPECTATION ON RELIABILITY

TABLE 4: MEANS OF PERCEPTION AND EXPECTATION ON RELIABILITY

Attributes	Customers' Perception	Customers' Expectation	Gap
1. Eagerness of employees is same before & after getting insured	3.38	3.68	0.30
2. Employees show a sincere interest in solving the problem.	4.32	4.98	0.66
3. Feel safe in premiums with the insurance company	3.98	4.20	0.22
4. Claim settlement process is transparent & there are no hassles.	3.34	4.06	0.72
5. Get a complete peace of mind after getting insured.	4.48	4.72	0.24
6. Satisfied with the service received from the insurance provider.	4.14	4.78	0.64
7. Delighted with the service received from the insurance provider.	3.30	4.70	1.4

As shown in table 4, the highest score on expectation is on attribute 2 or 'Employees show a sincere interest in solving the problem' and the lowest is attribute 1 which refer to 'Eagerness of employees is same before & after getting insured'. In terms of perception, the attributes 5 or 'Get a complete peace of mind after getting insured' score highest and attribute 1 which refers to 'Delighted with the service received from the insurance provider' scores lowest. It shows that customer perceived that they get a complete peace of mind after getting insured.

A recognizable gap exists between perception and expectation and the highest gap is on attribute 7 or 'Delighted with the service received from the insurance provider' It Means that customers are not delighted with the service received from the insurance provider or their company; this may happen due to many reasons.

The result indicates that those issues most highly correlated with overall satisfaction involved problem or compliant management. Attribute 2 or 'Feel safe in premiums with the insurance company' indicates small gap between customers' perception and expectation. It implies that the customers' feel safe in paying their premium & they understand that their money is in good hands.

THE PERCEPTION AND EXPECTATION ON RESPONSIVENESS

TABLE 5: MEANS OF PERCEPTION AND EXPECTATION ON RESPONSIVENESS

Attributes	Customers' Perception	Customers' Expectation	Gap
1. Information about the new plans/initiatives by the employees	3.96	4.10	0.14
2. Employees are never too busy to respond to the customers' request	3.70	4.14	0.44
3. Employees give their customer short waiting time or fast service turnaround	3.80	4.18	0.38

As illustrated in Table 5, attribute 3 or 'Employees give their customer short waiting time or fast service turnaround' score highest on expectation. There is a recognizable gap on attribute 2 or 'Employees are never too busy to respond to the customers' request' between perception and expectation which summarizes that employees are busy enough to respond to the customers' request or problem. On attribute 3 or 'Employees give their customer short waiting time or fast service turnaround' also shows a distinguished gap between perception & expectation, this shows that many insurance companies are not performing as fast service during transaction.

THE PERCEPTION AND EXPECTATION ON ASSURANCE

TABLE 6: MEANS OF PERCEPTION AND EXPECTATION ON ASSURANCE

Attributes	Customers' Perception	Customers' Expectation	Gap
1. Employees are courteous & offer the personal attention	3.72	4.00	0.28
2. Behavior of employees helps in taking decision	3.70	3.98	0.28
3. Employees are true to their words & never conceal the facts	3.68	4.22	0.54

Table 6 illustrates the mean scores of three attributes selected in assurance dimension in term of perception and expectation. The huge gap exists between perception and expectation and the highest gap is on attribute 3 which is 'Employees are true to their words & never conceal the facts'. Trustworthiness and honesty is considered important qualitative attribute because the transaction are deals with money. The customers need employees who are honest and skilled to handle their transactions and who do not hide the facts.

A recognizable gap can also be found in attribute 2 or 'Behavior of employees helps in taking decision', which shows that customers belief that employees are less experienced & skilled in helping. Factor that considered important is employees have the knowledge and experience to help in taking decision. In terms of expectation, customers expect high on employee trustworthiness & loyalty because it is important in transaction efficiency.

THE PERCEPTION AND EXPECTATION ON EMPATHY

TABLE 7: MEANS OF PERCEPTION AND EXPECTATION ON EMPATHY

Attributes	Customers' Perception	Customers' Expectation	Gap
1. Company has convenient branch locations	3.90	4.30	0.40
2. Company has 24X7 customer support service	3.88	4.30	0.42
3. Company has wide range of plans	3.90	4.18	0.28
4. Customers get the same service as shown in the advertisements in TV & newspapers	3.64	3.96	0.32
5. Premium paying options are flexible & convenient	3.88	4.16	0.28

As shown in Table 6, a distinguished gap exist between perception and expectation and the highest gap is on attribute 2 or 'Company has 24X7 customer support service'. It proves that employees did not get 24X7 customer support service; this may be due to the lack of monetary funds on the part of company. The highest score on perception is attribute 3 or 'Company has wide range of plans' & attribute 1 or 'Company has convenient branch locations' and the lowest is attribute 4 or 'Customers get the same service as shown in the advertisements in TV & newspapers'. It shows that customer perceived that company has wide range of plans but they do not get the same service as shown in TV & advertisements. Regarding empathy dimension, the important issues are customers' need 24X7

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customer support service from employees, and insurance service counter personnel should handle and offer services that indicate good quality of service. Attribute 3 which describes that company has wide range of plans indicates small gap between perception and expectation. It implies that the companies usually have wide range of plans according to customers' need.

CONCLUSION AND FINDINGS BASED ON GAP MODEL

After studying the mean of perception & expectation of the different attributes in the five factors viz. Tangibles, Reliability, Responsiveness, Assurance, Empathy; we conclude that the maximum gap exist in the Reliability factor. In reliability factor most of the attributes show a distinguished gap between perception & expectation. Usually the expectations of a customer are high and when it comes to the service quality of any company (here insurance provider), they always demand more.

In the present context it is clearly visible that the customers are less satisfied and delighted with the service of the insurance provider as the gap is very high. In terms of tangibles the gap between the perception and the expectation is very less, this shows that customers perceive good infrastructure facilities from the insurance provider which are modern and up to date. The moderns of the office surroundings and physical facilities do not contribute much to the service quality offered by the insurance provider and most of the companies are maintaining their offices & branch locations with modern technological facilities. In present scenario, top management in the insurance sector should realize that the industry is moving towards a dramatic era. In this ever-changing competitive market, insurance companies have to use their efforts to expand their market in facing their competitors. The study aims at maximizing the reliability factor for insurance sector, as to give customers better service and to earn maximum profit.

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IMPACT OF REFORMS ON CAPITAL ADEQUACY REQUIREMENTS OF INDIAN BANKS

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ABSTRACT

In this paper, an attempt is made to analyze the impact of reforms on the capital adequacy requirements of Indian Banks, which is divided into four sections. First section includes a brief review of the earlier studies. Second section covers the objectives, hypotheses and research methodology. In third section, an attempt is made to analyze the impact of reforms on the capital adequacy requirements of the Indian banks. To achieve the objectives of the study, the use is made of secondary data collected from the various sources like Report on Trends and Progress of Banking in India, Indian Banking Year Book, Performance Highlights of Public, Private and Foreign Banks in India, various journals such RBI Bulletin, IBA Bulletin, Professional Banker, Chartered Financial Analyst, ICFAI Journal of Bank Management and various websites. To test the statistical significance, ANOVA technique is used. The analysis clearly shows capital adequacy ratio has shown a significant improvement over the years in all the groups of the banks and is above the stipulated level {internationally accepted standard of 8 per cent and Indian standard of 9 per cent} during the period under study. But effective cost management, recovery management, technological intensity of banking, governance and risk management, financial inclusion are the areas, which will have a key bearing on the ability of Indian banks to remain competitive and enhance soundness. In this paradigm, improvement in policy framework, regulatory regime, market-perceptions and indeed, popular sentiments relating to governance in banks need to be on the top of the agenda to serve the society's needs and realities while being in harmony with the global perspective.

KEYWORDS

Liberalization, Capital Adequacy Ratio (CAR), Financial Inclusion, Market perceptions, Risk Management.

INTRODUCTION

After the set back of early nineties when the Government of India had to pledge the gold to acquire foreign currency to meet the severe problem of balance of payment temporarily, the Government planned to liberalize the Indian economy and open its door to the foreigners to speed up the development process as a long-term solution for the ailing economy. The economic liberalization move, which was initiated in 1991 when the new government assumed office, has touched all the spheres of national activity. Perhaps one area where the deregulatory policies had the maximum impact was the banking sector.

Until 1991, the banking in India was largely traditional. The bankers were prudent and cautious people who seldom took risks and were content with the normal banking activities i.e. accepting of deposits and lending against them. Labeled as "Agents of Social Change", their outlook was rigidly controlled by the policies of the Government, which were centered more on the alleviation of poverty and the upliftment of the downtrodden. The 1969 and 1980's nationalization of banks, bringing private banks under the state control, had the objective of realizing this government dream. Even as late as 1991-92, the profitability was a forbidden word in banking business. The banks were established to fulfill social objectives and their performance was evaluated on their 'task fulfillment' initiatives. Lending to the priority sectors, opening of rural branches, achievements in the implementation of Government sponsored schemes and adherence to the policies and programmes of the Government were the parameters considered for judging the performance of a bank.

Indian banking system has made commendable progress in extending its geographical spread and functional reach. The nationalization of banks helped in increasing the number of branches, volume of deposits and ensured wider dispersal of the advances. Despite impressive quantitative achievements in resource mobilization and in extending the credit reach, some deficiencies have, over the years, crept into the financial system such as decline in the productivity and efficiency of the system, erosion of the profitability of the system, directed lending played a critical role in depressing the profits, the directed investments in the form of SLR and CRR hindered income earning capability and potentials, portfolio quality suffered due to political and administrative interference in credit decision-making, increase in cost structure due to technological backwardness, average ratio of capital funds to RWAs remained low which created problems in international operations and the system remained de-linked from sound international banking practices.

Realizing all these ill effects, the efforts were made to bring reforms in the financial system of the country. The seed of the reforms in India were sown by the Narasimham Committee appointed by the RBI under the chairmanship of M. Narasimham, the former Governor of RBI, to examine the aspects relating to the structure, organization, functions and procedures of the financial system and suggest remedial measures. The Committee submitted its reports in November 1991 and thus, began a new chapter in Indian banking. The financial system reforms were based on twin principles of operational flexibility and functional autonomy so as to enhance the efficiency, productivity and profitability of the financial institutions continuously. It aimed at providing a diversified, efficient and competitive financial system with ultimate objective of improving the efficiency of available resources, increasing the return on investments in promoting an accelerated growth of the real sector of the economy. The specific goals of the reforms were the development of transparent and efficient capital and money markets, promotion of competition through free entry/exit in financial sector, improvement in access of financial savings, improvement of financial health of banks by recapitalizing, restructuring etc. of weaker banks, improvement in the level of managerial competence and quality of human resources, and building up financial institutions and infrastructure relating to supervision, audit, technology and legal framework.

Induced by the forgoing revelations, an attempt is made to analyze the impact of reforms on the capital adequacy requirements of Indian Banking, which is divided into four sections. First section includes a brief review of the earlier studies. Second section covers the objectives, hypotheses and research methodology. In third section, an attempt is made to analyze the impact of reforms on the capital adequacy requirements of Indian banks. Fifth section presents the conclusions and policy implications of the study.

REVIEW OF LITERATURE

The articles published on different facets of Indian banking reforms are restrictive in nature and have been found wanting in terms of the assessment of the impact of the reforms. A brief review of some of them is as follows:

Reddy and Yuvaraja (2001) viewed that financial sector reforms cover every sector of the economy. The adoption of international capital adequacy and accounting standards, deregulation of interest rates and entry of private and foreign banks underline that the speed of the financial sector reforms and sequencing of the reforms should take into account the realities of the Indian economy.

Patra (2002) suggested that several fundamentals must come together in order to make the Indian banking system stronger, efficient and low cost like strengthening of prudential norms and market discipline; adoption of international benchmarks as appropriate to the Indian situation; management of organizational change and consolidation within the financial system; and human resource development as the catalyst of the transformation.

Rao (2002) concluded that the Indian banking system has transformed itself from banking to the international banking. Regulations are forcing the banks to adopt better operational strategies and upgrade their skills. The system requires a combination of new technologies, well-guarded risk and credit appraisal,

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treasury management, product diversification, internal control, external regulation as well as skilled human resources to achieve the heights of the international excellence to play its role critically in meeting the global challenges.

Reddy and Reddy (2003) are of the view that the new challenges faced by the banks are forcing to attempt all new things with the same old rigid structure and system. What required is more managerial and administrative freedom to the management with commensurate and result oriented accountabilities. They stressed that the banks should move towards professional banking with requisite freedom to operate freely in the market within the regulatory and prudential framework prescribed by the RBI.

Muniappan (2003) focused on two areas - firstly, challenges faced by the banks and secondly, the management of these challenges. Every aspect of the functioning of the banking industry, be it profitability, NPA management, customer service, risk management, HRD, etc. has to undergo the process of transformation of aligning with the international best practices. He concluded that the future of Indian banking system needs a long term strategy, which would broadly cover areas like structural aspects, business strategies, prudential control systems, integration of markets technology issues, credit delivery mechanism, information sharing, etc.

Aggarwal and Sharma (2005) analyzed the existing banking environment and suggested the strategies to build up a more strong and vibrant banking system. They stated that the evolution of banking sector in India is likely to take the form of emergence of universal or quasi-universal banks and therefore, risk management and development of an appropriate regulatory system will remain the main challenge to be faced by the banking industry in future.

Ghosh and Das (2005) focused on whether, and to what extent, governments should impose capital adequacy requirements on banks, or alternately, whether market forces could also ensure the stability of banking systems. The study contributes to this debate by showing how market forces may motivate banks to select high capital adequacy ratios as a means of lowering their borrowing costs. Empirical tests for the Indian public sector banks during the 1990s demonstrate that better capitalised banks experienced lower borrowing costs.

Arora and Kaur (2006) stated that banking sector in India has given a positive and encouraging response to the financial sector reforms. Entry of new private banks and foreign banks has shaken up public sector banks to competition. Changing financial scenario has opened up opportunities for the banks to expand their global presence through self expansion, strategic alliances, etc. Banks are diverting their focus on retail banking so as to attain access to low cost funds and to expand into relatively untapped potential growth area.

Sinha (2006) considered the three alternative paradigms - values at risk, expected shortfall and expected excess loss, which may be used to determine the regulatory capital. Furthermore, it outlined the Indian banking scenario in respect of capital adequacy for the period 1996-97 to 2002-03. The results also showed that Tier-I capital of Indian commercial banks is positively related to operating efficiency and has negative relationship with NPA ratio. But no definite relationship between the CAR and bank size could be determined from the analysis.

Mandira and Yuko (2007) presented an analytical review of the capital adequacy regime and the present state of capital to risk-weighted asset ratio (CRAR) of the banking sector in India. In the regime of Basel I, Indian banking system is performing reasonably well, with an average CRAR of about 12 per cent, which is higher than the internationally accepted level of 8 per cent as well as India's own minimum regulatory requirement of 9 per cent.

Thiagarajan, Ayyappan and Ramachandran (2011) analyzed the role of market discipline on the behaviour of commercial banks with respect to their capital adequacy. The study showed that the Capital Adequacy Ratio (CAR) in the Indian Commercial Banking sector shows that the commercial banks are well capitalized and the ratio is well over the regulatory minimum requirement. The private sector banks show a higher percentage of Tier-I capital over the public sector banks. However the public sector banks show a higher level of Tier-II capital. The study indicates that market forces influence the banks' behaviour to keep their capital adequacy well above the regulatory norms. The NPAs significantly influenced the cost of deposits for both public and private sector banks. The return on equity had a significant positive influence on the cost of deposits for private sector banks. The public sector banks can reduce the cost of deposits by increasing their Tier-I capital.

OBJECTIVES, HYPOTHESES AND RESEARCH METHODOLOGY

OBJECTIVES OF THE STUDY
The present study is conducted to examine the impact of reforms on the group-wise/year-wise capital adequacy requirements of the public, private and foreign banks in India during the period 1997-98 to 2010-11.

RESEARCH HYPOTHESES
To achieve the above objective of the study, the following hypotheses are formulated and tested:

H0:   There is no significant difference in the group-wise/year-wise capital adequacy ratio of public, private and foreign banks in India.

Ha: There is a significant difference in the group-wise/year-wise capital adequacy ratio of public, private and foreign banks in India.

RESEARCH METHODOLOGY
To achieve the objectives of the study, the use is made of secondary data collected from the various sources like Report on Trends and Progress of Banking in India, Indian Banking Year Book, Performance Highlights of Public, Private and Foreign Banks in India, various journals such RBI Bulletin, IBA Bulletin, Professional Banker, Chartered Financial Analyst, ICFAI Journal of Bank Management and various websites. To test the statistical significance, ANOVA technique is used.

IMPACT OF REFORMS ON CAPITAL ADEQUACY REQIREMENTS
The question of building up adequate level of capital and resources in PSBs did not receive enough attention in the past. The Government ownership of the banks, commanding about 90 percent of the business, was considered adequate for maintaining public confidence. The level of international banking business was also limited and there was little pressure to conform to the international norms. More importantly, with low level of profits, the banks could not plough back adequate resources to shore up their net worth. As far back as 1961, the RBI had advised the banks to aim at a ratio of 6 percent of paid-up capital and reserves to total deposits because banks had been increasing their assets without a corresponding augmentation of their capital base. The ratio had declined from 9 percent in 1950 to 4 percent in 1960 and further to 1.5 percent by 1978 (for PSBs). Since income was recognized on accrual basis rather than on actual recovery of cash and banks were not required to make sufficient provisions for non-performing loans (the system of classifying advances as per health code was itself subjective), the actually deteriorating financial health of banks did not get reflected in banks' balance-sheets. In addition, the recession in the industrial sector increased industrial sickness, which added to the burden on the financial sector. It was only after the introduction of prudential and accounting norms in 1992-93 following the Ghosh Committee recommendations did the losses show up clearly on banks' balance sheets. By 1992-93, 20 nationalized banks (now 19 after the merger of NEWBK with PNB in 1993-94) reported combined losses of Rs.3648.92 crore with equity nearly being wiped out or becoming negative in case of several banks. Against this, the Government accepted the Narasimham Committee recommendations for adoption of the BIS norms on capital adequacy to improve the financial health of the banks and enable them to compete both at home and abroad. The RBI introduced the norms in a phased manner from April 1992, covering all banks (PSBs, PSIBs and FBs) by March 1996.

The Committee on Banking Regulations and Supervisory Practices (Basel Committee or Basel-I) in July 1988 released a framework on international convergence of capital measure and capital standards. The fundamental objectives that underline the Committee's work on capital convergence were: firstly, that the new framework shall serve to strengthen the soundness and stability of the banking system, and secondly, the framework shall be fair and for a high degree of consistency in its application to banks in different countries with a view to ensure equality among the international banks. The Basle Committee has defines capital in two tiers: Tier-I and Tier-II. Tier-I capital, otherwise known as core capital, provides the most permanent and rapidly available support to a bank against unexpected losses, whereas Tier-II capital contains elements that are less permanent in nature or less rapidly available.

In order to strengthen the capital base of Indian banks, RBI introduced in April 1992, a system of assigning risk weights for different kinds of assets and relating capital strength to Risk Weighted Assets (RWA) of commercial banks. Capital Adequacy Ratio is defined as ratio of Capital Funds to Risk Weighted Assets. It was stipulated that all the Indian banks with international presence should the achieve Capital Adequacy Ratio (CAR) of 8 percent by 31st March, 1994 (later extended to 31st March, 1995), foreign banks by 31st March 1993, other banks to achieve 4 percent by 31st March, 1993 and 8 percent by 31st March, 1996. Although it only

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addressed credit risk, it reflected the thinking that the amount of the capital required to protect against loses in an asset should vary depending upon the riskiness of the asset. In 1996, market risk was added as an area for which capital was required.

The banking industry has changed in many ways since the implementation of Basel-I in 1988. Two specific changes - the expanded use of securitization and derivatives in secondary markets, and vastly improved risk-management systems had significant implications for Basel-I. It has been criticized to be a "one size fits all" model, lacking in sophisticated measurement and management of risks. The capital regime recommended by Basel-I could not keep pace with either due to the complex nature of the operations of the large banks or the substantial changes in both the concepts and technology of risk management. It has also been criticized as being inflexible due to its focus on primarily credit risk, ignoring market risk and operational risk and treating all types of borrowers under one risk category regardless of credit worthiness.

From 1993-2003, the government for the purpose of recapitalization pumped Rs. 20446.12 crores, which is an indication of the extent of capital erosion faced by the banks in post reforms period. The experience of bank recapitalization in several parts of the world has demonstrated that the exercise of recapitalization does not necessarily prevent banks from getting into trouble again. Recapitalization of weak banks using public money is also a costly and unsustainable option in view of the increasing strains on the government exchequer. The State Bank of India Act 1955 was amended to enhance the scope of the provision for partial private shareholding. The Banking Companies (Acquisition and Transfer of Undertakings) Acts 1970/1980 have also been amended in order to enable the public to subscribe to the capital of nationalized banks to 49 per cent of their total capital. The Governments' decision to reduce its equity stake in PSBs to 33 percent while retaining the public sector characteristics is an enabling provision for the banks to access the capital market in case of need. Therefore, the issues arise how much should be the adequate capital? Having achieved the capital adequacy ratio, will the PSBs, especially the nationalized banks, be able to sustain it? Should all the banks hold the same level of capital or should the weaker banks be asked to hold more? Moreover, in focusing too narrowly on capital alone as a measure of banks' health, there is a danger of overlooking other important aspects of banks' well being. Therefore, capital should be regarded as a part of overall risk management and there is a need to evolve a single measure that will help the banks to judge the right amount of capital to cover all the risks being faced by the banks.

The Basel Committee on Banking Supervision (BCBS) released the New Basel Capital Accord (Basel-II) in July 2003, applicable to all member countries from January 1, 2007 including India, which aims to ensure effective risk management and security systems in the financial sector with a greater emphasis in banks. The improved capital adequacy framework is more intended towards fostering a strong emphasis on risk management and encouraging ongoing improvements in the risk assessment capabilities of a bank. The framework of Basel II can be viewed from a three-pillar format. The fist pillar is compatible with the credit risk, market risk and operational risk. The minimum regulatory capital (MRC) focused on these three risks. The second pillar gives the bank responsibility to exercise best ways to manage the risk specific to that bank. The third pillar emphasize on market discipline for greater transparency, disclosure and encouraging best international practices.

The primary objective of Basel-II is to introduce greater risk sensitivity into the calculation of the amount of capital that a bank needs to hold. The revised Accord has retained the current definition of capital i.e. Tier-I, Tier-II and Tier-III capital. Tier-I Capital (Core Capital) include Paid up capital, Disclosed free reserves (statutory reserves, share premium, other revenue reserves), Capital reserve (surplus from sale of capital assets) and unallocated surplus (P & L balance carried over). Tier-II Capital include Undisclosed reserves and cumulative perpetual preference shares, Revaluation reserves (at discount of 55 percent), Investment fluctuation reserve, General provisions and loss reserves (up to a maximum of 1.25 percent risk weight assets), Hybrid debt capital instruments and Subordinated debt (maturity of above 5 years, fully paid-up, unsecured, subordinate to claims of other creditors, not redeemable at the initiative of the holder or without the consent of RBI). Tier-I capital should not be less than 50 percent of total capital. Tier-II capital cannot exceed 100 percent of Tier-I capital. Investment by banks in the subordinated debt of other banks should not exceed 10 percent of a bank's capital funds and will carry 100 percent risk weight. Tier-III Capital has the same characteristics of subordinated debt as in Tier-II Capital except for original maturity of at least two years and lock in clause i.e. no repayment if bank fails in its minimum capital requirement. Tier-III capital is limited to 250 percent of Tier-I capital. Unused Tier-I capital may be substituted for Tier-III up to the limit of 250 percent.

The Minimum Regulatory Capital (MRC) is set by the Capital Ratio which is defined as "(Total Capital -Tier-I + Tier-II + Tier-III)/(Credit Risk + Market Risk + Operational Risk)". Basel-I provided for only a credit risk charge. A market risk charge was implemented in 1996. The Committee has proposed operational risk capital of 12 per cent of minimum regulatory capital is provided i.e., MRC will be 9 per cent + 12 per cent of 9 per cent i.e. 10.08 per cent. In this ratio, the denominator represents the bank's assets weighted according to the three separate types of risk: *Credit Risk* - the risk of loss to the bank due to failure of borrowers/ counter-parties in meeting their commitments, *Market Risk* - the risk associated with market fluctuations in instruments such as futures, options, foreign exchange, etc. and *Operational Risk* - the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events.

TABLE 1: BANK GROUP-WISE CAPITAL TO RISK WEIGHTED ASSETS RATIO

Years	SBI Group	Nationalized	PSBs	Old PSIBs	New PSIBs	FBs	SCBs
1997-98	14.0	10.3	11.6	12.3	13.2	10.3	11.5
1998-99	12.3	10.3	11.3	12.1	11.8	10.8	11.3
1999-00	11.6	10.1	10.7	12.4	13.4	11.9	11.1
2000-01	12.7	10.2	11.2	11.9	11.5	12.6	11.4
2001-02	13.3	10.9	11.8	12.5	12.3	12.9	12.0
2002-03	13.4	12.2	12.6	12.8	11.3	15.2	12.7
2003-04	13.4	13.1	13.2	13.7	10.2	15.0	12.9
2004-05	12.4	13.2	12.9	12.5	12.1	14.0	12.8
2005-06	12.3	12.2	12.2	11.7	12.6	13.0	12.3
2006-07	12.3	12.4	12.4	12.1	12.0	12.4	12.3
2007-08	13.2	12.1	12.5	14.1	14.4	13.1	13.0
2008-09	12.7	12.1	12.3	14.3	15.1	15.1	13.2
2009-10	12.1	12.1	12.1	13.8	17.3	18.1	13.6
2010-11	11.0	12.1	11.8	13.3	15.5	17.7	13.0

Anova Value (F-ratio): Bank group-wise: 2.75 (significant at 5% level), Year-wise: 3.45 (significant at 5% level).

Source: Compiled from Performance Highlights of Various Banks, IBA, Mumbai.

Table clearly shows that the ratio of capital to risk weighted assets increased from 11.5 per cent (1997-98) to 13.0 per cent (2010-11) in scheduled commercial banks in India, which is above the internationally accepted standards and registering a rising trend during this period except last year in which a slight decline is observed. But this ratio is higher in new private sector Indian banks (PSIBs) and foreign banks (FBs) than the public sector banks (PSBs) and old private sector Indian banks (Old PSIBs). The ratio increased from 10.3 to 12.1 in nationalized banks, from 11.6 to 12.1 in public sector banks, from 12.3 to 13.3 in old private sector Indian banks, from 13.2 to 15.5 in new private sector Indian banks, from 10.3 to 17.7 in foreign banks during the period of 1997-98 to 2010-11. However in SBI group, this ratio decreased from 14.0 to 11.0 during the same period. Bank group-wise calculated F-ratio (2.91) is greater than critical ratio (2.34) and likewise, year-wise calculated F ratio (2.53) is greater than the critical ratio (1.90) at 5 per cent level of significance. *Therefore, the null hypothesis that there is no significant difference in group-wise/year-wise ratio of capital to risk weighted assets in public, private and foreign banks can't be accepted.*

In view of the financial crisis at the international level, the issues still exist, i.e. Having achieved the capital adequacy ratio, will the PSBs, especially the nationalized banks, be able to sustain in the new regime? Should all the banks hold the same level of capital or should the weaker banks be asked to hold more? These issues clearly show that there is a need of third generation reforms in Indian banking to face the challenges of crisis at the international level.

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CONCLUSIONS AND POLICY IMPLICATIONS

Capital adequacy ratio has shown a significant improvement over the years in all the groups of the banks and is above the stipulated level {internationally accepted standard of 8 per cent and Indian standard of 9 per cent} during the period under study. Therefore, it can be concluded that banking reforms have indeed transformed Indian banks into strong, stable and prosperous entities with an adequate capital base. But effective cost management, recovery management, technological intensity of banking, governance and risk management, financial inclusion are the areas, which will have a key bearing on the ability of Indian banks to remain competitive and enhance soundness. In this paradigm, improvement in policy framework, regulatory regime, market-perceptions and indeed, popular sentiments relating to governance in banks need to be on the top of the agenda to serve the society's needs and realities while being in harmony with the global perspective.

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UNDERSTANDING THE EFFECT OF ENVIRONMENT FRIENDLY TECHNOLOGY USAGE ON CONSUMER PURCHASING PREFERENCES IN KOLKATA CITY

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ABSTRACT

Interest in developing and using environment friendly, or "green," technology in production process is on the increase. Consequentially use of environment friendly technology as a marketing device is growing. Consumer attitudes towards environmental issues may influence their purchasing patterns and decisions, as well as they may be willing to pay premium prices for products that incorporate green technology. To see if a higher level of concern for environmental issues influences purchasing behavior, a survey of seventy people was conducted in the city of Kolkata. Respondents reported on their concern and awareness levels, their purchasing habits and patterns, and their willingness to pay more for greener products or for products which were relatively more friendlier to environmental concerns. Higher concern-level respondents were found to have a higher frequency of green purchasing behavior, as well as a greater willingness to pay more for green product.

KEY WORDS
Consumer Purchase Pattern, Green technology.

CONSUMER ATTITUDE AND BEHAVIOUR TOWARDS GREEN TECHNOLOGY

GREEN TECHNOLOGY
In the technology driven industry, green technology involves manufacturers finding ways to "reduce the resources they consume and the waste they generate, and . . . to make their products more recyclable" (Goldberg, 1998, p. 16). Many of these same technologies can be applied to the manufacture, use, and disposal of cellular phones. For example, mobile giant Nokia uses components that self-disassemble under heat, and incorporates features in its chargers that indicate when a phone is charged so that users can disconnect the charger from the electrical source. The question is whether these environmentally friendly, or green, features have any influence over consumers' purchasing decisions.

Although environmental protection has been an important issue for many years, how awareness of environmental issues affects consumer purchasing decisions has not been examined in much depth until relatively recently. Due to the growing public concern over such environmental issues as global warming, some firms are investing in concepts such as green technology (Meyers, 2007) and researchers and marketers are now beginning to look into how to measure the affect of green labeling on purchasing decisions (Beck, 2007). Still, it is not clear how powerful an influence the use of green technology has on these decisions.

In their literature review, Saphores *et al*. (2007) point out that consumers make trade offs in their purchasing decisions, including whether or not they are willing to pay extra for "green" products (p. 115). Their study of California households (Saphores *et al*., 2007) found that consumers are willing to pay only one to five percent more for green electronics than for equivalent non-green products (p. 115). Bang, *et al*. (2000), found a relationship between consumers willingness to pay more for renewable, "green," energy and their knowledge, beliefs, and concern over environmental issues; however, while their level of concern for the environment was high, their level of knowledge was often limited, leaving marketers, as well as government agencies interested in pursuing environmentally friendly policies, with the task of educating the public (p. 466). On the other hand, Laroche, *et al*. (2001) found those consumers' levels of environmental knowledge, or "eco literacy," were not good determiners of purchasing behavior, with both those willing and unwilling to pay more for environmentally friendly products having the same eco literacy score (p. 516).

A complication in understanding consumers' behavior is the observation that, despite a majority of Americans reporting that environmental issues are very important to them, skepticism towards manufacturers' claims of environmental friendliness has caused their purchasing behavior to have "lagged behind verbally-expressed concern for the environment" (Mohr, 1998). Research by Lane and Potter (2007) also found what they call "action-attitude gap" in UK residents' decisions in purchasing new cars. Although fuel efficiency is reported as a key factor in making car-purchase decisions, most car buyers put little effort into comparing fuel consumption when making their decisions. Whether due to skepticism or for other reasons, consumers' stated concerns about the environment don't appear to correspond with the purchase decisions they make.

RESEARCH QUESTIONS
Does a consumer's stated level of concern about environmental issues affect his or her decisions whether or not to purchase products with environmentally friendly attributes?

Are consumers with a relatively high level of concern about environmental issues more willing to pay a premium for a higher-priced green product than those with a relatively low level of concern about environmental issues?

HYPOTHESIS 1
Consumers with a relatively high level of concern about environmental issues (greens) are more likely than those with a relatively low level of concern about environmental issues (reds) to purchase products with environmentally friendly attributes.

HYPOTHESIS 2
When given a choice between a higher-priced green product and a less expensive but otherwise equivalent product, consumers with a relatively high level of concern about environmental issues (greens) are more likely than those with a relatively low level of concern about environmental issues (reds) to be willing to pay a premium for the green products.

METHODOLOGY
DESIGN
A survey was employed to examine the hypothesized relationships between environmental concern level and behavior in purchasing green products. The questionnaire was divided into four parts: section 1 was used to gather demographic information about the respondents, section 2 was used to determine the respondents' relative level of environmental concern, sections 3 and 4 were used to determine the respondents' general purchasing behavior in terms of environmentally friendly products, and section 3 was used again to gauge respondents' willingness to pay more for a green product.

After section 1, survey respondents were asked to respond to five questions regarding their level of concern about environmental issues. Each question was given on a five-point Likert scale, with 1 being strongly disagree and 5 being strongly agree. The questions were designed so that a higher mean score indicated a higher level of concern. This was done in order to divide the respondents into two groups: greens (relatively high-level of concern) and reds (relatively low-level of concern).

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Respondents were then asked questions regarding their general purchasing behavior in terms of green product attributes. A Likert scale was employed again, this time based on the frequency of the purchasing behavior in question. The questions were designed so that a higher score indicated a greater propensity towards purchasing green products.

Finally, respondents were given a hypothetical situation in which they have the choice of purchasing a cellular phone that incorporates green technology, or a less-expensive but otherwise equivalent one that does not. They were asked how willing they would be, on a five-point scale (with 1 = not at all willing and 5 = very willing), to pay five percent more for a green phone. This question was also used to calculate the overall mean for purchasing behavior.

PARTICIPANTS

Due to a lack of time and resources, a non-probability convenience sample was chosen to respond to the questionnaire. Participants included friends, associates, and colleagues of the researcher. The research was confined to Kolkata city. A total of 100 questionnaires were distributed, of which 70 were completed and returned.

APPARATUS

The apparatus consisted of the questionnaire (see Appendix A), a computer, and software including Microsoft Excel and PHStat (a statistical analysis program).

DATA COLLECTION PROCEDURE

Surveys were distributed to respondents on a convenience basis, as the time available for selecting a sample was very limited. The researcher utilized the resources that were readily available within the allowable timeframe, including his friends, associates, and colleagues. Surveys were distributed in paper form. It is likely that this sample is not truly representative of a meaningful measurement parameter; however, it may provide valuable insight that could help guide further research.

DATA ANALYSIS

The surveys were gathered and divided into two groups (greens and reds) according to the mean levels of concern as determined by section 1 of the survey. The division was done by means of a median split. Those whose answers to the first group of questions averaged less than or equal to the median were put in the red group (relatively low-level of concern for the environment), while those answering with an average greater than the median were put in the green group (relatively high-level of concern for the environment).

Each group was then analyzed in terms of their past and potential future purchase behavior regarding green products according to their responses to sections 3 and 4 of the survey, and a mean level of propensity to purchase green products for each group was established. In addition, both groups were analyzed to determine a mean level of willingness to pay a five percent premium for a green cellular phone over a less-expensive but otherwise equivalent non-green phone (survey section 4). Each of the means of the last two sections (propensity towards buying green and willingness to pay more for green) were then subjected to t-tests to determine if there was a significant difference between the green and red groups in propensity towards purchasing green products, and in willingness to pay more for a particular green product (cellular phone) over an otherwise equivalent, but non-green product (for details of the statistical analysis, please see Appendix B).

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The results of the statistical analysis of the data confirmed both hypotheses: that there is a relationship between levels of environmental concern and both propensity towards purchasing, and a willingness to pay more for environmentally friendly products. In both cases, a higher level of concern corresponded with a greater degree of present and potential future green purchasing behavior, as well as a greater willingness to pay more for a green product.

Due to possible bias in the selection of the sample, as well as in the formulation of the survey questions and the analysis of the results, these findings cannot be considered conclusive. They do, however, give some indication that a relationship exists between environmental concern and purchasing behavior and willingness to pay a premium for green products.

An interesting result of the survey was that, although responses to concern levels below 4 were placed in the red group (and therefore more than half of the possible mean scores), approximately twice as many of the participants received scores that placed them in the green group. In addition, a number of those in the green group made marginal comments indicating that they felt hypocritical regarding the difference between their stated level of concern and their actual behavior.

Future studies in this area could be pursued to correct for the limitations of the data collection and analysis in this research project. A larger and randomly selected sample would give more weight to the findings, as would improvements in the survey design. Other factors could also be looked at, such as environmental knowledge and skepticism toward green marketing claims. These factors could be analyzed to determine the degree of interaction, if any, and the relative weight each has in influencing consumer behavior. This kind of information could prove useful to firms interested in pursuing green marketing initiatives, as well as to groups interested in educating consumers and/or environmental protection. Limitations of the study and suggestions for future research are discussed.

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APPENDIX

APPENDIX A: SURVEY QUESTIONNAIRE
SURVEY

Thank you for taking the time to complete this survey. There are four sections to the survey: information about yourself, and eleven questions regarding your attitudes toward environmental issues and how you make decisions about purchasing products. Please answer all the questions as honestly as possible. No personally identifiable information will be collected. There is no right or wrong answers, and your responses will remain anonymous. The purpose of this survey is to examine the relationship between people's concern for the environment and their purchasing behavior.

SECTION 1

Before answering the questions, please provide some information about you.

Age _____   Sex_____   Nationality_____

Level of education (please check the highest level that applies):

____High school graduate

____Some College

____College graduate

____Graduate student (M.A. or Ph.D)

____Master's degree

____Doctorate degree

____None of the above

How would you characterize your income level? (Please circle one)

Lower   Middle   High

SECTION 2

Do you agree with the following statements? Answer the following questions by circling the appropriate number. The more you agree, the higher number you should circle (1 = strongly disagree, 5 = strongly agree).

i. Climate change is a serious issue.

1   2   3   4   5

ii. Governments should do more to encourage people to recycle.

1   2   3   4   5

iii. The environment is in danger due to human activity.

1   2   3   4   5

iv. I worry that the next generation will face serious problems regarding the environment.

1   2   3   4   5

v. Global warming is one of the most important issue in the world today.

1   2   3   4   5

SECTION 3

How often do you do the following? Answer the following questions by circling the appropriate number (1 = never, 2 = seldom, 3 = sometimes, 4 = usually, and 5 = always). Remember that your answer should reflect your actual behavior, not your opinion about whether or not you should behave this way.

i. When making a purchase, I seek out information about the product's environmental impact.

1   2   3   4   5

ii. I try to purchase products that can be easily recycled.

1   2   3   4   5

iii. I try to purchase products that are energy efficient.

1   2   3   4   5

iv. I try to purchase products that have minimal packaging.

1   2   3   4   5

v. I try to avoid purchasing products that I know to have a negative effect on the environment.

1   2   3   4   5

SECTION 4

Please answer this question by circling the appropriate number (1 = not willing at all, 5 = very willing).

If you were planning to purchase a new cellular phone, and had to choose between a phone that incorporated environmentally friendly technology (less packaging, easier to recycle, more energy efficient) and an identical phone that did not incorporate environmentally friendly technology, how willing would you be to pay 5% more for the environmentally friendly phone?

1   2   3   4   5

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APPENDIX B: STATISTICAL ANALYSIS

HYPOTHESIS 1

Consumers with a relatively high level of concern about environmental issues (greens) are more likely than those with a relatively low level of concern about environmental issues (reds) to purchase products with environmentally friendly attributes.

DIFFERENCE IN MEANS: GREEN AND RED PURCHASING BEHAVIOR

H_0: $mean_{green} - mean_{red} = 0$; H_a: $mean_{green} - mean_{red} > 0$

Data	
Hypothesized Difference	0
Level of Significance	0.05
Population 1 Sample	
Sample Size	34
Sample Mean	3.56
Sample Standard Deviation	0.8192
Population 2 Sample	
Sample Size	36
Sample Mean	2.86
Sample Standard Deviation	0.8518

Intermediate Calculations	
Population 1 Sample Degrees of Freedom	33
Population 2 Sample Degrees of Freedom	35
Total Degrees of Freedom	68
Pooled Variance	0.699127
Difference in Sample Means	0.7
t Test Statistic	3.500755

Upper-Tail Test	
Upper Critical Value	1.667572
p-Value	.000412
Reject the null hypothesis	

Decision: Reject null hypothesis at α = .05 because the test statistic falls in the rejection region above 1.668.

Conclusion: There is evidence that the mean for the green group is greater than the mean for the red group.

HYPOTHESIS 2

When given a choice between a higher-priced green product and a less expensive but otherwise equivalent product, consumers with a relatively high level of concern about environmental issues (greens) are more likely than those with a relatively low level of concern about environmental issues (reds) to be willing to pay a premium for the green products.

Difference in Means: Green and Red Willingness to Pay More for Green Product

H_0: $mean_{green} - mean_{red} = 0$; H_a: $mean_{green} - mean_{red} > 0$

Data	
Hypothesized Difference	0
Level of Significance	0.05
Population 1 Sample	
Sample Size	34
Sample Mean	4.47
Sample Standard Deviation	0.8611
Population 2 Sample	
Sample Size	36
Sample Mean	3.36
Sample Standard Deviation	1.2684

Intermediate Calculations	
Population 1 Sample Degrees of Freedom	33
Population 2 Sample Degrees of Freedom	35
Total Degrees of Freedom	68
Pooled Variance	1.187921
Difference in Sample Means	1.11
t Test Statistic	4.25864

Upper-Tail Test	
Upper Critical Value	1.667572
p-Value	**3.23E-05**
Reject the null hypothesis	

Decision: Reject null hypothesis at α = .05 because the test statistic falls in the rejection region above 1.668.

Conclusion: There is evidence that the mean for the green group is greater than the mean for the red group.

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