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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

MACHINE USAGE BASED ON PRODUCT MIX IN MANUFACTURING CLASSIFICATIONS

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ABSTRACT

This research elucidates an algorithm for the calculation of optimal product mix and machine utilization for a manufacturing process employing trainee engineers. A study of the important parameters influencing the system performance has also been conducted.

KEYWORDS
Product Mix, Capacity, Time reduction.

INTRODUCTION

The product and process for mass production are characterized by high non-productive time, unavoidable delays and occasional inspections as stated by Hitomi(n.d). Application of group technology consist [trainee engineers] along with process experts environment has been known to offer the advantages of mass production and result into cost reduction. In order to derive maximum benefit of group manufacture it is essential to allocate the technical team based part facilities, to different machines in an optimal manner. Each part family may visit a number of machines but not necessarily all the machines in the system. However, for this situation the amount of effort needed to work out an optimal schedule, for a real life problem, would be quite large. By adopting simpler manufacturing business strategy would comprise of a number of cells with each cell being provided with different number of machines of varied types. One cell would process a particular group of part. A system of this type is shown in Fig. 1:

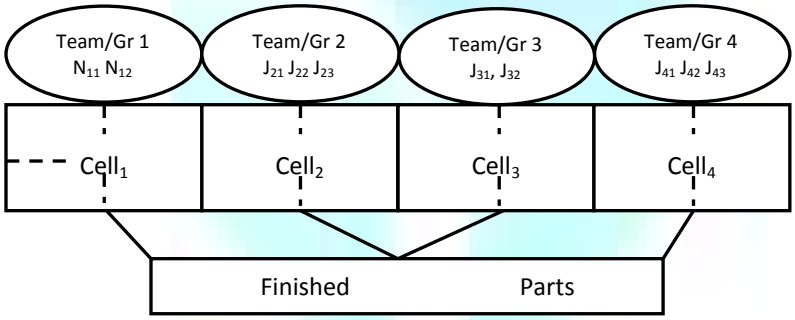


Fig. 1

For the manufacturing system in Fig. 1, the machine loading and product mix decisions are major problems. These problems have been investigated analytically with mathematical programming techniques by Hanssman (1999). From trainee engineer stand point, the production scheduling problem has been investigated by Hitomi and Ham (1978) whereas, Petrov (1977) has dealt with flow type group production planning. PERA (1950) has considered the loading and scheduling of work in a trainee engineers cell. Hitomi (n.d) and Ham (1978) have also developed optimizing algorithm for machine capacity planning and product mix in a single machine and multi stage production systems.
In this paper the authors have presented an efficient computer algorithm for the determination of optimum product-mix and machine-load, in a manufacturing system of the type shown a manufacturing system of the type shown in Fig. 1. for three different conditions.

MODEL FORMULATION

The cells in Fig. 1 comprise of a number of machines of varied types grouped in accordance with the operations necessary for a part family. Each group consists of two or more parts and is processed fully in a single cell. The present work is based on the model of Hitomi et al. (1982) however, the solution methodology and the computer algorithm developed by the authors are more accurate and less tedious to use.

MACHINE LOADING AND PRODUCT-MIX ANALYSIS

The assumptions:

1. The case of a single machine is treated and the total time available on the machine is'd'.
2. Parts to be processed are classified into M groups. The group index is denoted by I (= 1, 2, …… M). In group G_i, N_i parts are included where the part index denoted by J (= 1, 2, … N_i).
3. The group production time consists of group set up time, and sum of job production times for each group.
4. Job-production time is equal to job set-up time, and unit production time multiplied by lot size.
5. All the parts are cylindrical in shape and produced by turning.

It is required to determine the optimal numbers of the kinds of parts to be produced within a limited time available as well as to decide the optimum machining speed for all products so as to maximize the production rate.

(A) Part Manufacturing Time :

The manufacturing time of jth part is ith group is given by eqn.1. The part is machined in a single pass at a constant feed and cost factor, tool life, set time etc. are all deterministic. It is assumed that the Taylors tool life relationship ($VT^n = C$) holds true.

$$Pij(vij) = aij + \frac{\lambda ij}{Vij} + \frac{\lambda ij\ bij}{(Cij)1/nij} Vij\ (\frac{1}{nij} - 1)$$

(for j = 1, 2 … N_1 and i = 1, 2, … M)

Unit production time from above equation when plotted against the cutting speed provides a typical bell shaped curve for which optimal cutting speed is obtained as:

$$Vij\ (t) = \frac{Cij}{\left[\left(\frac{1}{nij} - 1\right) pij\right] nij}$$

When processing J_{ij} in a lot of size J_{ij} the total manufacturing time is given by :

$$Pij = Sij + LijPij(Vij)$$

(for j = 1, 2, … N_i and I = 1, 2, … M)

(B) Manufacturing Cost

The cost of a part can be expressed as a function of machining speed $(V_{ij})^{(c)}$. This cost is given by below equations :

$$qij(Vij) = \alpha aij + \frac{(\alpha + \beta ij)\lambda ij}{Vij} + (\alpha bij) + rij)\frac{Vij\lambda ij}{Cij} 1/nij$$

For j=1,2….Nij and i=1,2…M

Optimal product mix decision is to be based on the fact that optimal amount of part has to be produced within the prescribed delivery period.

ANALYSIS FOR SOLUTION

The solution of eqns. 6-8 has been attempted for three cases

Case I : (Q = d)

For this case all X_{ij}'s are 1 and the objective function assumes the form

$$Z\ max = \sum_{i=1}^{M} \sum_{j=1}^{Ni} \text{lij}$$

The optimal solution is:

$$X\ ij = l\ v\ ij = vij\ (t0$$

(For j=1,2….Ni and j=1,2….M)

Case II : When Q > d

The problem is now replaced by the following 0-1 type linear program. The machining speed is initially set corresponding to maximum production rate. The objective function of CASE 1 i.e. maximized subject to $P_{ij} = P_{ij}^{(t)}$. A heuristic takes into account the selection and rejection criterion. The part with maximum production time including the set up has been considered as a candidate for rejection.

Case III : When Q < d

The unique feasible speed values for machining all the parts are based on the minimization of the total cost with the slack time. Based on this criterion the problem assumes a non-linear nature as below:

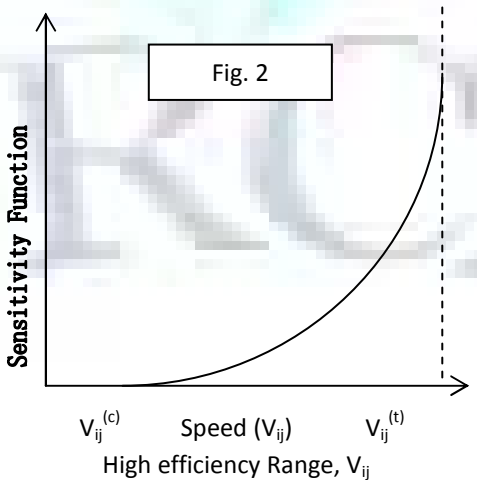
Minimize,

$$Y = \sum_{i=1}^{M} [(\alpha \text{Si} + \sum_{j=1}^{Ni} \alpha\zeta \text{Sij} + \text{LijQij(Vij)}\zeta]$$

The optimal solution, V_{ij}, to this non-linear problem is solved using KUHN-TUCKER conditions . This function is termed 'Efficiency sensitive function'. Properties of this function can be derived with following consideration. At the minimal points, the machining speed for minimum production cost is derived from the conditions.

$$\frac{dpij}{dvij}\left(\text{Vij(t)} = 0 \text{ and } \frac{\text{dvij}}{\text{dvi}}\right| \ ) = 0$$

Exponent, n_{ij} varies between $O<n_{ij}<1$ due to which $(1/n_{ij}^{-1}) > 0$. Also, since $(V_{ij}^{(c)} < V_{ij}^{(t)}$ therefore, from r_{ij} – bij, ij > ^{0} and in the speed range E_{ij} obtained as :



The relationship between sensitivity function and speed is shown in Fig. 2.

RESULTS

The programme has been tested for the data of Hitomi & Ham and the following conclusions have been derived :

1. Proposed procedure is computationally simpler than the branch and bound algorithm of Hitomi & Ham (1978).
2. It is noted (Table 1) that for a_{ji} remaining constant, as b_{ij} increases the rejection increases slowly. The percentage utilization is almost same, nearly 100%.

3. Effect of variation of ratio of tool replacement time and preparation time is given in Table 2.
4. For Q<d, the sensitivity function drops faster with marginal increase in allowable time (Table 3).

CONCLUSIONS

The approach developed to compute the optimal product mix in a GT manufacturing cell is efficient, simpler and takes less computational time. This also offers high machine utilization. It has been observed that the preparation time has maximum influence on the production rate. There is a significant relationship between the optimum value of sensitivity function and allowable time.

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NOMENCLATURE

A_{ij}	Preparation time for part j of group i, min/pc
B_{ij}	Tool-replacement time for part j of group i.
C_{ij}	1 min tool life machining speed for part j of group i.
N_{ij}	Slope constant of the Taylor's tool life equation for part j of group i
P_{ij}	Maximum production rate per unit production time for part j of group i.
S_{ij}	Job set up time for part j of group I, min/lot.
β_{ij}	Machining over head for part j of group i.
λ_{ij}	Machining over head for part j of group i.
1_{ij}	No. of pieces in the lot J_{ij}
G_{ij}	Speed dependent unit production cost (Rs./min)
S_i	Group set up time for the group G_1 (min/group0
V_{ij}	Machining speed for the lot J_{ij} (m/min)
X_{ij}	0-1 variable for G_1
α	Direct Labour cost and overhead (Rs./min)

TABLE 1 : EFFECT OF a_{ij}:b_{ij} OVER PERCENTAGE UTILIZATION AND REJECTION

Ratio a_{ij}:b_{ij}	Rejected PCS	Rejection, %	Allowable time utilization %
1:1	252	41.70	99.89
1:2	270	44.26	99.80
1:3	283	46.39	99.78
1:4	292	47.86	99.62

TABLE 2 : EFFECT OF a_{ij}:b_{ij} OVER PERCENTAGE UTILIZATION AND REJECTION

Ratio a_{ij}:b_{ij}	Rejected PCS	Rejection, %	Allowable time utilization %
1:1	224	36.7	99.78
1:3	348	57.18	99.78
1:5	408	66.88	99.83

TABLE 3: ALLOWABLE TIME VS SENSITIVITY FUNCTIONS

Allowable Time (min)	Optimum Sensitivity function
6,200	66.0
6,300	97.0
6,400	33.5

A STUDY ON THE CHALLENGES FACED BY TIRUPUR GARMENT EXPORTERS

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ABSTRACT

This study highlights the challenges faced by Tirupur garment exporters and its impact on export business, the research shows that the Tirupur knitwear export industry has registered 10-15 per cent growth every year is seeing business down with problems that started almost four years ago, though there are hopes of revival. The problems started in 2007-08 with the rupee appreciating against the dollar. Then, it was losses in Forex derivatives, slowdown in the U.S., closing down of processing units, and now the economic slowdown in the European Union. While all these have had an impact on exports, what worries Tirupur more is that its garments are becoming expensive in the international market. Some of the big overseas buyers have moved out of the Indian knitwear town to Bangladesh in the last two years. Business is estimated to have dropped by nearly 25 per cent.

KEYWORDS
Free Trade Agreement, Preferential Trade Agreement, Tirupur Exporters Association, Apparel Export Promotion Council.

INTRODUCTION

Managing globalization is one of the biggest challenges in Indian garment industry. The Indian garment industry is vital to the economy of the country. It is one of the largest industrial sector in India and a leading foreign exchange earner. The exporters of Indian textile and clothing have grown under the environment of MFA quota for over two decades. The Indian textile and clothing trade is facing a tough competition due to liberalization of trade under WTO. The post quota period commencing 1st Jan 2005, the industry has in an expansionary phase, keen to cut down on flab accumulated by it over the ten years of quota enforcement on India by the developed world. With competition being free- for- all in the post quota phase, the industry has felt the urgent need to cut down on available costs to stay competitive. The Indian garment export industry has shown tremendous potential for growth in the coming few decades.

The first knitwear unit in Tirupur was set up in 1925 and the growth of the industry was slow till late 1930s. A series of strikes in late 1930s in knitting factories in the neighboring towns of Salem and Madurai resulted in the opening of new firms in Tirupur. Subsequently, it emerged as the prominent centre for knitwear in South India by 1940s. In 1942, 34 units were engaged in the production of knitwear all these units were composite mills and the production was carried out in the same unit (sic). There are also references to some units performing specific tasks / operations like bleaching and dyeing, located in the larger units. By 1961, the number of units rose to 230 and till early 1970s, the industry catered only to the domestic market. These units were mostly composite mills without any subcontracting system of production. It was in the 1980s, the export market began to expand and subsequently Tirupur emerged as the largest exporter of cotton knitwear from the country, accounting for roughly 80 percent of the total cotton knitwear exporters.

REVIEW OF LITERATURE

Soundariya Preetha (2012) in her article "Fading fortunes of Tirupur" point out that Wages and dyeing and finishing charges in Tirupur are more than 15 per cent higher compared to Bangladesh, say a couple of leading exporters in the town. A hanger manufacturer hiked the per unit price by Rs.10 recently because of the increasing use of generator sets to tide over the power problem. These are small factors that add to the costs, they point out. Nearly 60 per cent of Tirupur's export supply is to the European Union. With the economic slowdown in the European countries, orders have dropped. Further, Bangladesh has zero duty access to the European Union under the General System of Preferences. This makes Bangladesh goods cheaper by 10 per cent. A large number of international brands say that they are able to get goods at lower prices from other countries, add the exporters.

Sakthivel(2012) in his article "Most Tirupur units limping back to normalcy" pointed out that India first raised its voice of concern when the EU countries' sop was extended to Pakistan as a relief measure to help that country come out of the devastating floods last year," This bilateral move will have a detrimental effect on the Indian textile industry as Pakistan is one of our major competitors.

The signing of FDI and FTA with the EU is expected to be a game changer and hopes to revive this industry back to its original scale. This decision is an enabling policy that will open up new windows of opportunity to modernize the retail sector. The Indian industry will benefit to a great extent once global retailers will start setting up local operations here and sourcing products from local manufacturers.

Sunil Patwari (2013) "Indian textile exporters pin hopes on EU-India FTA" said The textile and garment exporters of India are pinning hopes on Free Trade Agreement (FTA) between the European Union (EU) and India as it is expected to boost their exports to the EU. The EU is a major export market for Indian textile and garment exports. So by signing the EU-India FTA, there will be an increase. "Our neighboring countries such as Pakistan and Bangladesh are enjoying duty-free exports to the EU in yarn, fabric and garments. Once the India EU FTA is in place, we will be able to compete with these countries in exports," he informs. As the production cost of apparels is increasing in China, we expect to receive more export orders from the European Union

OBJECTIVES OF THE STUDY

1. To study in detail about Tirupur garment industry
2. To study the role of AEPC and its impact on garment exporters
3. To analyze the factors which acts as a problem for Tirupur garment exporters
4. To offer suggestions based on the study

METHODOLOGY

The study was conducted by using both primary and secondary data. Primary data were collected through structured questionnaire using convenient random sampling method. The secondary data was collected from various, journals, magazines, news papers and web sites

SAMPLE DESIGN AND SAMPLE SIZE

100 sample units in Tirupur are selected adopting convenient random sampling method

LIMITATIONS OF THE STUDY

- The study was restricted to the particular place only. The study considers the data from Tirupur only
- The sample size was restricted to 100 because of tome factor

DATA ANALYSIS AND INTERPRETATION

PERCENTAGE ANALYSIS

TABLE 1: THE LEVEL OF SATISFACTION WITH OVERALL PERFORMANCE OF AEPC

Particulars	No. of Respondents	Percentage
Highly satisfied	32	32%
Satisfied	38	38%
Neither satisfied nor dissatisfied	10	10%
Dissatisfied	14	14%
Highly dissatisfied	6	6%
Total	100	100

Source: Primary Data

The above table clearly indicates the satisfactory level of exporters on overall performance of AEPC. Out of 100 samples taken for study, 38% of the respondents are satisfied, 32% of the respondents are highly satisfied, 10% of the respondents are neither satisfies nor dissatisfied , 14% of the respondents are dissatisfied and 6% of the respondents are highly dissatisfied.

TABLE 2: THE LEVEL OF SATISFACTION TOWARDS EXPORT PROMOTION POLICIES INITIATED BY GOVERNMENT OF INDIA

Particulars	No. of Respondents	Percentage
Highly satisfied	26	26%
Satisfied	60	60%
Neither satisfied nor dissatisfied	6	6%
Dissatisfied	4	4%
Highly dissatisfied	4	4%
Total	100	100

Source: Primary Data

The above table shows that level of satisfaction towards export promotion policies initiated by government of India. Out of 100 samples taken for study, 26% of the respondents are satisfied, 60% of the respondents are highly satisfied, 6% of the respondents are neither satisfied nor dissatisfied, 4% of the respondents are dissatisfied and 4% of the respondents are highly dissatisfied.

Ho: There is no significant relationship between the experience in export business and level of satisfaction towards export promotion policies initiated by government of India.

TABLE 3: SHOWING THE EXPERIENCE IN EXPORT BUSINESS & LEVEL OF SATISFACTION TOWARDS EXPORT PROMOTION POLICIES INITIATED BY GOVERNMENT OF INDIA

Experience in export business	Level of satisfaction towards export promotion policies						
	Highly Satisfied	Satisfied	Neither satisfied/dissatisfied	Dissatisfied	Highly dissatisfied	Total	chi -square
Less than 5 years	1	8	2	0	2	**13**	**Degree of freedom=12**
5-10 years	23	15	3	3	0	**44**	**Level of significance=0.05**
10-15 years	0	14	0	0	0	**14**	**Table value=21.026**
Above 15 years	2	23	1	1	2	**29**	**Calculated value=1105.53**
Total	**26**	**60**	**6**	**4**	**4**	**100**	

It is found from the above table the table value is less than calculated value at 12 Degree of Freedom. Hypothesis is rejected. Hence it is conclude that there is a significant relationship between the experience in export business and level of satisfaction towards export promotion policies initiated by government of India.

Ho: There is no significant relationship between the experience in export business and level of satisfaction towards overall performance of TEA.

TABLE4: SHOWING THE EXPERIENCE IN EXPORT BUSINESS AND LEVEL OF SATISFACTION TOWARDS OVERALL PERFORMANCE OF TEA

experience in export business	Level of satisfaction towards overall performance of TEA						
	Highly Satisfied	Satisfied	Neither satisfied/dissatisfied	Dissatisfied	Highly dissatisfied	Total	Chi -square
Less than 5 years	5	4	2	1	1	**13**	**Degree of freedom=12**
5-10 years	15	12	11	3	3	**44**	**Level of significance=0.05**
10-15 years	5	3	0	3	3	**14**	**Table value=21.026**
Above 15 years	5	16	2	3	3	**29**	**Calculated value=212.679**
Total	**30**	**35**	**15**	**10**	**10**	**100**	

It is found from the above table the table value is less than calculated value at 12 Degree of Freedom. Hypothesis is rejected. Hence it is conclude that there is a significant relationship between the experience in export business and level of satisfaction towards overall performance of TEA.

TABLE 5: SHOWING WEIGHTED AVERAGE RANKING FOR FACTORS INFLUENCING IMPORTER

Factors influencing Importer	Total Score	WAS*	Rank
Ability to execute orders on time	1077	10.77	1
Preferential trade Agreement	847	8.47	2
Social Government Stability	315	3.15	3
Exchange Rate	527	5.27	4
Fashion &Design	504	5.04	5
Better Quality	446	4.46	6
Plant efficiency	419	4.19	7
good infrastructure	397	3.97	8
Reliability and Relationship	393	3.93	9
low cost	315	3.15	10

Source: Primary Data (*Weighted average Sore)

From the above table it is clear that.' Ability to execute orders on time is the prime most factor influences importer to buy Indian garments. The second, third and fourth rank was secured by 'PTA', 'Social and government stability', ' Exchange rate', respectively. 'Fashion and design', ' Better quality', 'Plant efficiency', ' Good infrastructure', Factors secured Fifth, Sixth, Seventh and Eight rank respectively. Ninth & Tenth rank was secured by 'Reliability and Relationship', 'Low cost' respectively.

TABLE 6: SHOWING WEIGHTED AVERAGE RANKING FOR CRITERIA THAT ACTS AS A COMPETITIVE EDGE FOR COMPRTITORS

Influencing factors	Total score	WAS*	Rank
FTA,PTA	536	5.36	1
Lower import duty	434	4.34	2
Lower interest rate	414	4.14	3
Stability of labour force	392	3.92	4
Lower labour cost	384	3.84	5
Cheap fabric	349	3.49	6
Lower cost of raw material	291	2.91	7

Source: Primary Data

*Weighted average Sore

The above table clearly depicts that. 'FTA, PTA' is the prime most criteria which act as a competitive edge for Tirupur garment exporters. 'Lower import duty', 'Lower interest rate', 'Stability of labour force', secured second, third and fourth rank respectively. The fifth, sixth and seventh rank was secured by 'Low labour cost', 'cheap fabric' and 'Lower cost of raw material' respectively.

FINDINGS

- 32% of the respondents are highly satisfied with overall performance of AEPC,14% are neither satisfied nor dissatisfied
- 30% of the respondents are satisfies with overall performance of TEA
- 26% of the respondents are highly satisfies with Export Promotion Policies Initiated By Government Of India
- 26% of the respondents feels china as their competitors ,20% feels Bangladesh as their competitors
- 20% of the respondents are not satisfied with availability of labour
- 30% of the respondents are not satisfied with availability of skilled labour
- 42% of the respondents feels that the wages are high
- 24% of the respondents are dissatisfies with export procedures

SUGGESTIONS

- Free Trade Agreement with EU will place garment exports at par with Bangladesh garment exports, as India will also enjoy the custom free duty in EU like Bangladesh and the advantage gained out of it will be helpful for increasing garment exports to the EU market. If Free Trade Agreements (FTA) is not possible across the board in near future, the Government can take a decision to have sector wise agreement including textiles industry
- Ten per cent excise duty imposed on branded readymade garment should be removed
- Governments have to increase the DBK rate to support the exporters and it must store the necessary cotton because of increase in cotton price and surplus cotton can be exported.
- TEA recommends banks to provide the following measures to tackle the current situation:
  - A moratorium for a period of one year in repayment of term loan and interest.
  - Waiver from payment of interest for one year as a special case.
  - Restructuring of the loans without any additional provision to be done by the banks.

CONCLUSION

Tirupur have the ability to take up small orders or large orders at short notice. It is also able to produce the entire range of woven wear and knitwear at low cost with reasonably good quality within specified schedules. However, Tirupur are constrained by occasional delays in delivery. It also suffers from failures to meet standards demanded by higher price niche markets and inability to compete with China, Bangladesh and Sri Lanka in the low price product segment. Non-tariff barriers emerged along with quota phase out (on account of environmental and social issues like child labour and personal safety norms) also affected the growth of the study region. Its inability to reap benefits of economies of scale due to fragmented holdings is yet another threat. At the same time, it also failed to reap the full benefits of a cluster model due to absence of professionalism and snail pace government systems.

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HEALTHCARE AND MEDICAL TOURISM: RETROSPECT AND PROSPECT

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ABSTRACT

There was no tourism in the beginning, Tourism is getting out of the usual rut of things and going away from one's home base for some rest and recreation. It was about meeting new people, seeing new places and having new experiences. The things have come a long way from there as Now, tourism is no longer a singular activity, and it is not about simply having a good time goofing off. These days it is 'thematic tourism'. Tourism has evolved in to sports tourism, eco-tourism, bio tourism, aqua tourism, heritage tourism, beach tourism and so on. Fast jumping on to the thematic tourism bandwagon is Medical Tourism or Health Tourism. Health tourism refers to the increasing tendency among people living where medical services are either very expensive or not available to travel overseas in search of more affordable health options, often packaged with tourist attractions. Today India has become one of the fastest growing economic nations in the field of Medical Tourism. India is one of the leading players in the Medical Tourism industry today. It requires overcoming all the weakness and the barriers to become the emerging industry in the coming years.

KEYWORDS
healthcare, medical tourism.

INTRODUCTION

A simple way to explain the concept of medical tourism would be to say that it is not a standalone effort of either the healthcare or the tourism industry, but is an integrated and collaborative approach from both the industries. India is ranked among the top five international holiday destinations when Independent Traveler conducted a poll in 134 countries. India is rated amongst the world's top ten "must see destinations". Hopefully, today we are in a better position to sell our tourism services to the rest of the world.

India is probably the only country that offers various categories of tourism. These include history tourism, adventure tourism, medical tourism, spiritual tourism, adventure tourism, medical tourism, beach tourism etc. The countries where medical tourism is being actively prompted include Greece, South Africa, Japan, India, Malaysia, Philippines and Singapore. India has the most competent doctors and world class medical facilities. The merits of Medical Tourism in India are best medical treatment, high quality medical care low wait time for treatments, Hospitality, Multi - Talented Doctors and nurses and fluency English Speaking Staff members.

Sports tourism, eco-tourism, bio tourism, aqua tourism, heritage tourism, beach tourism and so on where it has a fast jumping on to the thematic tourism bandwagon is Medical Tourism or Health Tourism. Health tourism refers to the increasing tendency among people living where medical services are either very expensive or not available to travel overseas in search of more affordable health options, often packaged with tourist attractions.

The World tourism Organization includes the following in its definition of medical tourism; medical care, sickness and well-being, rehabilitation and recuperation. The concept of Medical Tourism is not entirely new, As a matter of fact, as far back as 3,000 B.C. people with eye problems made pilgrimage to Tell Brak, Syria, where healing deities were said to perform miracles. Ancient Roman spas that were believed to cure an endless list of ailments still offer hope and relief to bathers today. As people travelled to these destinations they had inadvertently embarked on Medical Tourism.

According to the International Trade Centre, Geneva, the global demand for clinical services has estimated US$804 billion in the year 2000 itself, Where it is a large market and everybody seems to want a piece of the pie. Traditionally, the western countries were considered the leaders and front runners in good healthcare. Times have changed and these days developing nations too are able to offer the same, if not better services in terms of healthcare, technology, and comfort during recuperation and most importantly at affordable prices. As a matter of fact, healthcare costs less in some of these developing nations. This has caused many a person to seek alternate destination to cure their ills outside western countries.

In addition to the ever-increasing cost of healthcare in developed nations, there is also the problem of waiting time. The wait list especially in the UK for both inpatients and outpatients is anything between three weeks to one year. For example, there is a backlog of about 1.2 million patients in major hospitals in Britain alone. The number and wait period increases in non-electric surgery. Non-essential surgery and cosmetic surgery performed by private medical practitioners are prohibitively expensive. Nevertheless, people are clearly interested in image and appearance enhancement medical alternatives. Clearly with

more and more women interested in enhancing their endowments at a reasonable cost, many medical practitioners in these developing countries want to get abreast of the problem.

In view of all these issues, medical tourism has blossomed in many countries as yet another opportunity to get better, look better, feel better, have a good time, see a new place and still have some money left over. And most importantly, they want to have it happens within this lifetime.

The healthcare facilities and the ability of India's healthcare professionals are comparable to some of the best in the world in many areas. This coupled with a stable government with moderate outlooks in many areas and a multitude of holiday destinations make India ideal address for medical tourists. The India Medical Tourism industry although extremely lucrative, faces tremendous challenges from neighbor's i.e. Thailand and Singapore. A sustained effort is needed by the Tourism Board and the Ministry of Health to overwhelm these challenges as soon as they appear. With the pie being as big as it is, India must acknowledge that the competition will mobilize all avenues within its means to garner as much as is possible.

In terms of facilities, we are not in short supply either. India has the right infrastructure, especially when we have comprehensive network of hospitals and clinics. Further, our healthcare professionals are conversant in the English language allowing us to better communicate with the tourists. Moderately conservative figures indicate half a million patients are traveling abroad for health purposes. India with its 5,000 years of medicine has just begun to formally claim its share. Hotels are a key part of the plan. Kerala hoteliers started the trend five years ago with their back water ayurvedic packages. Spas are just the latest phase of the trend.

The true size of the iceberg is always out of sight. Two external agencies, McKinsey and Messe Berlin have painted very bright pictures of medical tourism in India in a short eight years into the future.

QUALITY OF CARE OF THE DOCTORS

Americans and the British are already familiar with highly skilled Indian doctors at their local hospital down the street. What they may not know is that many of these doctors are heading back to India as the living and working conditions here for doctors have changed in the last 15 years or so since liberalization of the economy. India, with its extensive labour pool and extremely educated population is an excellent destination for world class medical treatment. Having had a long association with Great Britain, the English language is prevalent throughout the country.

Two key drawbacks to India, which both the public and private sector are working feverishly to change, are

1. Foreigners are required to obtain a visa to enter the country
2. Many areas outside of the major cities may be unsettling to American visitors who are not accustomed to seeing large scale poverty

This being said, both the hospitals and hotels are totally safe, modern, clean and have world class facilities. During the past few years, many of the top private hospitals in India have build brand new, ultra modern facilities and invested in the latest medical technology in order to lure international patients from around the world.

INDIA BECOMING THE MOST FAVORED MEDICAL TRAVEL DESTINATION

With 8 million tourists in 2012 with an additional of 4 million predicted for 2013, the Indian Tourism Ministry is placing medical travel and tourism on top priority. The National Healthcare Committee and the Indian Tourism Ministry have jointly organized workshops aimed at marketing the country's medical travel industry and Indian medical tourism packages. The focus of these workshops is improvement in the quality and pricing of Indian medical tourism packages, developing competitive strategies and handling litigation issues.

IN INDIA THE STRONG TRADITION OF TRADITIONAL SYSTEMS OF HEALTH CARE IN KERALA

For example, Kerala Ayurveda centers have been established at multiple locations in various metro cities, thus highlighting the advantages of Ayrveda in health management. The health tourism focus has seen Kerala participate in various trade shows and expos wherein the advantages of this traditional form of medicine are showcased. A generic problem with medical tourism is that it reinforces the medicalised view of health care. By promoting the notion that medical services can be bought off the shelf from the lowest priced provider anywhere in the globe, it also takes away the press all its citizens. It is a deepening of the whole notion of health care that is being pushed today which emphasizes on technology and private enterprise. The important question here is for whom is 'cost effective' services to be urea from the government to provide comprehensive health provided. Clearly the services are "Cost Effective" for those who can pay and in addition come from countries where medical care costs are exorbitant – because of the failure of the government to provide affordable medical care. It thus attracts only a small fraction that can pay for medical care and leaves out large sections that are denied medical care but cannot afford to pay. The demand for cost effective specialized care is coming from the developed countries where there has been a decline in public spending ads rise in life expectancy and non communicable diseases that requires specialist services.

INDIA OFFERS WORLD CLASS MEDICAL FACILITIES

Comparable with any other western countries, India has state of the art hospitals and the best qualified doctors. With the best infrastructure, the best possible medical facilities, accompanied with the most competitive prices, you can get the treatment done as India at the lowest charges. A patient will come to India where he will undergo medical treatment and along with that we will show him the Indian tourist and pilgrim destinations, as and when advised by the doctors. The whole thing would save him a lot of money and he will get to discover India at the same time. We assure that we provide the best medical and travel facilities during. As more and more patients from Europe, the US and other well heeled nations with high Medicare package costs look for effectual options. India is rutted against Thailand, Singapore and some other Asian countries, which have good hospitals, salubrious climate and visitor destinations. While Thailand and Singapore with their advanced medical amenities and built-in medical tourism options have been drawing foreign patients of the order of a couple of Lakhs per annum, the quickly growing Indian corporate hospital sector has been able to get a little thousands for cure. The change radically in favor of India, particularly in view of the high eminence expertise of medical professionals, backed by the fast improving tools and nursing amenities and above all, the cost-effectiveness of the pack up.

SWOT ANALYSIS OF MEDICAL TOURISM

Strengths	Weakness
• Quality services at affordable cost • Vast supply of qualified doctors • Strong presence in advanced healthcare • International reputation of hospitals and doctors • High confidence level in Indian Doctors • Diversity of Tourism destination and experience	• No strong initiative to promote Medical Tourism • Customer perception as a hygienic country • Lack of uniform pricing policy • No proper accreditation and regulation system for hospitals • Low coordination between the various players in the industry – airline operations, hotels and hospitals
Opportunity	**Threats**
• Increase demand for healthcare services from countries with aging population (US, UK) • Reduce / Competitive cost of international travel • Demand from countries with underdeveloped countries • Present an opportunity for hospitals to tap the potential of its potential and leverage its business	• Strong Competition from countries like Thailand, Malaysia, Singapore • Under investment in Health infrastructure • Lack of Proper insurance policy for this sector

THE NEW ECONOMY IN MEDICAL TOURISM

It has now become tourism that the services sector is one of the biggest drivers of the India Economy. But it becomes a concrete reality for us in the bigger metros when we see the upward mobility of disadvantaged sections of the community. Young men and women in urban areas now have the prospect of taking up jobs that can rapidly improve their financial and social status. We are all now seeing the children of our domestic servants getting educated and becoming computer operators or call centre workers. Caste and creed are literally no bar for the sunrise industries, which are just hungrily looking for youth with a basic education and a knowledge of English.

The enthusiasm of private hospital care companies to make such investments stems from several studies which indicate that the substantially lower costs in India compared to developed countries are going to lead to a boom in medical tourism. A study by Ernst and young makes the projection that the medical tourism business may reach as much as two billion dollars annually by the year 2014 from the level of 333 million dollars in 2007.

The study which covers many areas of specialization notes that as far as only one segment, eye care is concerned, the country boasts impressive credentials. With 10,000 eye doctors in this country, the status of eye care and surgery is extremely high. Not only our doctors and eye care centers available in the big cities, it is pointed out that they are also available in smaller towns. Interestingly enough, there are even more Lasik centers in India than in many developed countries. Cost effectiveness and quality are said to be the two factors driving the flow of foreign patients to these eye care centers.

Besides, the cost of treatment in India has been estimated to be on an average one eighth to one fifth of those in the west in most areas of specialization. For instance, the Ernst and Young study has found that a cardiac procedure costs anywhere between 40,000 and 60,000 dollars in the US, 30,000 dollars in Singapore, 12,000 to 15,000 dollars in Thailand and only 3000 to 6000 dollars in India. Besides, surgeries costs are also lower not only due to cheaper rates charged by Indian Surgeons but also because of less litigation here. The cost of malpractice insurance in New York is about 1, 00,000 dollars as compared to 4000 dollars in India. One of the reasons for the growing influx of people seeking medical treatment in this country is the pressure on the health services of developed countries like the US and Europe. In the UK for instance, patients have to wait for months to be given critical operations while the lack of insurance makes medical treatment virtually unaffordable. India also has the potential to emerge as a hub for preventive health screening. A total health check up that could cost 350 pounds in the UK can cost as low as 84 dollars in this country. An MRI costs 60 dollars here compared to 700 dollars in New York.

CONCLUSION

Beauty, youth, and wellness are a huge area for growth and we need to promote the aggressively. Over the past few years alone, many countries have realized that an equally big opportunity lies in promoting the more conventional treatments. Some of this, of course, was always happening in the background – like people from Mauritius, Bangladesh and the Gulf coming to India for conventional surgeries and people from Japan flying to Singapore, Malaysia or Thailand for similar reasons. Only now, the nations have started pitching themselves as world class but inexpensive destinations for almost all health requirements.

Today India becomes the fastest growing economic nation due to the Medical Tourism. India is one of the leading players in the Medical Tourism industry today. It requires overcoming all the weakness and the barriers to become the emerging industry in the coming years.

India is not only cheaper but the waiting time is almost nil. This is due to the outburst of the private sector, which comprises of hospitals and clinics with the latest technology and best practitioners. If India will give more benefits to the foreign patients the patient's arrival will improved fourth coming years. In 2020 the India will be the top leader in medical tourism

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TRADE BETWEEN INDIA AND ASEAN COUNTRIES FOR AGRICULTURAL AND MINERAL PRODUCTS: EXPLORING COMPATIBILITY THROUGH REVEALED COMPARATIVE ADVANTAGE

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ABSTRACT

In the post 1990 liberalized economic environment, India made concerted efforts to improve trade relations with ASEAN countries which culminated in signing of the India – ASEAN Free Trade Agreement in August 2009. India - ASEAN FTA in trade in goods which will come to effect from 1st January 2010 envisages reduction and elimination of tariffs in 89.34 percent of the product lines where as the remaining 10.66 percent product lines are kept outside the ambit of tariff reduction in the negative list. For any Regional Trade Agreement (RTA) to be successful, it is imperative on partner countries to have complementary trade structure to be exploited for mutual benefit. Countries which got complementary trade structure are likely to trade more where as economies with similar trade structure often struggle to improve trade share unless there is substantial intra industry trade. Revealed Comparative Advantage (RCA) indices, despite their limitations, provide a useful guide to underlying comparative advantage and offer a further insight into the competitiveness of participating countries and hence reveal the possibility of increased trade cooperation between them. In this direction the paper computed RCA between India and ASEAN countries for Agricultural Products and Mineral Products to understand the trade structure between them. Computation of RCA at finer levels of disaggregation helped to identify complementarity trade structure existing between India and ASEAN.

JEL CLASSIFICATION
F10, F14, F15

KEYWORDS
Agricultural Products, ASEAN, India, Regional Trade Agreements, Revealed Comparative Advantage.

INTRODUCTION

It is generally understood that complementarity in the trade structure of the countries facilitates more export and import between them and there is scope for mutual benefit from this increased trade. Hence identifying and measuring trade complementarity is an important task in realizing trade potential and for forging trade cooperation among countries. Regional Trade Agreements are effective and successful only if they are carefully designed by identifying and collating complementary products and sectors. There are different indices developed to examine the trade pattern and to see whether increased cooperation is possible between nations. In this paper an attempt is made to construct Revealed Compartive Index (RCA) for Agricultural and Mineral Products between India and ASEAN and to see whether increased trade cooperation between these two trading partners is possible or not in these very important sectors.

REVEALED COMPARATIVE ADVANTAGE (RCA) INDEX

Revealed Comparative Advantage Index shows how comparative is a product in countries export compared to the products share in world trade. A product with high RCA is competitive and can be exported to countries with low RCA. Measures of revealed comparative advantage (RCA) have been used to help assess a country's export potential. The RCA indicates whether a country is in the process of extending the products in which it has a trade potential, as opposed to situations in which the number of products that can be competitively exported is static. It can also provide useful information about potential trade prospects with new partners. Countries with similar RCA profiles are unlikely to have high bilateral trade intensities unless intra-industry trade is involved. RCA measures, if estimated at high levels of product disaggregation, can focus attention on other nontraditional products that might be successfully exported. The RCA index of country 'i' for product j is often measured by the product's share in the country's exports in relation to its share in world trade:

$$RCA_{ij} = \frac{(x_{ij}/X_{it})}{(x_{wj}/X_{wt})}$$

Where x_{ij} and x_{wj} are the values of country i's exports of product j and world exports of product j and where X_{it} and X_{wt} refer to the country's total exports and world total exports. A value of less than unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product.

Revealed Comparative Advantage (RCA) for ASEAN countries is calculated at two levels namely Commodity Groups and, HS-2 levels and compared against India's RCA to see trade complementarity between these trading partners. At the aggregate level, RCA is calculated for eight ASEAN countries for Agriculture and Mineral Products for 17 years to identify specific advantage in trade. Data for calculating RCA is collected from IMF, WTO and ASEAN Secretariat.

RCA for ASEAN countries taken together at HS-2 classification for the year 2008 is calculated and compared against India for getting a picture on India - ASEAN trade complementarity. Data pertaining to Brunei, Laos, Indonesia, Myanmar and Vietnam is not included for non availability of data. The following section provides the analysis of RCA for Agricultural commodities and Mineral Products for between India and ASEAN countries.

AGRICULTURAL PRODUCTS

India's RCA for agricultural products for the year 2006 is 1.53 which illustrated that India's agricultural exports are higher than share of agricultural exports in world trade. The RCA for agricultural products among ASEAN countries are high for Indonesia, Malaysia, Thailand and Vietnam. That means India can have higher agricultural exports with other ASEAN countries such as Brunei, Cambodia, Philippines and Singapore.

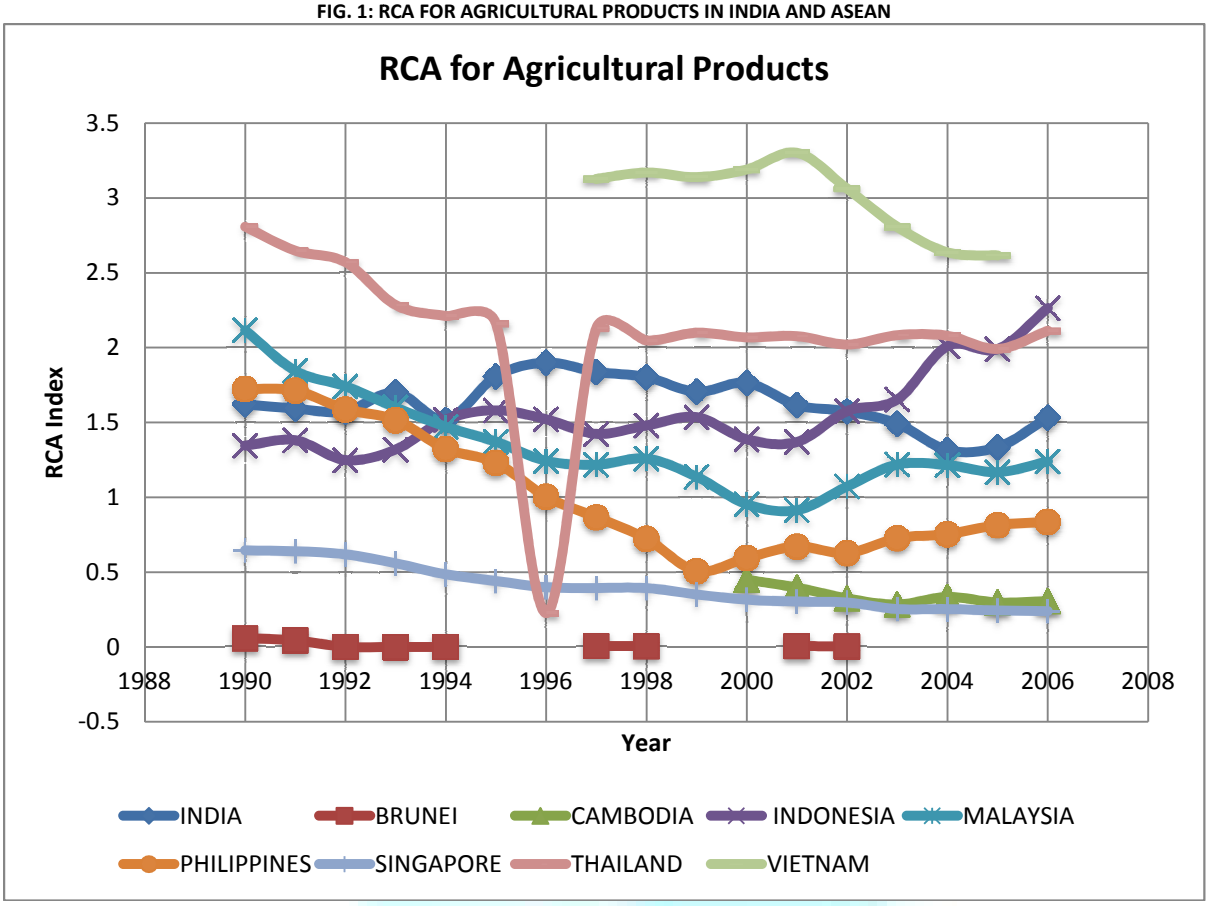
TABLE 1: RCA FOR AGRICULTURAL PRODUCTS IN INDIA AND ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	1.6224	0.0571		1.3455	2.1177	1.7242	0.6458	2.8070	
1995	1.8084			1.5813	1.3717	1.2300	0.4407	2.1597	
2000	1.7649		0.4485	1.3871	0.9534	0.5951	0.3157	2.0677	3.1900
2001	1.6164	0.0061	0.3966	1.3698	0.9139	0.6707	0.3034	2.0756	3.3025
2002	1.5754	0.0030	0.3249	1.5757	1.0727	0.6274	0.2966	2.0201	3.0619
2003	1.4925		0.2846	1.6530	1.2193	0.7270	0.2534	2.0823	2.8072
2004	1.3166		0.3343	2.0105	1.2158	0.7539	0.2532	2.0784	2.6359
2005	1.3353		0.2979	1.9899	1.1680	0.8143	0.2435	1.9904	2.6154
2006	1.5331		0.3070	2.2647	1.2399	0.8363	0.2395	2.1111	

Source: Computed from WTO database

The RCA for the period 1990 to 2006 (seventeen years) provide the long term trend for each product. The mean RCA for agricultural commodity is above one for India, Indonesia, Malaysia, Philippines, Thailand and Vietnam and below one for Brunei, Cambodia and Singapore. This means there is a scope to trade agricultural Commodities between India and low RCA countries of ASEAN such as Brunei, Cambodia and Singapore. Fig. 1 diagrammatically represents the RCA for ASEAN countries and India for the period 1990 to 2006.

FIG. 1: RCA FOR AGRICULTURAL PRODUCTS IN INDIA AND ASEAN



FOOD

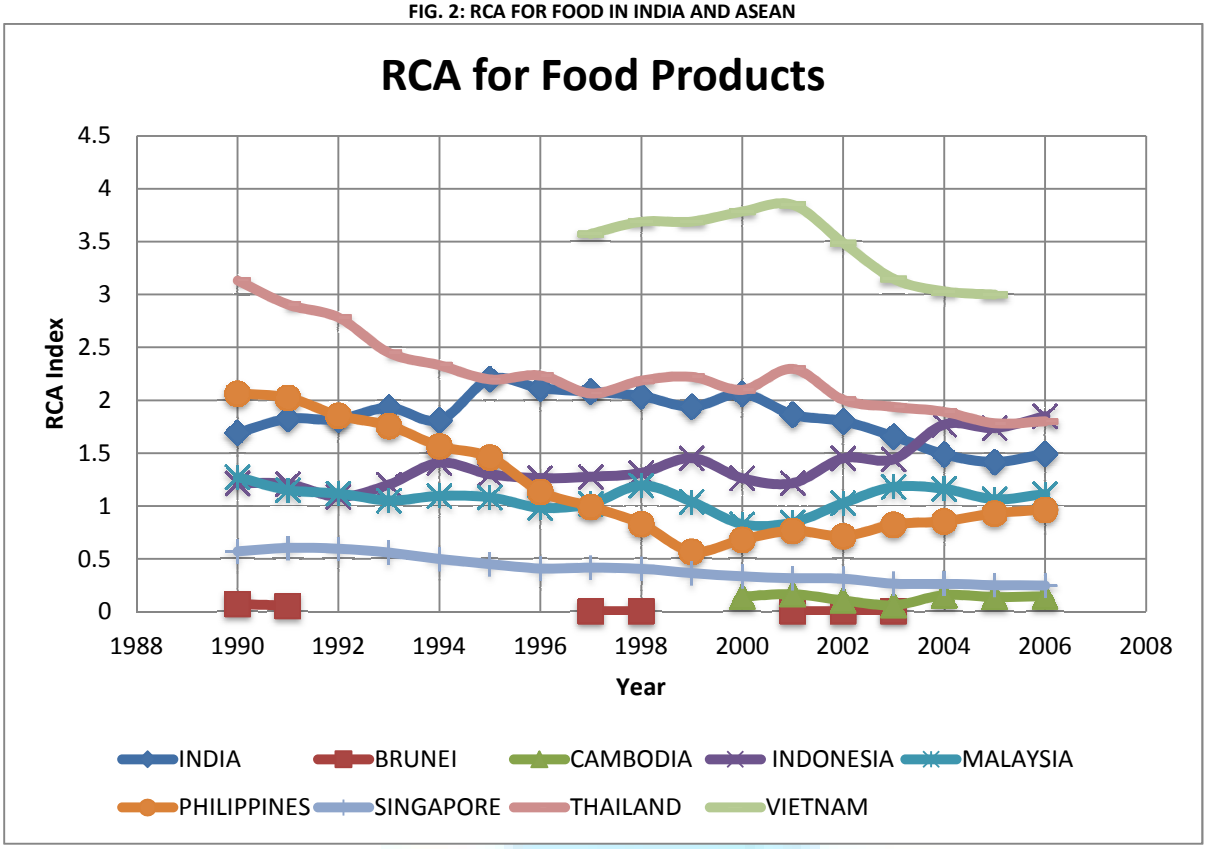
Food items form part of agricultural products and resemble the same pattern of RCA that of agricultural products. RCA for food is high for India, Indonesia, Malaysia, Thailand and Vietnam and low for Brunei, Cambodia, Philippines and Singapore. The average RCA showed that the two ASEAN countries namely Vietnam and Thailand are having a strong RCA of above two. But Brunei, Cambodia and Singapore got a very low RCA in food and India which got a mean RCA of 1.8374 can export food articles to these nations. It is also revealed from the table 4.6 that Philippines and Thailand which had high RCA for food items in the early nineties weakened its RCA over the period time. Table 2 and Fig. 2 provide the RCA for food items for India and ASEAN.

TABLE 2: RCA FOR FOOD IN INDIA AND ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	1.6922	0.0741		1.2146	1.2743	2.0625	0.5694	3.1323	
1995	2.2018			1.2994	1.0817	1.4593	0.4505	2.1973	
2000	2.062		0.1442	1.2631	0.8278	0.6818	0.3353	2.0985	3.7839
2001	1.864	0.0054	0.1674	1.2172	0.8451	0.7656	0.3182	2.2969	3.8486
2002	1.8012	0.0053	0.1079	1.4514	1.0273	0.7134	0.3134	2.0040	3.4874
2003	1.6585	0.0060	0.0632	1.4431	1.1815	0.8243	0.2659	1.9374	3.1470
2004	1.488		0.1590	1.7704	1.1622	0.8553	0.2654	1.8903	3.0291
2005	1.416		0.1413	1.7379	1.0646	0.9298	0.2531	1.7821	2.9978
2006	1.4928		0.1464	1.8487	1.1133	0.9639	0.2489	1.8010	

Source: Computed from WTO database

FIG. 2: RCA FOR FOOD IN INDIA AND ASEAN



FUELS AND MINING PRODUCT

Fuel and Mining are resource based products depending on the natural endowments of the country. But industries can be established to process and refine these products. For Mining and Fuels, RCA is high in Brunei, India, Indonesia, and Vietnam and low in Cambodia, Malaysia, Singapore and Thailand. The three oil rich countries of ASEAN are Brunei, Indonesia and Vietnam and they export petroleum related products to other parts of the world. India has a rich deposit of mineral ores and export them to the mineral scarce countries of ASEAN and rest of the world. India is a huge importer of petroleum crude and its requirements are surging ahead every year and they can look forward to ASEAN oil exporters to meet the demand. Table 3 gives the RCA for fuels and Mining products taken together for India and ASEAN countries.

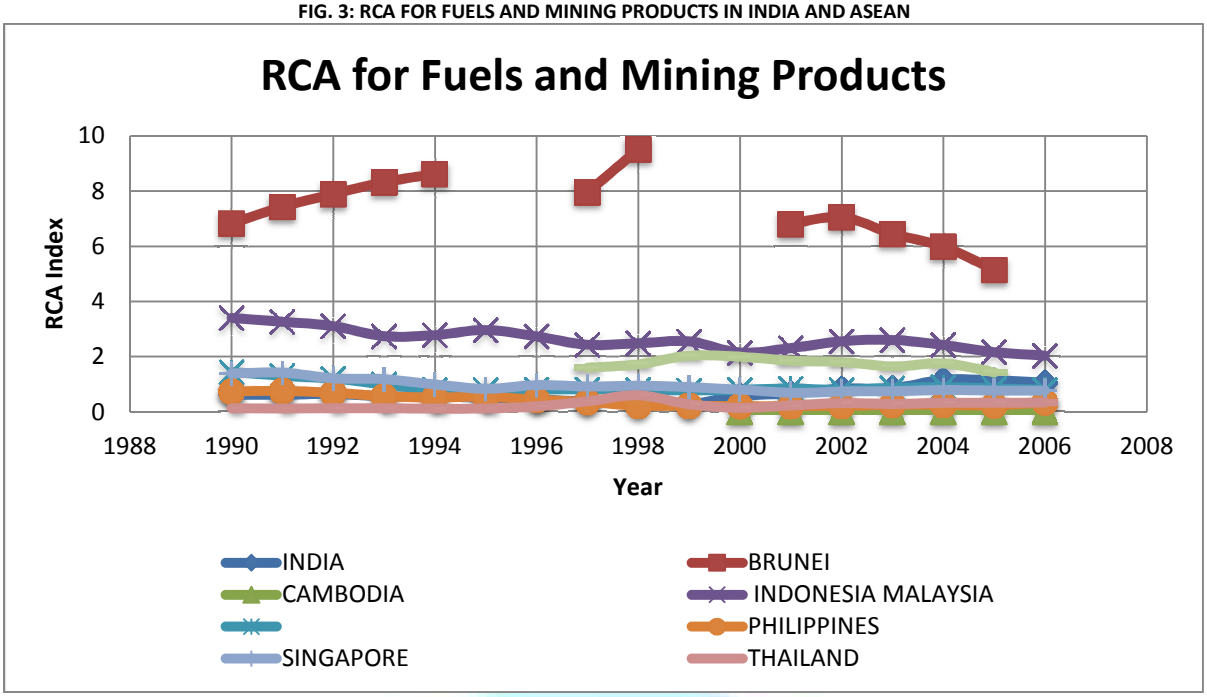
TABLE 3: RCA FOR FUELS AND MINING PRODUCTS IN INDIA AND ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.6106	6.8225		3.3997	1.4410	0.7339	1.3900	0.1323	
1995	0.5136			2.9650	0.7881	0.5456	0.8347	0.1267	
2000	0.5727		0.0005	2.1471	0.7942	0.2102	0.8080	0.1498	2.0004
2001	0.6609	6.8003	0.0004	2.3121	0.8481	0.2111	0.6887	0.2342	1.8595
2002	0.8381	7.0537	0.0001	2.5573	0.7896	0.2190	0.7373	0.3150	1.8086
2003	0.8507	6.4454	0.0016	2.6073	0.8607	0.2574	0.7492	0.2850	1.6552
2004	1.1596	5.9856	0.0006	2.4236	0.8962	0.2585	0.7901	0.3322	1.7611
2005	1.14	5.1412	0.0002	2.1663	0.8426	0.2424	0.7748	0.3254	1.4371
2006	1.0606		0.0003	2.0348	0.7994	0.3483	0.7688	0.3419	

Source: Computed from WTO database

The mean RCA shows, Brunei and Indonesia got strong RCA for fuel and mining products while Vietnam got high RCA and they can export fuel products to Cambodia, Philippines and Thailand who have weak RCA and India, Malaysia and Singapore who have low RCA. This showed there is complementarity in trading fuel products in the ASEAN region. With regard to the mining products alone, India got the comparative advantage in many product categories and can export them to most of the ASEAN countries.

FIG. 3: RCA FOR FUELS AND MINING PRODUCTS IN INDIA AND ASEAN



FUELS

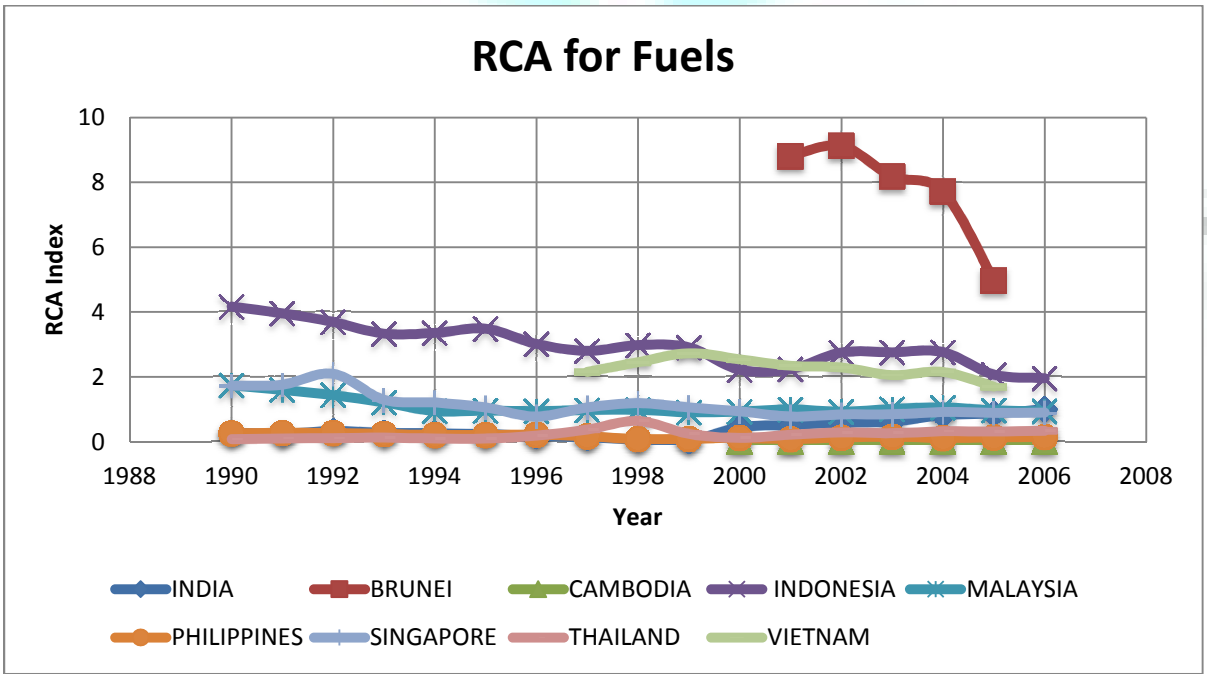
If we consider fuel separately; Brunei, Indonesia and Vietnam got a high comparative advantage. Brunei's single most item of export is petroleum and enjoys the mean RCA of 7.7632. Indonesia is a member of OPEC and Vietnam is exploring new wells to increase petroleum export. Singapore and Malaysia got high RCA in fuels for refining and exporting the products to other countries. India, Cambodia, Philippines and Thailand got weak RCA and import large quantity of fuel from other countries.

TABLE 4: RCA FOR FUELS IN INDIA AND ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.2766			4.1639	1.7431	0.2639	1.7256	0.0792	
1995	0.2353			3.4809	0.9586	0.2062	1.0513	0.0988	
2000	0.4448		0.0001	2.2144	0.9246	0.1221	0.9350	0.1157	2.5388
2001	0.5203	8.8049	0.0003	2.2390	0.9939	0.0850	0.7745	0.2156	2.3419
2002	0.589	9.1306	0.0001	2.7467	0.9233	0.1276	0.8383	0.2876	2.2870
2003	0.6228	8.1856	0.0001	2.7555	1.0072	0.1553	0.8451	0.2636	2.0520
2004	0.8229	7.7207	0.0001	2.7599	1.0554	0.1152	0.9128	0.3238	2.1480
2005	0.871	4.9744	0.0000	2.0658	0.9670	0.1364	0.8863	0.3145	1.6958
2006	1.0095		0.0000	1.9545	0.9371	0.1495	0.8954	0.3396	

Source: Computed from WTO database

FIG. 4: RCA FOR FUELS IN INDIA AND ASEAN



REVEALED COMPARATIVE ADVANTAGE FOR HS-2 CLASSIFICATION

In order to get product level comparative advantage, Revealed Comparative Advantage (RCA) for HS-2 digit classification of Agricultural commodities and Minerals are calculated for India and ASEAN countries for the period 2003 to 2006. The Data pertaining to HS2 classification of commodity exports and imports are extracted from DOTS of WITS (World Integrated Trade Solutions). RCA for the period 2003-2006 is calculated for India and combined ASEAN countries and a mean RCA is obtained for comparison. The HS-2 data is not available for some ASEAN countries and only available data is taken for calculating RCA for ASEAN group. The absolute difference in RCA between India and ASEAN is obtained to understand the extend of complementarity in commodities. This is supplemented with trade performance under HS-4 digits classification to know finer specialization of products by India and ASEAN countries. The results of RCA for HS-2 products for India and ASEAN are discussed below.

Table 5 showed the mean RCA, RCA category and absolute difference in RCA between India and combined ASEAN for agricultural commodities in HS-2 digit classification. Of the 24 HS-2digits commodities, 9 categories showed trade complementarity between India and ASEAN. These include Edible vegetables and certain roots(HS-07),Edible fruit and nuts; peel of citr (HS-08), Prod.mill.indust; malt; starches (HS-11); Oil seed, oleagi fruits; miscellgr (HS-12), Animal/veg fats & oils & their clea (HS-15), Prep of meat, fish or crustaceans(HS-16),Residues & waste from the food industry (HS-23) and Tobacco and manufactured tobacco su (HS-24). The highest RCA for India in agricultural products is in Vegetable plaiting materials; veget (HS14) and Coffee, tea, matï and spices (HS-09) and for ASEAN is Animal/veg fats & oils & their clea (HS15) and Prep of meat, fish or crustaceans (HS-16). The highest absolute difference in RCA is for Vegetable plaiting materials; veget (HS-14) and Coffee, tea, matï and spices (HS-09).

TABLE 5: RCA FOR AGRICULTURAL PRODUCTS IN HS2 CLASSIFICATION

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
01	Live animals	0.0514	0.2266	weak	weak	0.1752
02	Meat and edible meat offal	0.8696	0.0751	low	weak	0.7946
03	Fish & crustacean, mollusc& other	2.4041	1.6525	strong	high	0.7516
04	Dairy prod; birds' eggs; natural ho	0.3893	0.2745	weak	weak	0.1148
05	Products of animal origin, nes or	0.7329	0.2131	low	weak	0.5197
06	Live tree & other plant; bulb, root	0.5906	0.2919	low	weak	0.2987
07	Edible vegetables and certain roots	**1.4093**	**0.4803**	**high**	**weak**	**0.9290**
08	Edible fruit and nuts; peel of citr	**1.6377**	**0.4496**	**high**	**weak**	**1.1881**
09	Coffee, tea, matï and spices.	5.3282	1.1762	strong	high	4.1520
10	Cereals	3.5873	1.3762	strong	high	2.2112
11	Prod.mill.indust; malt; starches;	**0.5891**	**1.0784**	**low**	**high**	**0.4892**
12	Oil seed, oleagi fruits; miscellgr	**1.4195**	**0.1055**	**high**	**weak**	**1.3140**
13	Lac; gums, resins & other vegetable	**9.9841**	**0.4704**	**strong**	**weak**	**9.5137**
14	Vegetable plaiting materials; veget	5.7112	1.2402	strong	high	4.4710
15	Animal/veg fats & oils & their clea	**0.8091**	**4.4486**	**low**	**strong**	**3.6395**
16	Prep of meat, fish or crustaceans,	**0.5465**	**3.0308**	**low**	**strong**	**2.4844**
17	Sugars and sugar confectionery.	2.0349	1.1313	strong	high	0.9037
18	Cocoa and cocoa preparations.	0.0352	0.8690	weak	low	0.8338
19	Prep.of cereal, flour, starch/milk;	0.3507	0.7988	weak	low	0.4481
20	Prep of vegetable, fruit, nuts or o	0.4113	0.8604	weak	low	0.4491
21	Miscellaneous edible preparations.	0.5320	0.8521	low	low	0.3201
22	Beverages, spirits and vinegar.	0.0784	0.3768	weak	weak	0.2984
23	Residues & waste from the food indu	**3.3460**	**0.5091**	**strong**	**low**	**2.8370**
24	Tobacco and manufactured tobacco su	**1.3953**	**0.6878**	**high**	**low**	**0.7075**

Source: Calculated from data extracted from WITS

India enjoys comparative advantage in many mineral products compared to ASEAN countries. These include Iron and steel (HS-72) Articles of iron or steel (HS-73), Copper and articles thereof (HS-74) and Zinc and articles thereof (HS-79) in which India got high RCA against ASEAN. ASEAN's comparative advantage lies in Tin and articles thereof (HS-80) and India can import this from ASEAN as the absolute difference is highest in this category.

TABLE 6: RCA FOR MINERAL PRODUCTS IN HS2 CLASSIFICATION

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
72	Iron and steel.	**1.5293**	**0.3017**	**high**	**weak**	**1.2275**
73	Articles of iron or steel.	**1.5586**	**0.5872**	**high**	**low**	**0.9714**
74	Copper and articles thereof.	**1.7848**	**0.6129**	**high**	**low**	**1.1719**
75	Nickel and articles thereof.	0.0746	0.1882	weak	weak	0.1136
76	Aluminium and articles thereof.	0.5731	0.3871	low	weak	0.1861
78	Lead and articles thereof.	0.4707	0.7170	weak	low	0.2463
79	Zinc and articles thereof.	**1.6277**	**0.4693**	**high**	**weak**	**1.1585**
80	Tin and articles thereof.	**0.6575**	**7.1447**	**low**	**strong**	**6.4872**
81	Other base metals; cermets; article	0.1696	0.2006	weak	weak	0.0310
82	Tool, implement, cutlery, spoon	**1.0636**	**0.5422**	**high**	**low**	**0.5214**
83	Miscellaneous articles of base meta	0.5790	0.4598	low	weak	0.1192

Source: Calculated from data extracted from WITS

ASEAN has strong RCA for Electrical machinery, equipments, parts thereof (HS-85) and high RCA for Nuclear reactors, boilers, machinery (HS-84) against India and export lot of items to India. On the other hand India's RCA include Ships, boats and floating structure (HS-89), Clocks and watches and parts thereof (HS-91) and Works of art, collectors' pieces etc. (HS-97).

CONCLUSION

The Revealed comparative Advantage Index showed that there are trade complementarity between India and some ASEAN countries. For both agricultural Commodities and Food articles, India got comparative advantage and it can export to Brunei, Cambodia, Singapore and Philippines. India got comparative advantage in Mineral Products, but comparative disadvantage in fuel. India can import fuel from Brunei and Indonesia as it imports large volume from the Gulf countries. RCA for HS-2 digit classification shows there are strong complemetarity in products like edible vegetable, edible fruits, malt, gums and resins, animal or vegetable fat, fish or crustaceans etc. In the area of Mineral products there is a trade complementarity in Iron and steel, Articles of iron or steel, Copper and articles thereof, Zinc and articles thereof, Tin and articles thereof and Tool, implement, cutlery, spoon. It reveals there is scope for enhanced trade cooperation between India and ASEAN.

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RELEVANCE OF ISLAMIC BANKING TO INDIAN ECONOMY

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ABSTRACT

Increasing no. of farmers' suicides, growing rate of sick units in small scale industries, huge requirement of infrastructural finance, growing trade deficit and expanding gap between poor and rich class i.e. lack of inclusive growth etc. are the current economic problems of India. Currently practiced Interest Based Banking System has its own limitations in addressing these issues. Economists are opining that Islamic Banking System which propagates interest free banking has the potential to solve these problems. In this context, an attempt is made in this research paper to assess "Relevance of Islamic Banking to Indian Economy". Further, this paper discusses in detail about the problems of currently practiced banking system, principles of Islamic Banking system, economic problems of India, and potential of Islamic Banking in solving these problems.

KEYWORDS

Economic Problems of India, Islamic Banking, Relevance to Indian Economy.

INTRODUCTION

The modern man i.e. 21st century citizen is living in surfeit of luxuries. He is bestowed with motor vehicles such as cars and aero planes to travel, air conditioned bungalows to reside in, KFC's burger to eat up, Raymond garments to wear, corporate hospitals to cure even cancers, financial institutions to lend money without even asking, MNCs to offer million salaried jobs and so on. This is only one side of the coin. Though it is 2000 years AD to us, there are certain sections in the society for which it is 2000 years BC. They are striving hard to get even a single bread piece to eat. Forget about the cars, they do not even have donkeys to travel, forget about AC bungalows, they do not even have proper huts to reside in, forget about the cancer, they die just on mosquito bites, forget about million salary, even a ten rupees note is worth more than a Kohinoor diamond to them. Therefore, 21st century's development is not for all. And it has not resulted in Inclusive Growth. What is to be done for achieving inclusive growth? Dr. Raghuram Rajan, former IMF Chief Economist and the current RBI governor, has recommended Islamic finance for inclusive growth in India. (H. Abdul Rakeeb, 2010).

There is a large no. of farmers who are committing suicide in Vidharba region of India. The reason behind it is the higher interest rates charged by the money lenders which create a cruel debt trap and make the farmers to feel that coming out of this trap is possible only through suicides. What is to be done to stop farmers' suicides? Dr. MS Swaminathan, the Father of Green Revolution in India, while speaking at Karuna Ratna award presentation function in 2010, said, Islamic banking, could hold the key in solving this crisis. (H. Abdul Rakeeb, 2010)

Till 2007-08, Indian economy was clocking a growth rate of 9% for the third year in a row, the biggest growth story in the world. But suddenly, months before the fiscal year ended, its growth rate has started declining. IMF has revised growth rate projections of Indian economy 4 times in 10 months and that too in a negative direction from 8% in June 2008 to 4.5% in April 2009. (Rajesh Chakrabarti, 2009) What made India to lose its growth momentum? The answer is Global Economic Crisis. Saleh Al Tayar, Secretary General of the Franco-Arab Chamber of Commerce, said, "If global banking practices were based on Islamic practices then we wouldn't be seeing the kind of crisis we are living through now". (Justice Mufti Taqi Usmani, 2009)

In this way there is an impressive list of financial experts who are advocating Islamic Finance as an alternative to conventional banking system in light of the principles upon which it is based.

THE CURRENT SCENARIO OF ISLAMIC BANKING

Islamic finance is superior to conventional banking system in achieving socio economic objectives of the society. Hence it is rapidly gaining the importance as most of the economic experts see it as a better substitute to currently practiced interest based banking. Apart from Arab countries, modern, secular and industrialized countries like Britain, Singapore, Japan and Hong Kong have become hub for Islamic Finance. (H. Abdul Rakeeb, 2010) Corporations such as Tesco (UK) and Toyota (Japan) have used Islamic financial instruments to meet their capital requirements. (H. Abdul Rakeeb, 2010) HSBC, Citi Bank etc. have started separate branches that offer Islamic financial products. (CA Ashutosh Verma, 2008) The Sharia-compliant banking system is being practiced in more than 50 countries and there were more than 300 Islamic banks and financial institutions with assets of around $1.6 trillion. (Business Line, 2012)

WHY TO ADOPT ISLAMIC BANKING?

Now-a-days, Islamic Finance is becoming a quiet popular concept among the economists. Many of them opine that it has the potential to replace the currently practiced conventional banking system. When we hear this term called Islamic Finance, the very first question that will crop up in our mind is, "When we already have a banking system which is accepted and operational throughout the world and catering to the needs of all concerned parties, why should we opt for Islamic Finance (Banking) System? What is the problem with the current system?" The answer is that the problem with the current banking system is that it's very foundation is based on interest. We may get astonished at this answer and further raise a question with more voice as "What is wrong if it is based on interest?" Further we argue that we have say Rs. 1bn with us and deposited with the bank. Then the bank gives us say 10% interest per annum with no risk from our side and it charges say 12% pa to the borrowers and thus, makes the profit of 2%. And the borrowers are getting these funds easily which they would not have get in the absence of banks. Therefore, all the parties i.e. depositors, banks and borrowers are happy with this system. Where is the problem?

The answer for this question can be better understood with the following example. It is taught in the marketing classes that the customer is the king. He has certain needs and wants. It is the responsibility of the marketer to identify his needs and offer suitable products / services to make him happy (satisfy). If the marketer does so, then the customer makes him happy by buying his product which results in profits to him. It is a win-win situation to both. Therefore, on the face of it, everything looks fine. There is nothing wrong in this approach when the customer demands a pen or fan or computer and the marketer provides it. But when a customer needs Brown Sugar and the marketer provides it and argues that we (marketer and customer) are happy with each other as we are getting what we need (profit and Brown Sugar respectively). Then we say that the marketer has ignored his social responsibility and called as 'smuggler' but not

marketer. Hence it can be conveniently said that mere satisfaction of needs of all the parties involved in business dealing does not make any concept as a valid theory.

Similar is the case with the current banking system. On the face of it, Interest Based Banking System seems to be a correct practice but it has severe implications on the order of the society.

PROBLEMS WITH INTEREST BASED BANKING SYSTEM

From the above discussion it is concluded that though conventional banking system seems to be a correct practice, one may not certain its advantages, it may have some disadvantages which have been ignored. Let us though a light on various disadvantages of Interest Based Banking System in detail. Though it has various disadvantages a few of them are highlighted here.

1. **It brings Injustice to Lender and Borrower both:** (Justice Mufti Taqi Usmani, 2009)

Assume that there is a lender who lent Rs. 1 billion @ 10 % per annum to a borrower. The borrower has done business with this money and generated the profit of Rs. 1 billion. Out of this profit, he gives only 10% to the lender and the rest is enjoyed by him. It is the injustice to the lender as borrower has generated this profit with the money of the lender but throws a meager of 10%. (One may argue by saying that the borrower has to get more reward than the lender as he generated this profit with his talent and efforts. But remember that if the lender doesn't provide money, then the so called talent of the borrower goes waste. So there is no borrower's business without a lender. Thus, he must be rewarded adequately but not meagerly. One should not misunderstand by reading this article that it is argued in this article that borrower must get interest. But, what is argued here is that he deserves more return which this interest based banking system fails to offer.) Similarly, in the same agreement, if the borrower fails to generate profits, in other words, incurs losses, still he has to pay interest. It means lender's return is assured / risk free whereas borrower's return is left to his fate. It is obviously a glaring injustice to the borrower. Therefore, Interest Based Banking System brings injustice to lender when borrower gets huge profits and brings injustice to borrower when borrower gets losses.

2. **It Results in Inappropriate Allocation of Money Pooled by the Banks:** (Justice Mufti Taqi Usmani, 2009)

Banks, in general, pool money from a broader section of the society i.e. poor, in the form of savings. These savings are lent to the entrepreneurs who are in a position to offer collateral. Only the big entrepreneurs can offer collateral and borrow money. But the poor people, though have a good project to undertake, are denied to get loans as they cannot offer collateral. It means, the money which is present with the banks belong to poor. But, this poor's money is not lent to poor because they cannot offer collateral. Is it not an injustice?

3. **It Leads to Unequal Distribution of Profits:** (Justice Mufti Taqi Usmani, 2009)

In numerous cases the funds deployed by the big entrepreneurs from their own pocket are much less than the funds borrowed from financial institutions. These entrepreneurs having only 10 million of their own acquire 90 million from the banks and embark on a huge profitable enterprise. If these huge projects bring enormous profits, only a small proportion goes to banks whose input in the projects was 90% while all the rest of the profit is enjoyed by the big entrepreneurs whose real contribution to the projects was just 10%. Therefore, these conventional banks have provided an opportunity to rich entrepreneurs to do business with the pooled money of the poor but only a very less percentage of return is given to them. It is another disadvantage with this banking system.

4. **It Ruins the Profits of Small Scale Industries:** (Justice Mufti Taqi Usmani, 2009)

Small Scale Entrepreneurs generally do not have sufficient funds to start the business. With lot of difficulty, they offer collateral to banks to get loans to start their own business that too at a high interest rate say 10% pa. If their earnings are say 15%. Then, they have to pay this 10% interest to the banks and the net profit to them is meager 5% only. Meaning that major portion of their earnings is eaten by these bank loans. One can imagine the heart breaking position of the small scale entrepreneur who puts his heart and soul in the business, fights with the competitors with tooth and nail and at the end ends with the meager profits after paying the interest. Sometimes he has to end up with losses after paying the interest. It is not that he has not generated profits but these profits are looted by banks. It is the disadvantage with interest based banking system to Small Scale Industries

5. **It Results in Financial Economy which is not backed by Real Assets:** (Justice Mufti Taqi Usmani, 2009)

Assume that a bank has lent 1 billion to a company @10% pa. This company has to produce the goods of 1.1 billion at least to be profitable. If it earns the profit, then it is in a position to pay interest. But, if the firm generates 0.80 billion only and incurs the losses, then the real assets (i.e. goods / services produced) in economy should become 0.80 billion. It means bank's asset (cash) value must become 0.80 bn. But, surprisingly, bank's assets value is unaffected by the loss of borrower and becomes 1.1 billion only because it forces the firm to pay 1.1 bn. In this case, there will be maturity mismatch between assets (production) and liabilities (paying 1.1bn is the liability for the firm). Thus, the money grows continuously irrespective of production. It means growth in money is not backed by real assets which results in financial economy rather than the real and it is more prone to economic crisis.

These are the few noteworthy disadvantages of currently practiced Interest Based Banking System. Islamic Finance, also known as Interest Free Banking System is the single solution for all these problems. It can kick out all these problems from the economy at a single stroke.

CONCEPT OF ISLAMIC FINANCE

Islamic finance can be described as a system of finance that adheres to the principles of Sharia i.e. The Islamic Law. (Mohannad Badi et al, 2008) In other words, it can be viewed as a financial system which identifies itself with the spirit of Sharia (The Islamic Law), as laid down by the Holy Qur'an and Sunnah (the practices of Prophet Mohammed (Peace Be Upon Him)), as regards its objectives, principles, practices and operations. (Dr. Shahid Hasan Siddiqui, 2008) Islamic Finance is based on the following principles. (H. Abdul Rakeeb, 2010)

1. **Prohibition of Receipt and Payment of Interest:** This is because when a person having money is allowed to earn more money on the basis of interest, either in spot or in deferred transactions, it becomes easy for him to earn money without taking pains in real economic activities. Besides, Islam prohibits interest on following grounds. (Justice Mufti Taqi Usmani, 2009)

- *Money is not a commodity*
- *Money is not a Production Good*
- *Money is a Medium of Exchange and it must be used only for this purpose*
- **Money is not a commodity**: One of the wrong presumptions on which all theories of interest are based is that money is treated as a commodity. It is, therefore, argued that just as a merchant can sell his commodity for a higher price than his cost, he can also sell his money for a higher price than its face value, or just as he can lease his property and can charge a rent against it, he can also lend his money and can claim interest thereupon. Islamic principles, however, do not subscribe to this presumption. Money and commodity have different characteristics and therefore they are treated differently. The basic points of difference between money and commodity are as follows.
  - Commodity has intrinsic utility which can be utilized in direct fulfillment of human needs whereas money doesn't.
  - The commodities can be of different qualities while money has no quality. An old and dirty note of Rs. 100/- has the same value as a brand new note of Rs. 100/-.
- **Money is not a Production Good**: Economists have classified commodities into two categories i.e. consumption goods and production goods. As the modern economists assumed that money is a commodity, they have to place it in either of the categories. Since money has no intrinsic utility, it is not consumption good. Hence it could not be included in consumption goods category. Therefore, they are left with no option but to place in production goods category. Funnily, there are no sound logical arguments to prove that money is a production good.
- **Money is a Medium of Exchange and it must be used only for this purpose:** Islamic Law has restricted the scope of money to its basic purpose i.e. to act as a medium of exchange and a measure of value. If, for exceptional reasons, money has to be exchanged for money or it is borrowed, the payment on both sides must be equal because it is not used for the purpose it is not meant for i.e. trade in money itself. Imam Al-Ghazzali, a Muslim scholar existed about 9

centuries ago has undertaken a comprehensive analysis of the nature of money and said that money should not be treated as a commodity meant for being traded in. In light of the above interest is prohibited.

2. **Emphasis is on Profit and Loss Sharing:** Islam replaces debt contracts with equity contracts. (Sarika Malhotra, 2010) The major reason to emphasize on profit and loss sharing in Islam is to remove the injustice caused by these debt contracts to the borrower and lender and to make everyone to prosper from business by appropriately apportioning the profits. At the same time it emphasizes on sharing the losses, if any, so that only one party should not become the victim of losses.
3. **Prohibition of Projects that offer Returns with more variability:** Islamic Finance takes enough care to prevent the business from yielding losses. It believes that the loss is the result of more variability in the cash inflows. Hence the projects which offer more variability in cash flows must be avoided to safeguard interest of the investors. It does not mean that revenues are risk free but enough precautions are taken to minimize the risk.
4. **Prohibition of Speculation:** Speculation is another form of gambling. It involves taking more risk with the hope to get more returns in short run. This statement itself states that there is more risk. But taking more risk may result in losses to the partners of the business. Hence such acts are prohibited.
5. **Prohibition of Financing Socially Detrimental Projects:** The objective of Islamic Finance is to make a positive contribution to the fulfillment of socio – economic objectives of the society. (Dr. Shahid Hasan Siddiqui, 2008) It wants that investors must get higher returns but it should not be at the cost of social values. Therefore, investment in social value destroying activities such as gambling, pornography, alcohol, defense armaments, casinos etc. is prohibited in Islam to shape an ethical and responsible society. (Iqbal Khan, 2009)
6. **Asset Backing Principle:** In Islamic Finance, it is required that financial transactions should be unpinned by an identifiable and tangible underlying asset. (H. Abdul Rakeeb, 2010) Financial transactions must be accompanied by an underlying productive economic activity that will generate legitimate income and wealth. Therefore, there is a close link between financial transactions and productive flows. Thus, the growth in Islamic financial assets is generally accompanied with growth of underlying activities that have economic value. (Dr. Zeti Akhtar Aziz, 2010) Therefore, it produces real economy which is less prone to economic crisis.
7. **Transparency Principle:** In Islamic banking, all the parties are treated as partners in the business. Hence they must be adequately informed on all the financial dealings i.e. there will be full disclosure of information on all the aspects of the business to all the concerned parties.

RELEVANCE OF ISLAMIC BANKING TO INDIA

Islamic Banking may have countless advantages; but the question is, "Is it relevant to India"? Islamic Banking becomes relevant to India only when India has any problems which are not solved by the currently practiced banking system. The Economic Problems of India are given below.

1. **Indian economy is an Agricultural Economy** where more than 50% of people are engaged in agriculture but there is a continuous growth in the suicides of farmers due to debt trap. Few statistics about farmers suicides are **(Dr. P. Deshmukh, 2011)**: The number of farmers who have committed suicide since 1997 to 2008 all India level was 199132. On an average one farmer committed suicide for every 53 minutes in India. National Crime Records Bureau estimated that not less than 200000 farmers committed suicide between the above said tenure.
   It is worth noticing that now-a-days, the government is coming out with interest free loan scheme to stop farmers' suicides. But, this scheme would be a burden to the economy as it is a scheme which has cost but does not generate revenue. Islamic Banking operates in a different way to solve this problem. No doubt Islamic Bank offers interest free loans to the farmers but enters into contract with the farmers to share the productivity (profit or loss) of the crop on agreed proportion thus generates revenue and hence there is no burden on the economy. Thus, Islamic Banking is relevant to India.
2. **Huge Investment in Infrastructure is required in 12th FY plan i.e. $ 1 trillion.** Infrastructure development, rural regeneration and other development projects need huge foreign investment at reasonable cost. It worth here to quote the statement made by Kerala's Finance Minister, Thomas Isaac, "We need long-gestation funds to build airports, high-speed trains and expressways. Islamic finance promises unexplored potential in that context." There is a view that India's needs in financing large infrastructure projects can be met by attracting the Gulf surplus (estimated at up to $3 trillion) provided the "right opportunity" is created. During the financial crisis, Muslim investors in the Gulf were seeking opportunities to invest through Islamic financial products in emerging economies like India. Failing to get such opportunities in India, they are now parking their investments in Islamic banks of the UK and switching to other emerging economies like China, Taiwan, Indonesia and Malaysia. India is definitely missing billions of dollars in investment funds that could be mobilized in terms of Islamic investments. It is really a missed opportunity because savings of UAE (which is one among the Top 10 investing countries in India) are not tapped fully. UK, China, Malaysia, Indonesia, Taiwan are benefiting from our indecisiveness. If Government of India allows Islamic Banking in India, It can solve this problem.
3. **Increasing rate of sickness in SSIs**: According to MSME Annual Report 2011-12, till 2010 – 2011, there were about 311.52 lakhs of Small Scale industries with 732.17 lakhs of people employed, Rs. 773487crores of investment and Rs. 1095758 of production value. But there are certain hurting facts about the SSI sector in India. From the report of DCMSME on Registered SSI Sector, it is found that total number of SSI units permanently registered up to 31-3-2001 was 22, 62, 401. Of which 13, 74, 974 units (61 %) were found to be working and 8, 87,427 units (39 %) were found to be closed. Islamic Finance could hold a key in solving this problem.
4. **Non - inclusive Growth:** According to United Nations Human Development Report (2009), Poverty in India is widespread, with the nation estimated to have a third of the world's poor. In 2010, the World Bank reported that 32.7% of the total Indian people fall below the international poverty line of US $ 1. 25 per day (PPP) while 68.7% live on less than US $ 2 per day. According to 2010 data from the United Nations Development Programme, an estimated 29.8% of Indians live below the country's national poverty line. A 2010 report by the Oxford Poverty and Human Development Initiative (OPHI) states that 8 Indian states have more poor people than 26 poorest African nations combined which totals to more than 410 million poor in the poorest African countries. By observing these facts, H Abdul Rakeeb (2010) has opined that there is no middle class as such in India. There are only two classes i.e. Super Rich and Super Poor**.** Dr. Raghuram Rajan, the Governor of RBI has opined that Islamic Banking is a very useful tool for promoting Inclusive growth India. (H. Abdul Rakeeb, 2010)

CONCLUSION

Currently practiced Interest based banking system has many disadvantages. It causes injustice to lender as well as borrower, allocates the money pooled by the banks inappropriately, leads to non inclusive growth, ruins the profits of profits of small scale industries, and produces financial economy which is more prone to economic crisis. It could not stop the farmers' suicides, shutting down of SSI, increasing poverty etc. If the Banking practices of India are based on Islamic banking, it could stop all these problems. Hence many experts are advocating it in India. Current RBI Governor, Raghu Ram Rajan, Dr. Swaminathan are few of them. In light of the above, Indian Government must think seriously about adopting Islamic Banking model in India. India may implement the same by obtaining inputs from the global example in UK, Malaysia and Singapore. If Hong Kong, USA, UK, Germany can become business hubs of Islamic Banking, why not our India?

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AXIOMATIZATION OF THE PREFERENCE CORE IN MULTICRITERIA COOPERATIVE GAMES

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ABSTRACT

In a multicriteria game each player may have several criteria; where as the classical cooperative game has only one criterion. In this paper, we analyze the preference core and some of its properties are discussed. We axiomatized the preference core by means of reduced game properties.

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KEYWORDS
Cooperative games; multicriteria games; preference core.

1. INTRODUCTION

Operations research models consist of optimization problems in which the members involved in decision making models must take into account of one or several objective functions and analyze how to act in an optimal way. Optimization theory analyzes situation in which a decision maker faces an optimization problem with one or several criteria. Instead of a single decision maker if several decision makers interact, then game theory is a suitable framework. In scalar valued cooperative games, problems have been analyzed from a single criterion perspective. Multi-criteria game theory arises when several members of decision making models, each one controlling several criteria which can not be isolated. This type of situation occurs in many economic, political and social contexts.

Multicriteria strategic form games were first introduced by Blackwell (1956). A methodological approach to vector valued cooperative games has been addressed in Jornsten et al. (1995) and Fernandez et al. (2002). Voorneveld and van den Nouweland (1998) introduced a general model of cooperative multi-criteria game with public and private criteria which includes the multi-commodity games as a particular case. Two different notions are considered in order to establish a solution in multi-criteria games. In literature, the core solutions are proposed in the papers of Fernandez and Puerto (1996), Fernandez et al. (1998), Puerto et al. (1999), Borm et al.(2003) and Fernandez et al. (2002). In this paper, we focus on axiomatization of the preference core in cooperative vector-valued games. In strategic form games, Peleg (1986), and Tadenuma (1992) provide several axiomatizations for finite strategic form games. In this paper one of these axiomatizations have immediate generalization.

The organization of the paper is as follows. In Section 2, we summarize the necessary definitions and basic results. In section 3, the preference core is defined, and the solution concept is axiomatized. Finally, section 4 gives the concluding remarks.

2. NOTATIONS AND BASIC RESULTS

We shall consider a multicriteria game with *n* players. Let *N* = {1, 2 ,...., *n*} denote the set of players. We assume that each player $i \in N$ values the same set of criteria {1, 2 ,...., m}.

Definition 2.1

A cooperative multicriteria vector valued transferable utility *(TU)* game is a pair *(N,v), where N is the set of players and a characteristic function* $v : 2^N \to R^m$ *associating a vector* $v(S) \in R^m$ *, to every subset (coalition)* $S \in 2^N \setminus \{\phi\}$, and $v(\phi) = 0 = \{(0,0,....,0)^t\} \in R^m$. For each coalition $S \subseteq N$, the vector $v(S) \in R^m$ is interpreted as the total gain or worth which the members of S can achieve by cooperation. We denote by G^v the class of all cooperative vector-valued transferable utility (TU) games.

If all players in *N* decide to cooperate, then the well-known game theoretic problem is how the vector $v(N) \in R^m$ should be allocated among the players in *N* by taking into account all possible coalitions under each criterion. An allocation in a vector-valued game can be represented by a *m*×*n* payoff matrix,

$$X = \begin{pmatrix} x_1^1 & x_1^2 & \dots & x_1^n \\ x_2^1 & x_2^2 & \dots & x_2^n \\ \dots & \dots & \dots & \dots \\ x_m^1 & x_m^2 & \dots & x_m^n \end{pmatrix}$$

The i^{th} column of matrix X, $X^i = (x_1^i, x_2^i, ..., x_m^i)^t \in R^m$ represents the payoffs of player *i,* in each of the *m* criteria.

The j^{th} row of matrix X, $X^j = (x_j^1, x_j^2, ..., x_j^n) \in R^n$ represents the payoffs for each player in the j^{th} criterion.

The overall payoff obtained by coalition $S \in 2^N \setminus \{\phi\}$, is the sum $X^S = \sum_{i \in S} X^i$.

We denote $X^*(N,v) = \{X \in R^{m \times n} : X^N \leqq v(N)\}$. The set $X^*(N,v)$ is the set of feasible allocations for the game (*N, v*).

A Solution on G^v is a function σ which associates with each game $(N,v) \in G^v$ a subset $\sigma(N,v)$ *of* $X^*(N,v)$.

We denote $X^0(N,v) = \{X \in R^{m\times n} : X^N = v(N)\}$. The set $X^0(N,v)$ is the set of Pareto optimal allocations or the set of preimputations for the game (*N, v*).

For any positive integer *m*, the following notation will be used with respect to given vectors $x = (x_1, x_2, ..., x_m) \in R^m$, $y = (y_1, y_2, ..., y_m) \in R^m$.
We denote by

$x \leqq y$ *if* $x_i \leqq y_i$ *for all* $i = 1,2,..., m$; $x \leq y$ *if* $x \leqq y$ *but* $x \neq y$.

If *N* is a grand coalition, then we denote $\mathcal{P}(N) = \{S \subseteq N : |S| = 2\}$.

3. THE PREFERENCE CORE

For any positive integer m > 1, it is known that any two vectors in R not comparable always. Fernandez et al. (2002) have proposed that at least two different orderings are possible among the vectors. The core concept of the scalar valued cooperative TU games is extended to vector-valued cooperative TU games. In literature, several core concepts are defined based on the ordering of vectors in the payoff space. We consider allocations in which no coalition has any incentive to deviate irrespective of the criteria and define the concept of preference core.

DEFINITION: 3.1

The Preference Core *PC* (N,v) of a vector-valued cooperative TU game $(N,v) \in G^v$ defined by

$PC(N,v) = \{X \in X^0(N,v) / X^S \geqq v(S),\ \text{for all}\ S \subset N,\ S \neq \phi\}$

Fernandez et al. (2002) have given a necessary and sufficient condition for the non-emptiness of the preference core.

4. AXIOMATIZATION OF THE PREFERENCE CORE

In this section we describe the axioms which are used to axiomatize the preference core. First, we define a reduced game of a vector-valued game $(N,v) \in G^v$.

Definition: 4.1

Let $(N,v) \in G^v$, $S \in 2^N \setminus \{\phi\}$, and let $X \in X^*(N,v)$. The reduced game (S, v_X^S) *with respect to allocation X and coalition S* is the game defined by

$$v_X^S(T) = \begin{cases} 0 & \text{if } T = \phi; \\ v(N) - X^{N\setminus S} & \text{if } T = S; \\ \max_{Q\subseteq N\setminus S} (v(T\cup Q) - X^Q), & \text{otherwise} \end{cases}$$

We generalized the definition of Davis and Maschler (1965) for single criteria games. The reduced game (S, v_X^S) describes the following situation. Assume that all agents in *N* agree that agents of $N \setminus S$ will get $X^{N\setminus S}$. Then, the agents in *S* may receive $v(N) - X^{N\setminus S}$. Furthermore, assume that the agents in $N \setminus S$ continue to cooperate (not expecting the worth more than $X^{N\setminus S}$) with the agents of S. Then, for every $T \neq \phi$, $T \subset S$, can cooperate with some of the agents in $N \setminus S$ and increase their worth $v_X^S(T)$ is the maximum payoff that the coalition *T* is expected to get.

Let us consider the following axioms that are used in the rest of this section. Let σ be a solution on the class of all vector-valued cooperative games G^v.

Non-emptiness (NE): For all $(N,v) \in G^v$, $\sigma(N,v) \neq \phi$.

Pareto optimality (PO): For all $(N,v) \in G^v$, $\sigma(N,v) \subseteq X^0(N,v)$.

Individual rationality (IR): For all $(N,v) \in G^v$, *and* $X \in \sigma(N,v)$, then $X^i \geqq v(\{i\})$ for all $i \in N$.

Superadditivity (SUPA): $\sigma(N,v_1) + \sigma(N,v_2) \subseteq \sigma(N,v_1+v_2)$ whenever $(N,v_1), (N,v_2)$ *and* (N,v_1+v_2) are in G^v.

Reduced Game Property (RGP): For all $(N,v) \in G^v$, $S \subseteq N$, $S \neq \phi$ *and* $X \in \sigma(N,v)$, then $(S, v_X^S) \in G^v$ and $X^S \in \sigma(S, v_X^S)$.

Weak Reduced Game Property (WRGP): For all $(N,v) \in G^v$, $S \subseteq N$, $1 \leq |S| \leq 2$, *and* $X \in \sigma(N,V)$, then $(S, v_X^S) \in G^v$ and $X^S \in \sigma(S, v_X^S)$.

Converse Reduced Game Property (CRGP): For all $(N,v) \in G^v$, $|N| \geq 2$, *and* $X^* \in \sigma(N,V)$, $(S, v_X^S) \in G^v$ and $X^S \in \sigma(S, v_X^S)$ for every $S \in \mathcal{P}(N)$, *then* $X \in \sigma(N,v)$.

It is straightforward that the preference core satisfies IR, and SUPA.

We denote $G_{PC}^v = \{(N,v) \in G^v : PC(N,V) \neq \phi\}$ where G^v is the class of all vector-valued cooperative TU games.

Lemma 4.1 *The preference core satisfies* RGP *on* G_{PC}^v.

Proof: Let $(N,v) \in G_{PC}^v$, $X \in PC(N,v)$, and let $\phi \neq S \subseteq N$. *Let* $T \in 2^S \setminus \{\phi\}$.

If $T = S$, then $v_X^S(T) = v(N) - X^{N\setminus S} = X^N - X^{N\setminus S} = X^S$, since $v(N) = X^N$.

If $T \neq S$, then $v_X^S(T) - X(T) = v_{Q\subseteq N\setminus S}^{\max}(v(T\cup Q) - X^Q) - X^T$

$= v_{Q\subseteq N\setminus S}^{\max}(v(T\cup Q) - X^{T\cup Q}) \leqq 0.$

Thus $X^S \in PC(S, v_X^S)$. This completes the proof.

Note that the property WRGP is weaker version of RGP, RGP implies WRGP.

Lemma 4.2 *The preference core satisfies* CRGP *on* G^ν.

Proof: Let $(N,v) \in G^\nu$, $X \in X^0(N,v)$, and let for every $S \in \mathcal{P}(N)$, $(S, v_X^S) \in G^\nu$, *and* $X^S \in PC(S, v_X^S)$.

As $v_X^S(S) = X^S$ and $v_X^S(S) = v(N) - X^{N \setminus S}$ implies that $X^N = v(N)$.

Now let $T \in 2^N \setminus \{\phi, N\}$. Choose $i \in T$, $j \in N \setminus T$ and let $S = \{i, j\}$.

Since $X^S \in PC(S, v_X^S)$, $0 \geq v_X^S(\{i\}) - X^i \geq v(T) - X^T$, by definition of RGP. Thus, $X^T \geq v(N)$ *for all* $T \in 2^N \setminus \{\phi, N\}$.

Hence $X \in PC(N,v)$.

Lemma 4.3 *Let* σ *be a solution on a set* G^ν *of games. If* σ *satisfies* IR *and* WRGP, *then it also satisfies* PO.

Proof: Suppose, on the contrary, that σ does not satisfy PO. Then for some $(N,v) \in G^\nu$, and some $X \in \sigma(N,v)$ such that $X^N \neq v(N)$.

Let $i \in N$. By WRGP, $(\{i\}, v_X^{\{i\}}) \in G^\nu$, and $X^i \in \sigma(\{i\}, v_X^{\{i\}})$.

By Definition 4.1, $v_X^{\{i\}}(\{i\}) = v(N) - X^{N\setminus\{i\}} = v(N) - X^N + X^i \neq X^i$

Since $v(N) - X^N \neq 0$.

This contradicts the fact that $X^i \geq v_X^{\{i\}}(\{i\})$.

This contradiction leads to the completion of the proof.

Lemma 4.4 *Let* σ *be a solution on a set* G^ν *of games. If* σ *satisfies* IR *and* WRGP, *then* $\sigma(N,v) \subseteq PC(N,v)$ *for every* $(N,v) \in G^\nu$.

Proof: Let $(N,v) \in G^\nu$ be an *n*- person game.

If *n* = 1, then $\sigma(N,v) \subseteq PC(N,v)$ by IR.

By Lemma 4.3. σ Satisfies PO. Hence, if *n* = 2, then

$\sigma(N,v) = \{X \in X^0(N,v) : X^i \geq v(\{i\})$ *for all* $i \in N\} = PC(N,v)$.

If $n \geq 3$ and $X \in \sigma(N,v)$, then WRGP implies that $X^S \in \sigma(S, v_X^S)$ for all $S \in$ P(*N*), so $X^S \in PC(S, v_X^S)$ for every $S \in$ P(*N*).

By Lemma 4.2, $X \in PC(N,v)$.

Theorem 4.1 *A solution* σ *on* G_{PC}^ν *satisfies* NE, IR, SUPA *and* WRGP, *if and only if* σ *is the preference core.*

Proof: On G_{PC}^ν, it is clear that the preference core satisfies NE, IR, and SUPA. By Lemma 4.1, the preference core satisfies WRGP. Let σ be a solution on G_{PC}^ν that satisfies NE, IR, SUPA and WRGP and let $(N,v) \in G_{PC}^\nu$ be an *n*-person game. We have to show that $\sigma(N,v) = PC(N,v)$.

By Lemma 4.4, $\sigma(N,v) \subseteq PC(N,v)$.

Thus we only have to show that $PC(N,v) \subseteq \sigma(N,v)$.

Let $X \in PC(N,v)$. The following two cases may occur.

Case 1: Let $(N,v) \in G_{PC}^\nu$ with $n \geq 3$.

Define: $(N,v) \in G_{PC}^\nu$ as $w(\{i\}) = v(\{i\})$ *for all* $i \in N$ *and* $w(S) = X^S$ *for all* $S \subseteq N$ *with* $|S| \geq 2$.

First, we show that $PC(N,w) = \{X\}$.

Let $Y \in PC(N,w)$ be given. For all $i \in N$, $Y^{N\setminus\{i\}} \geq w(N\setminus\{i\}) = X^{N\setminus\{i\}}$.

Also $Y^N = w(N) = X^N$ implies that $Y^N = X^N$.

Thus $Y^N - Y^{N\setminus\{i\}} \leq X^N - X^{N\setminus\{i\}}$.

That is, $Y^i \leq X^i$ *for all* $i \in N$.

From these statements, we conclude that $Y^i = X^i$ *for all* $i \in N$.

Hence $PC(N,w) = \{X\}$. Since σ satisfies NE and $\sigma(N,v) \subseteq PC(N,v)$, then $\sigma(N,w) = \{X\}$.

Let $u = v - w$ such that $(N,u) \in G_{PC}^\nu$.

Note that $u(\{i\}) = v(\{i\}) - w(\{i\}) = 0$ *for all* $i \in N$ *and* $u(N) = v(N) - w(N) = 0$.

Also, $u(S) = v(S) - w(S) = v(S) - X^S \leq 0$ *for all* $S \subseteq N$ *with* $|S| \geq 2$, *and* $S \neq N$.

Hence $PC(N,v) \subseteq \sigma(N,v)$.

Case 2: Let $n \leq 2$.

If *n* = 1, then $X \in \sigma(N,v)$ by NE and IR. So we assume that *n* = 2. Let $N = \{i, j\}$.

Let $k \notin N$ and let $M = \{i, j, k\}$. Define $(M,u) \in G_{PC}^\nu$ as follows.

$$u(S) = \begin{cases} \sum_{l \in S \cap N} v(\{l\}) & if \quad S \neq M; \\ v(N) & if \quad S = M. \end{cases}$$

Let $X = (X^i, X^j) \in PC(N, v)$. Let $Y = (X^i, X^j, X^k)$, where $X^k = \{(0,0,....,0)^t\}$. Since

$Y^N = X^N = v(N) = u(M)$ *and* $Y^S = \sum_{l \in S \cap N} X^i \leqq \sum_{l \in S \cap N} v(\{l\}) = u(S)$ *for all* $S \subset M$.

Thus, $Y \in PC(M, u)$.

As $|M| = 3, PC(M, u) \subseteq \sigma(M, u)$. Thus, $Y \subseteq \sigma(M, u)$.

Finally, we show that $(N, u_Y^N) = (N, v)$. Let $S \subset N$, $S \neq \phi$ be given.

$u_Y^N(S) = V_{Q \subseteq M \setminus N}^{\max}(u(S \cup Q) - Y^Q) = u(S \cup \{k\}) - Y^k = u(S \cup \{k\}) = v(S)$.

Further, $u_Y^N(N) = u(M) - Y^k = u(M) = v(N)$.

Hence by WRGP, $X \in \sigma(N, u_Y^N) = \sigma(N, v)$, and thus $PC(N, v) \subseteq \sigma(N, v)$ .This completes the proof of the theorem.

Now we give the examples to show that the axioms that characterize the preference core are mutually independent.

Example 4.1 For all $(N, v) \in$, $\mathcal{G}^v$, . Then, σ satisfies IR, SUPA and WRGP but violates NE.

Example 4.2 For all $(N, v) \in \mathcal{G}_{PC}^v$, let $\sigma(N, v) = PC(N, v)$ *if* $|N| \geq 2$,

and let $\sigma(\{i\}, v) = X^i$ *where* $X \in R^{m \times n}$ such that $X^i \leqq v(\{i\})$ *for all* $i \in N$.

Then σ satisfies NE, SUPA and WRGP but violates IR.

Example 4.3 For all $(N, v) \in \mathcal{G}_{PC}^v$, let $\sigma(N, v) = \{X \in X^*(N, v): X^i \geqq v(\{i\})\}$ *for all* $i \in N\}$. Then σ satisfies NE, IR and SUPA. By Lemma 4, it fails to satisfy WRGP.

Example 4.4 For all $(N, v) \in \mathcal{G}_{PC}^v$, $\sigma(N, v) = \mathcal{GN}$, *where* $\mathcal{GN}$ is the generalized nucleolus defined on $\mathcal{G}_{PC}^v$. This cost allocation rule satisfies NE, IR and WRGP but violates SUPA.

5. CONCLUDING REMARKS

In recent times, the multicriteria game techniques are analyzed more rapidly. This advancement allows us to address axiomatization of preference core. For multicriteria games, many types of core solution concepts are available in literature. In this paper, we consider only the preference core. We proved that the preference core satisfies non-emptiness, individual rationality, Pareto optimality, superaddivity reduced game property, weak reduced game property and converse reduced game property. We axiomatized the preference core based on some of the above mentioned properties.

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CORPORATE GOVERNANCE & INFORMATION SECURITY: AN ANALYTICAL STUDY

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ABSTRACT

Corporate governance plays a very important role within corporations. We had a series of scandals that affected public companies, governance and related legislation. It is important to understand corporate governance as an information security professional, particularly to prepare for questions or audits of information technology and security resources. In fact organizations are looking at the implications of their overall Corporate Governance strategy. Examination has led to an understanding that information security as not just a technical issue. It is a **Corporate Governance** issue implemented and enforced across all levels of the organization.

KEYWORDS

Security, Transparency, Policies, Risk assessment, legislation.

DEFINITIONS OF INFORMATION GOVERNANCE

Because information governance is a relatively new concept, there is no standard definition as of yet. Gartner Inc., an information technology research and advisory firm, defines information governance as the specification of decision rights and an accountability framework to encourage desirable behavior in the valuation, creation, storage, use, archival and deletion of information. It includes the processes, roles, standards and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals.

As defined by information governance solutions provider RSD S.A., IG enforces desirable behavior for the creation, use, archiving, and deletion of corporate information.

To technology and consulting corporation IBM, information governance is a holistic approach to managing and leveraging information for business benefits and encompasses information quality, information protection and information life cycle management.

Regardless of the exact wording, definitions of IG tend to go quite a bit further than traditional Records management in order to address all phases of the information life cycle. It incorporates privacy attributes, electronic discovery requirements, storage optimization, and metadata management. In essence, information government is the superset encompassing each of these elements.

HISTORY

Records Management and Information Governance Records management deals with the retention and disposition of records. A record can either be a physical, tangible object, or digital information such as a database, application data, and e-mail. The lifecycle was historically viewed as the point of creation to the eventual disposal of a record. As data generation exploded in recent decades, and regulations and compliance issues increased, traditional records management failed to keep pace. A more comprehensive platform for managing records and information became necessary to address all phases of the lifecycle, which led to the advent of information governance.

In 2003 the Department of Health in England introduced the concept of broad based information governance into the National Health Service, publishing version 1 of an online performance assessment tool with supporting guidance. The NHS IG Toolkit is now used by over 30,000 NHS and partner organizations, supported by an e-learning platform with some 650,000 users.

In 2008, ARMA International introduced the Generally Accepted Recordkeeping Principles®, or "The Principles" and the subsequent "The Principles" Information Governance Maturity Model. "The Principles" identify the critical hallmarks of information governance. As such, they apply to all sizes of organizations, in all types of industries, and in both the private and public sectors. Multi-national organizations can also use "The Principles" to establish consistent practices across a variety of business units. ARMA International recognized that a clear statement of "Generally Accepted Recordkeeping Principles" ("The Principles") would guide:

CEOs in determining how to protect their organizations in the use of information assets, Legislators in crafting legislation meant to hold organizations accountable, and Records management professionals in designing comprehensive and effective records management programs.

Information governance goes beyond retention and disposition to include privacy, access controls, and other compliance issues. In electronic discovery, or e-discovery, electronically stored information is searched for relevant data by attorneys and placed on legal hold. IG includes consideration of how this data is held and controlled for e-discovery, and also provides a platform for defensible disposition and compliance. Additionally, metadata often accompanies electronically stored data and can be of great value to the enterprise if stored and managed correctly.

In 2011, the Electronic Discovery Reference Model (EDRM) — in collaboration with ARMA International — published a white paper that describes How the Information Governance Reference Model (IGRM) Complements ARMA International's Generally Accepted Recordkeeping Principles ("The Principles"). With all of these additional considerations that go beyond traditional records management, IG emerged as a platform for organizations to define policies at the enterprise level, across multiple jurisdictions. IG then also provides for the enforcement of these policies into the various repositories of information, data, and records.

ORGANIZATIONAL STRUCTURE

In the past, records managers owned records management, perhaps within a compliance department at an enterprise. In order to address the broader issues surrounding records management, several other key stakeholders must be involved. Legal, IT, and Compliance tend to be the departments that touch information governance the most, though certainly other departments might seek representation. Many enterprises create information governance committees to ensure that all necessary constituents are represented and that all relevant issues are addressed.

TOOLS

To address retention and disposition, Records Management and Enterprise Content Management applications were developed. Sometimes detached search engines or homegrown policy definition tools were created. These were often employed at a departmental or divisional level; rarely were tools used across the enterprise. While these tools were used to define policies, they lacked the ability to enforce those policies. Monitoring for compliance with policies was increasingly challenging.

Because information governance addresses so much more than traditional records management, several software solutions have emerged to include the vast array of issues facing records managers. Some of these vendors include Collibra, Open Text Corporation, RSD, HP's Autonomy, EMC Corporation, and IBM. One of the most widely used tools is the NHS Information Governance Toolkit used by over 30,000 organizations in England.

LAWS AND REGULATIONS

Key to IG is the regulations and laws that help to define corporate policies. Some of these regulations include: The Foreign Account Tax Compliance Act, or FATCA, Payment Card Industry Data Security Standard, or PCI Compliance.

This explanation of the governance term draws attention to the outcome, or results, of oversight operations. The result of company operations are that, if a strategic decision is made one way or another,

In addition to inferring these questions, the definition addresses the issue at hand for information security professionals; how can the information within a corporation be maintained and trusted and how can wrongdoing be prevented or detected. A key goal for information security professionals involves the protection of corporate information from improper access or modification. This is similar to the goal of the financial reporting process and, in fact, a part of the financial reporting process includes a role played by the information security function.

Topics of governance are chiefly concerned with the operation of the board of directors of a corporation. The board is responsible for the following

- Fiduciary Oversight – ensures that the corporation has the appropriate processes and controls in place, selects and works with the external auditing firm, generally monitors the corporation as it attempts to meet financial goals.
- CEO Selection and Succession Planning – The board of directors hires the CEO, not the other way around. As such, the board must monitor the CEO and ensure that his/her actions and intentions are in the best interests of shareholders.
- Strategic Planning – Although a constant process, the official strategic plan for the corporation should be reviewed by the board at least annually. Throughout the year the board should revisit the plan to ensure that the corporation is headed in the right direction.
- Equity Policy – Plan for the distribution of stock equity among executives as well as to line employees, if applicable. Ensure that equity plans are in line and related to overall corporate financial performance.

The board of directors is led by the chairman, normally numbers from eight to twelve total members, and each member is assigned to one or more committees that are divided up among the entire board. The audit, compensation, and corporate governance committee must be made up of board members who are independent of the firm (non-employees). Understanding the makeup of a firm's board can help in dealing with requests that arise from board discussions.

Generally, governance deals with the core aspects of the business and how their context can be made transparent for stakeholders of the corporation. The term "transparent" is continually referred to within governance discussions and refers to the ability of the company board, investors and stakeholders to understand the key drivers, metrics and risks that exist for a corporation as well as how the corporation is fairing in meeting key metrics over time.

INFORMATION SECURITY AND ASSURANCE

Corporations must put safeguards in place through policies, procedures and technology so that the "proverbial zero" isn't erased. However, information security is not a simple topic and certainly doesn't make for interesting cocktail party discussion for most people. This partly explains the disinterest from boards of directors and corporate executives in the past. Explanation for the remainder of disinterest is grounded in a revenue-side focus and an ignorance of the costs associated with aggregated risk and actual loss. Financial scandals have changed the situation, whereby executives and boards are now very interested in the controls and procedures that are in place to prevent fraud, control loss and keep operations continuing. The focus is again on corporations to explain how they organize and implement internal controls for all systems related to financial reporting, and there are those that call for the controls to go much further than just financial reporting.

Preparation for Participation in the Governance Process a CIO, CISO or other professional involved with the management of information security must be prepared to play a part in the corporate governance process. The initial step in preparing for a part in the governance process is refreshing knowledge and understanding of corporate governance. Being able to provide a definition and participate in general discussions regarding governance will help to foster further inquisition into the related issues. In addition to the corporate governance definition, it helps to consider all the players involved in corporate governance scenarios. Everyone involved with the company plays a part, but in particular are auditors, the board of directors, investment banks, and the corporate executive management. Once familiar with the general issues and practices of overall governance, the next task is to make sure that information security management and practices are in line with the expectations of good governance. Just as the overall corporation is to be transparent, with processes and checks to ensure good financial reporting, so should the information security organization exercise similar Transparency.

Transparency in information security and information technology comes down to having good processes, knowing how and why they work, documenting them thoroughly, and reporting on the result. That's transparency. It allows other groups, those who aren't systems administrators, to understand how the program is working. The audit committee, the CFO, the Board of Directors may someday ask to understand the status of backups; with the metrics in place you'll have the answers. Document retention is also an area that is at the top of the list for audit committees and the corporate legal team. A recent CIO article notes "enforcing document destruction policies could be a different way of thinking to a CIO whose mantra is backup, backup, backup." However, just as backups are to be run with precision processes, so is document retention. This means having the process and technology in place to identify date by type, and properly determine its content and age. Then, according to the corporate document retention plan, data no longer within the policy should be properly destroyed. A bit of a misnomer, to an IT worker, a retention policy has more to do with destruction than retention, since that's the part that is new. If there isn't an official document retention policy in place, it's time to get the corporate counsel together and create one. A good explanation of the factors involved and the process for creating such a policy is described in a paper by Jay G. Martin entitled "Developing an Effective Document Retention Policy" This document leads an information security professional through the process, including working with corporate legal and executive management in getting the policy approved, an absolutely critical step.

With the plan in place, just as with backups, the key metrics and the methods for monitoring them need to be established and implemented. Here again, when the day comes when you're asked for the status of the document retention plan, the necessary data, and maybe even some pretty graphs. Backups and document retention are just two examples of keys areas that are within sights of the corporate audit committee, the board of directors, and definitely executive IT management. The same philosophy applies to all parts of information security and technology. Even if the day never comes when a board member tests the waters by asking for status on a specific information security or technology program, your overall performance in the areas will be all the better for the added process review and tracking. Preparing for taking part in the governance process comes down to two key items. First, be familiar with governance, the people

involved, the issues at hand, and the goals for all involved. Next, get your house in shape and apply the same "transparency" to information security and technology as is applied to the corporation as a whole. Finally, have the processes and metrics of the organization reviewed by an outside party. In many cases this means an outside security review by an independent auditor. However, don't just settle for the standard set of scripts and questions that an IT/IS auditor brings along, have them audit your specific set of processes and metrics that have been devised. Ask that they review and provide information about the format, content, and implementation of the processes that are already in place. Having a third party review the plans and their overall implementation is a perfect way to get new ideas as well as determine the efficacy of the changes.

FRAMEWORK FOR INFORMATION SECURITY & TECHNOLOGY TRANSPARENCY

As noted above, one of the most significant outcomes of recent governance events was the introduction of the Sarbanes-Oxley legislation, and in particular, section 404 of the legislation which covers internal controls. The section on internal control requires that systems storing or processing corporate financial information have appropriate controls in place to safeguard such information. What is appropriate and what the controls should cover has been argued and debated for much of the past two years. Without arguing the points here, there is still much to be gained from the resources put in place as a result of the legislation. The requirement has been most recently defined as "appropriate controls for systems and processes used in the financial reporting process", a much tighter definition. Even so, a lot of the resources that were put together to fit a much broader requirement provide a very useful framework to be applied in a variety of situations. Most notably for IT environments is the Control Objectives for Information and related Technology from the IT Governance Institute, otherwise referred to as the "CobiT". These resources provide a starting point of control objectives in the COSO framework. The COSO framework was developed as a method for identifying risk and documenting controls for corporate processes, both manual and automated. CobiT takes the COSO framework and begins to fill in control information that would be appropriate for most organizations. The framework is a useful resource as an implementation of full COSO is a rather intense undertaking. The CobiT guidelines run through a step-by-step process outlined as follows:

1**. Plan and Scope** – Establish a team to coordinate and guide the process. Learn about the financial reporting processes, as well as other key business processes. Define which business processes are critical, and will be included, in at least the first run of the project.

2. **Risk Assessment** – Identify the areas that exhibit potential for problem. Assess and rate each with a "likelihood" and "impact" rating.

3. **Accounts & Control Review** – Inventory existing controls and accounts within systems and processes that are the target of the project.

4. **Documentation Design** – Although there is not specific guidance as part of most frameworks, the CobiT provides a base to work from.

5. **Control Design** – Critical to the success of a control program, this step evaluates the ability of the organization and its processes to enforce a particular control. Key issues are what other controls any given control will be dependent on, or what personnel or processes must be involved for the control to succeed.

6. **Current Operations Audit** – For each control, identify what state the control is currently in. Some will be "non-existent", others may be "Managed and Measurable".

7. **Identify Weaknesses** – Considerable professional judgment comes to play in this step where shortcomings should be defined as either "deficiencies" or "weaknesses", based on whether the issue is likely to subvert the control, or in a financial environment, result in the misstatement of an organization's financial records.

8. **Document Results** – It's just as important to document the test results as it is to document the tests. Having documentation of the outcome of tests will provide the records required for auditors, or to go into further detail with others.

9. **Build Sustainability** – Review the full program at this point and ensure that it is sustainable into the future. Controls are not a onetime event, but a continuous process.

In addition to the process guidelines, the CobiT materials go into additional detail, making it much easier to create an effective program without having to re-invent the wheel. The CobiT materials are extremely informative, yet there are other materials available, and more are likely to become available in the future.

CONCLUSION

Corporate governance is again a key for legislation, investment, and execution. Information security professional should be responsible in dealing with the issues and should be aware in providing the related information. Recent experiences have revealed that there is much to be done to bring back investor's confidence in current corporation world. The situation continues to change; even recently key regulations were further relaxed from their initial "knee-jerk" reaction. However, as a manager responsible for information security it is important to be prepared by being familiar with corporate governance concepts, setting up transparency in operations, and adopting a structured framework for analysis and documentation.

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RUPEE FALLING: DOLLAR IS ON HORSE RIDE

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ABSTRACT

For the last couple of months, Indian rupee has become the worst performing Asian currency against the dollar. Indian currency is performing worst among all the major emerging economies. In the first week of July 2013, it crossed the psychological barrier of Rs. 60 and reached to an all time high of Rs.61 to the dollar. The Indian Rupee has depreciated to an all time low with respect to the US Dollar. We are experiencing a tough time with Rupee depreciation every day. The Indian rupee touched a lifetime low of 68.85 against the US dollar on August 28, 2013. The rupee plunged by 3.7 percent on the day in its biggest single-day percentage fall in more than two decades. Since January 2013, the rupee has lost more than 20 percent of its value, the biggest loser among the Asian currencies. *Several factors like the slowing economy, rising inflation, around 5% fiscal deficit and a high current account deficit, have been blamed for the rupee depreciation. However, there are many other reasons thriving in the picture. This paper attempts to give insight into depreciation of the rupee and enables the readers to know the valid as well as probable reasons behind the rupee falling. Other side this paper also touches upon measures to be taken to arrest the rupee falling. Primarily this papers covers rupee movements over the years. Secondly, talks about reasons for rupee depreciation with statistical evidences. Lastly, this paper suggests remedies to be taken to arrest the Rupee fall against Dollar.*

KEYWORDS

Economy, depreciation, plunged, inflation, fiscal deficit, current account.

INTRODUCTION

The underlying objective of this study is to find out the dynamics, forces causing rupee falling in the exchange rate of Indian rupee against dollar and remedies to be taken to control the depreciation of rupee. Exchange rates play a dominant role in a country's level of trade that is crucial to almost every free market economy in the world. Therefore, exchange rates are closely studied analyzed and governmentally manipulated economic measures. Exchange rate influences the return of the individual investors, institutional investors, profitability of the firm, growth of specific sectors, and economy of the given country at a large.

LITERATURE REVIEW

Most previous researches about the behavior of exchange rates have been devoted to explain and forecast exchange rate levels and not their volatility. Several structural models have been suggested to capture the pattern of exchange rates, such as monetary exchange rate models and portfolio balance models. However, none of these models was able to outperform a naive random walk model in forecasting in sample exchange rate (see, for instance, Meese and Rogoff, 1983).

Simon (1997) found that exchange rate and current account have direct and positive relationship with inflation and both exchange rate and current account are the key factors that badly affect the small economies.

Edwards (2000) investigated the dynamic association between exchange rate regimes, capital flows and currency crises in emerging economies. The study draws on lessons learned during the 1990s, and deals with some of the most important policy controversies that emerged after the Mexican, East Asian, Russian and Brazilian crises. He concludes that under the appropriate conditions and policies, floating exchange rates can be effective and efficient.

Harberger (2003) studied the impact of economic growth on real exchange rate. He found that there is no systematic connection between economic growth and real exchange rate.

Due and Sen (2006) examine the interactions between the real exchange rate, level of capital flows, volatility of flows, fiscal and monetary policy indicators and the current account surplus for Indian economy for the period 1993Q2 to 2004Q1. The estimations indicate that the variables are co integrated and each Granger causes to the real exchange rate.

The principal aim of this study is to find out the dynamics, forces causing rupee falling in the exchange rate of Indian rupee against dollar and remedies to be taken to control the depreciation of rupee. Exchange rates play a dominant role in a country's level of trade that is crucial to almost every free market economy in the world. Therefore, exchange rates are closely studied analyzed and governmentally manipulated economic measures. Exchange rate influences the return of the individual investors, institutional investors, profitability of the firm, growth of specific sectors, and economy of the given country at a large.

METHODOLOGY

This research has been carried out in order to investigate the impact of various macroeconomic variables on the volatility of foreign exchange rate. The research is based on secondary data, to compile the report with some variables ten years annual data for the period of 2000 till date was collected. The relationship between Exchange rate and Macro-economic variables such as, foreign remittances, Balance of trade, current accountant, Foreign Direct Investment, GDP etc. has been analyzed with the help of statistical data and graphs.

THE RUDIMENTS OF RUPEE

The Indian currency has witnessed a slippery journey since Independence. Many geopolitical and economic developments have affected its movement in the last 66 years. When India got freedom on August 15, 1947; the value of the rupee was on a par with the American dollar. There were no foreign borrowings on India's balance sheet. To finance welfare and development activities, especially with the introduction of the Five-Year Plan in 1951, the government started external borrowings. This required the devaluation of the rupee.

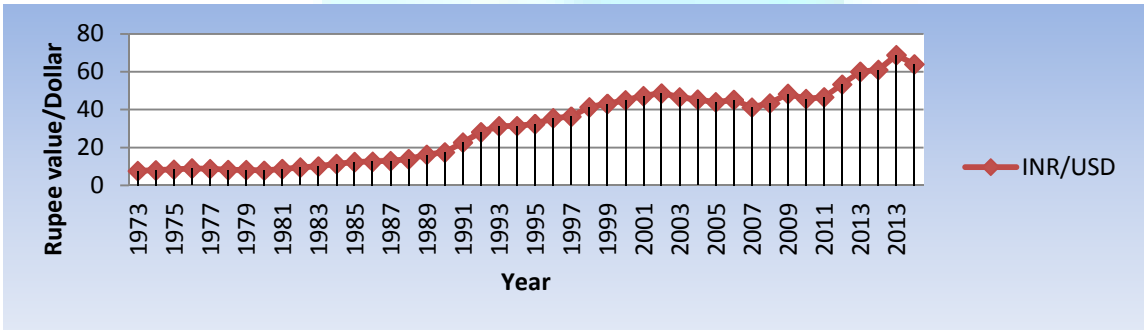
After independence, India had chosen to adopt a fixed rate currency regime. The rupee was pegged at 4.79 against a dollar between 1948 and 1966.Two consecutive wars, one with China in 1962 and another one with Pakistan in 1965; resulted in a huge deficit on India's budget, forcing the government to devalue the currency to 7.57 against the dollar. The rupee's link with the British currency was broken in 1971 and it was linked directly to the US dollar. In 1975, value of the Indian rupee was pegged at 8.39 against a dollar. In 1985, it was further devalued to 12 against a dollar.

In 1991, India faced a serious balance of payment crisis and was forced to sharply devalue its currency. The country was in the grip of high inflation, low growth and the foreign reserves were not even worth to meet three weeks of imports. Under these situations, the currency was devalued to 17.90 against a dollar.1993 was very important. This year currency was let free to flow with the market sentiments. The exchange rate was freed to be determined by the market, with provisions of intervention by the central bank under the situation of extreme volatility. This year, the currency was devalued to 31.37 against a dollar. The rupee traded in the range of 40-50 between 2000 and 2010.It was mostly at around 45 against a dollar. It touched a high of 39 in 2007.The Indian currency has gradually depreciated since the global 2008 economic crisis.Liberalising the currency regime led to a sharp jump in foreign investment inflows and boosted the economic growth.

Value of Rupee against Dollar since 1973 till date

Year	INR/USD	YEAR	INR/USD	YEAR	INR/USD
1973	7.66	1988	13.91	2003	46.6
1974	8.03	1989	16.21	2004	45.28
1975	8.41	1990	17.5	2005	44.01
1976	8.97	1991	22.72	2006	45.17
1977	8.77	1992	28.14	2007	41.2
1978	8.2	1993	31.26	2008	43.41
1979	8.16	1994	31.39	2009	48.32
1980	7.89	1995	32.43	2010	45.65
1981	8.68	1996	35.52	2011	46.61
1982	9.48	1997	36.36	2012	53.34
1983	10.11	1998	41.33	2013	60
1984	11.36	1999	43.12	2013	61
1985	12.34	2000	45	2013	68.85
1986	12.6	2001	47.23	2013	63.99
1987	12.95	2002	48.62		

Average annual currency exchange rate for the Indian Rupee (Rupees per U.S. Dollar) is shown in this table: 1973 till date.



HOW IS THE VALUE OF RUPEE IS DETERMINED AGAINST DOLAAR

Typically, the value of a currency against another is decided based on demand. If people buy the currency, the currency becomes stronger and vice-versa. The same thing holds for the dollar and the rupee rate. As with other commodities, **market forces** of **demand and supply** are the major determinants of the value of rupee against the dollar. In a scenario, when the demand for dollar witnesses an uptrend, the value of rupee in its respect depreciates, which consequently lowers the purchasing power of the rupee. Current value of rupee that stands at nearly 63 against the dollar can be used to explain strength of the domestic currency against the dollar. The domestic currency value has depreciated considerably as now 63 rupees are required to buy an amount equivalent to 1$.

THEORIES OF CURRENCY

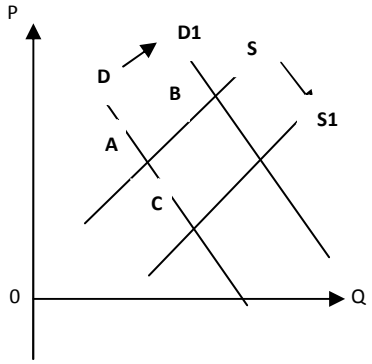
Many theories there have been written in respect to the main determinant of future exchange rates. Although the majority of these theories give adequate reasons in order to explain what actually determines the rates between the currencies, we can argue that there are many factors that may cause a currency fluctuation. Consequently, there is little that can be alleged in respect to the theory that better answers the question of what finally determines the exchange rates.

Here below, we will refer to the main theories regarding the determinants of the exchange rates.

SUPPLY AND DEMAND

As stated earlier, the exchange rate, just like commodities, determines its price responding to the forces of supply and demand8. Therefore, if for some reason people increase their demand9 (shift of the curve from D to D1) for a specific currency, then the price will rise from A to B, provided the supply remains stable. On the contrary, if the supply10 is increased (shift of the curve from S to S1), the price will decline from A to C, provided the demand remains stable (figure P1).

FIGURE P 1: SUPPLY AND DEMAND FOR FOREIGN CURRENCY



P: shows the exchange rate, Q: shows the mount of currency demanded and supplied
A, B, C: Show the equilibrium exchange rate
Any excess supply (above the equilibrium point) or excess demand (below the equilibrium point) will increase or decrease temporarily foreign currency reserves accordingly. Finally, such disequilibrium situations will be eliminated through the pricing, e.g. the market itself.

PURCHASING POWER PARITY (PPP)

By definition the PPP states that using a unit of a currency, let us say one euro, which is the purchasing power that can purchase the same goods worldwide. The theory is based on the 'law of one price', which argues that should a euro price of a good be multiplied by the exchange rate (€ /US$) then it will result in an equal price of the good in US dollars. In other words, if we assume that the exchange rate between the € and US $ states at 1/1.2, then goods that cost € 10 in the EU should cost US$ 12 in the United States. Otherwise, arbitrage11 profits will occur.

However, it is finally the market that through supply and demand will force accordingly the euro and US dollar prices to the equilibrium point. Thus, the law of one price will be reinstated, as well as the purchase power parity between the euro and US dollar. Inflation differentials between countries will also be eliminated in terms of their effect on the prices of the goods because the PPP will adjust to equal the ratio of their price levels12. More specifically, as stated in their book (Lumby S. & Jones C. 1999) "the currency of the country with the higher rate of inflation will depreciate against the other country's currency by approximately the inflation deferential".

In conclusion, it can be argued that the theory, although it describes in a sufficient way the determination of the exchange rates, is not of good value, mainly because of the following two disadvantages. Firstly, not all goods are traded internationally (for example, buildings) and secondly, the transportation cost should represent a small amount of the good's worth.

THE BALANCE OF PAYMENTS (BOP) APPROACH

The balance of payments approach is another method that explains what the factors are that determine the supply and demand curves of a country's currency. As it is known from macroeconomics, the balance of payments is a method of recording all the international monetary transactions of a country during a specific period of time. The transactions recorded are divided into three categories: the current account transactions13, the capital account transactions14, and the central bank transactions15.

The aforementioned categories can show a deficit or a surplus, but theoretically the overall payments (the BOP as a whole) should be zero – which rarely happens. As stated earlier, a currency's price depreciation or appreciation (the change in the value of money), directly affects the volume of a country's imports and exports and, consequently, a likely fluctuation in the exchange rates can add to BOP discrepancies.

For example, a likely depreciation will increase the value of exports in home currency terms (the larger the exports demand elasticity the greater the increase). Conversely, the imports will become 'more expensive' and their value will be reduced in home currency (the larger the imports demand elasticity the greater the decrease).

Consequently, we can argue that unless the value of exports increases less than the value of imports, the depreciation will improve the current account. More specifically, we can finally assess the impact of the currency's depreciation on the current account only by considering the price sensitivity of imports and exports.

The **Marshall Lerner** Condition shows that if the sum of the price elasticity of demand for imports and exports is greater than one, then a fall in the exchange rate will improve the current account of BOP.

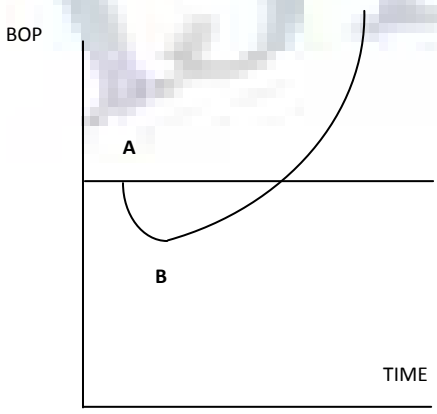
Hx + Hm > 1

Hx: Price elasticity of exports volumes

Hm: Price elasticity of import volumes

The **J curve effect** illustrates that in the short-term a depreciation of the currency can initially worsen (from A to B) the current account balance before it improves its position (figure P2). This is due to the low price elasticity of demand for imports and exports in the immediate outcome of an exchange rate change.

FIGURE P 2: THE J CURVE EFFECT



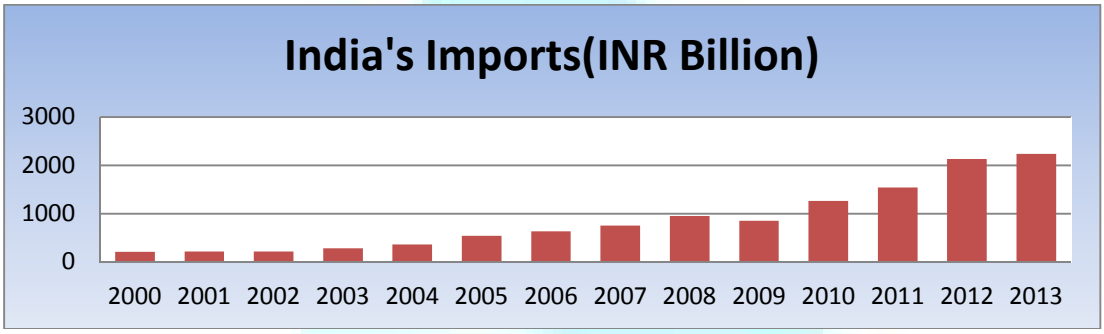
WHY VALUE OF INDIAN RUPEE IS FALLING?

INCREASING IMPORTS

Imports in India increased to 2342.13 INR Billion in August of 2013 from 2277.60 INR Billion in July of 2013. India Imports averaged 377.71 INR Billion from 1978 until 2013, reaching an all time high of 2475.94 INR Billion in January of 2013 and a record low of 4.98 INR Billion in April of 1978. India is heavily dependent on coal and foreign oil imports for its energy needs. Other imported products include: machinery, gems, fertilizers and chemicals. India's main import partners are China (12 percent of total imports), United Arab Emirates, Switzerland, Saudi Arabia, United States, Iraq and Kuwait. This excess imports results in more demand for foreign currency and value of Dollar is tremendously rising.

Year	Imports (INR Billion)
2000	212.33
2001	215.63
2002	216.04
2003	280.62
2004	361.67
2005	540.42
2006	636.72
2007	754.45
2008	951.34
2009	850.22
2010	1261.75
2011	1541.72
2012	2129.92
2013	2239.52

The above table shows the imports in INR Billion by the end of March every year from 2000 till date. Source: www.tradingeconomics.com, www.rbi.org.in.

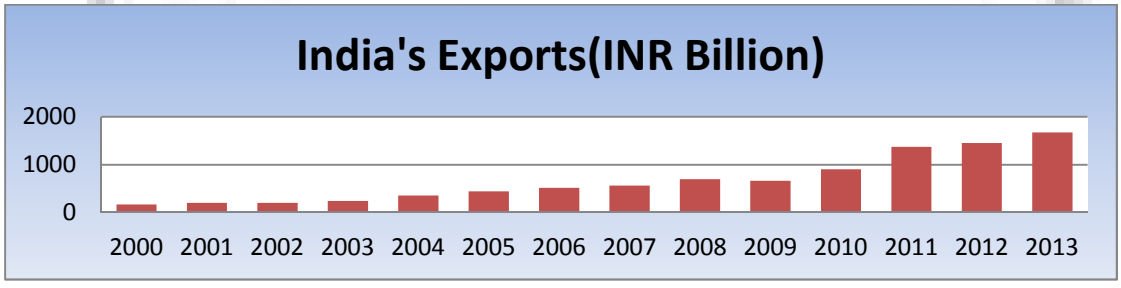


LOW EXPORTS BASE

Exports in India increased to 1652.02 INR Billion in August of 2013 from 1544.27 INR Billion in July of 2013. India Exports averaged 253.15 INR Billion from 1978 until 2013, reaching an all time high of 1672.52 INR Billion in March of 2013 and a record low of 3.75 INR Billion in May of 1978. India's main exports are engineering goods (19 percent of total exports), gems and jewelry (15 percent), chemicals (13 percent), agricultural products (9 percent) and textiles (9 percent). India is also one of Asia's largest refined product exporters with petroleum accounting for around 18 percent of total exports. India's main export partners are United Arab Emirates (12 percent of total exports) and United States (11 percent). Others include: China, Singapore, Hong Kong and Netherlands. India's exports are confined to some set of products as mentioned above as well as the portion of the imports is always more against the exports.

Year	Exports (INR Billion)
2000	168.23
2001	200.89
2002	201.82
2003	245.41
2004	353.96
2005	443.67
2006	514.26
2007	566.28
2008	696.3
2009	661.69
2010	905.73
2011	1368.57
2012	1451.23
2013	1672.52

The above table shows the exports in INR Billion by the end of March every year from 2000 till date. Source: www.tradingeconomics.com, www.rbi.org.in.

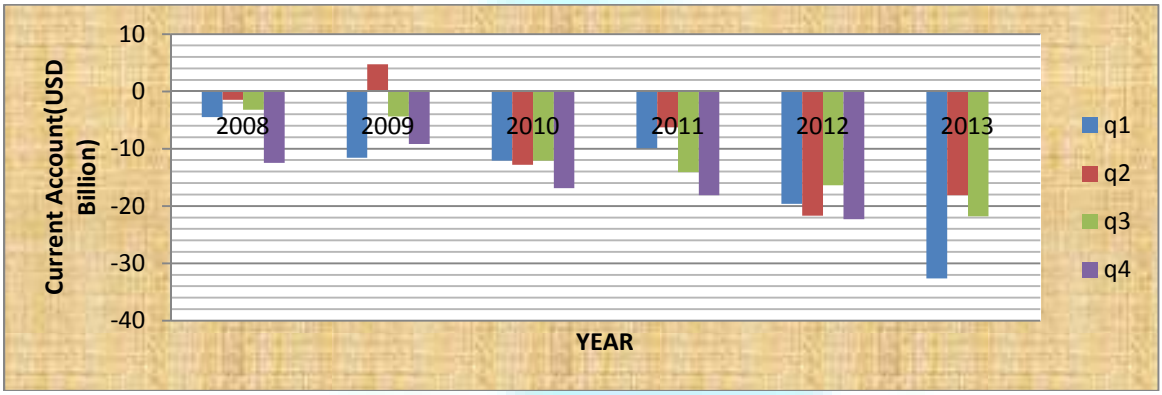


Growing current A/C deficit (CAD) - In simple terms, it refers to the difference between the export bill and the import bill. When import bill exceeds exports, we term it as deficit. When CAD increases i.e (imports increase), it tends to mount pressure upon rupee (as there is more demand of dollars in the market to settle the import bills), as a result of which value of rupee depreciates.

India recorded a Current Account deficit of 18.10 USD Billion in the first quarter of 2013. India Current Account averaged a deficit equivalent to 1.51 USD Billion from 1949 until 2013, reaching the best surplus at 7.36 USD Billion in March of 2004 and the worst deficit at 32.63 USD Billion in December of 2012. Current Account is the sum of the balance of trade (exports minus imports of goods and services), net factor income (such as interest and dividends) and net transfer payments (such as foreign aid).

	India's Current Account(USD Billion)			
year	q1	q2	q3	q4
2008	-4.5	-1.5	-3.2	-12.5
2009	-11.6	4.7	-4.4	-9.2
2010	-12.1	-12.8	-12.1	-16.9
2011	-9.9	-6.3	-14.1	-18.1
2012	-19.6	-21.7	-16.4	-22.3
2013	-32.63	-18.1	-21.8	0

The above table shows the current account in USD Billion by the end of each quarter every year from 2008 till date. Source: www.tradingeconomics.com, www.rbi.org.in.

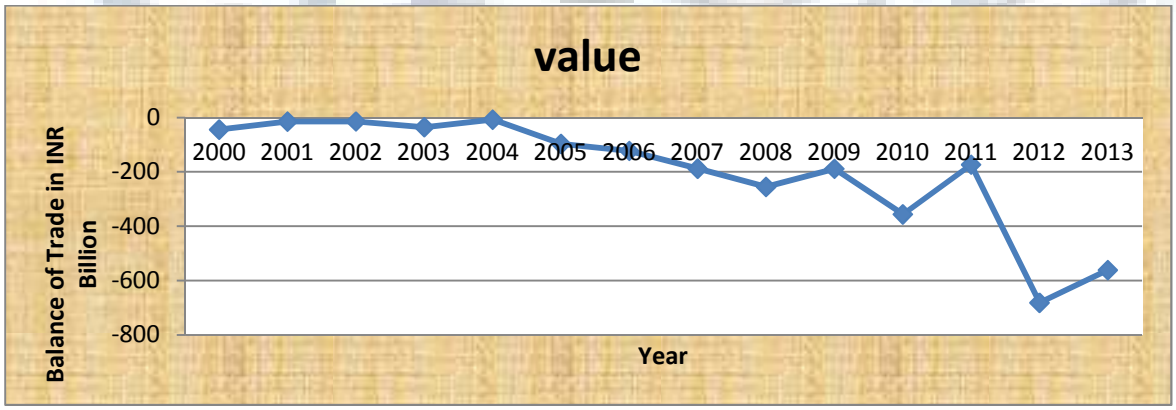


POOR BALANCE OF TRADE

India recorded a trade deficit of 690.11 INR Billion in August of 2013. India Balance of Trade averaged -124.08 INR Billion from 1978 until 2013, reaching an all time high of 13.91 INR Billion in April of 1991 and a record low of -1111.46 INR Billion in October of 2012. India had been recording sustained trade deficits due to low exports base and high imports of coal and oil for its energy needs. India is leading exporter of petroleum products, gems and jewelry, textiles, engineering goods, chemicals and services. Main trading partners are European Union countries, United States, China and UAE.

Year	Balance of Trade(INR Billion)
2000	-44.1
2001	-14.74
2002	-14.23
2003	-35.21
2004	-7.71
2005	-96.76
2006	-122.46
2007	-188.17
2008	-255.04
2009	-188.53
2010	-356.02
2011	-173.15
2012	-681.42
2013	-561.19

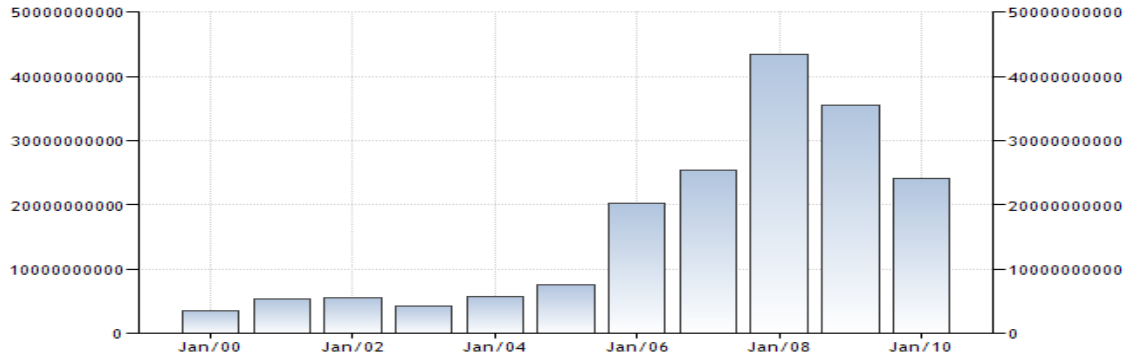
Balance of trade value (INR Billion) is taken by the end of March every year from the year 2000 till date.



F.D.I:- Indian govt has been taking several steps in past to boost F.D.I across sectors in the Indian economy. F.D.I is seen as one of the key factor in boosting a country's economy, as it allows the inflow of foreign exchange (currency) into the country. Except defense sector, F.D.I has been increased up to 100% in several sectors. e.g Multi brand Retail. But, major foreign giants are not taking much interest in the same.The reason according to analysts, lies in the credibility of the govt. Two major political parties in India has held opposite stance on the issue of F.D.I in retail; (one in favor and other in against). Elections are due in May 2014, and investors fear continuity in the policy changes.

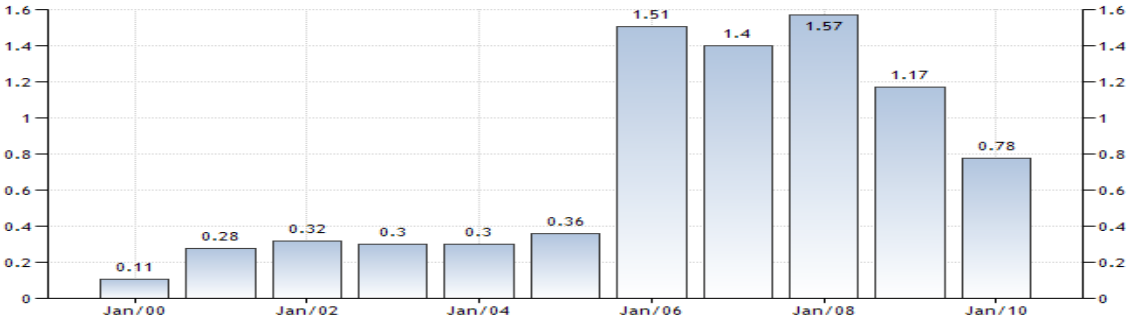
VOLATILITY IN FOREIGN DIRECT INVESTMENT; NET INFLOWS (BoP; US DOLLAR) IN INDIA

The Foreign direct investment; net inflows (BoP; US dollar) in India was last reported at 24159180719.95 in 2010, according to a World Bank report published in 2012. Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors.



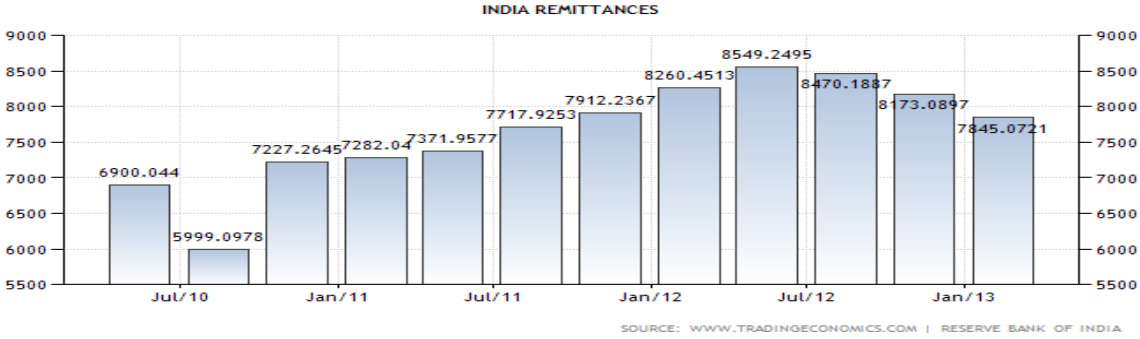
INCREASING FOREIGN DIRECT INVESTMENT; NET OUTFLOWS (% OF GDP) IN INDIA

The Foreign direct investment; net outflows (% of GDP) in India was last reported at 0.78 in 2010, according to a World Bank report published in 2012. Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net outflows of investment from the reporting economy to the rest of the world and is divided by GDP.



FALL IN REMITTANCES

Remittances in India decreased to 7845.07 USD Million in the first quarter of 2013 from 8173.09 USD Million in the fourth quarter of 2012. Remittances in India are reported by the Reserve Bank of India. India Remittances averaged 7657.98 USD Million from 2010 until 2013, reaching an all time high of 8549.25 USD Million in May of 2012 and a record low of 5999.10 USD Million in August of 2010.



Declining GDP- From past few years, India has been registering slowdown in its GDP growth rate. This has been mainly attributed to contraction in mining and manufacturing industry. GDP has been registered to be growing at a rate of 4.4 % in April to June quarter (2013). This has led to low confidence of potential investors in the Indian economy due to which flow of foreign currency (in the form of investments) into the country is declining steadily, leading to depreciation of rupee.

The Gross Domestic Product (GDP) in India expanded 4.40 percent in the second quarter of 2013 over the same quarter of the previous year. GDP Annual Growth Rate in India is reported by the Ministry of Statistics and Programme Implementation. India GDP Annual Growth Rate averaged 5.83 Percent from 1951 until 2013, reaching an all time high of 10.20 Percent in December of 1988 and a record low of -5.20 Percent in December of 1979. In India, the annual growth

rate in GDP at factor cost measures the change in the value of the goods and services produced in India, without counting government's involvement. Simply, the GDP value excludes indirect taxes (VAT) paid to the government and includes the original value of products without accounting for government subsidies.

OTHER FACTORS DETERMING RUPEE FALL

Fear of Increase in oil price: - The Price of crude Brent oil (from which Petrol is extracted) in the international market has reached $116 per barrel (28th Aug 2013) and is heading towards $120 per barrel, due to which there is increase in the fear of rising oil prices. Speculation of U.S attacking on Syria is adding fuel to the fire of rising oil prices. India is a major importer of oil; roughly 80 % of oil is imported in India.Oil imports are settled in US dollars in India, now as price of crude is rising in international market, in order to pay the import bill of crude oil, Indian oil firms have to buy dollars by selling Rupee in the international market, as a result of which demand of dollar increases in the Forex market consequently value of rupee decreases.

Food security bill causing rupee fall: - Recently, Food Security bill was passed through Lok Sabha, which has led to the speculation in market that passage of Food Security Bill will add pressure on the reserves thereby contributing to Fiscal Deficit. This has hurt the Investors Sentiments, due to which investors are not showing confidence in Indian Economy.

There is another factor that can put pressure on the rupee. In a particular year when the government is not able to procure enough rice or wheat to fulfil its obligations under right to food security, it will have to import these grains. But that is easier said than done, specially in case of rice. "Rice is a very thinly traded commodity, with only about 7 per cent of world production being traded and five countries cornering three-fourths of the rice exports. The thinness and concentration of world rice markets imply that changes in production or consumption in major rice-trading countries have an amplified effect on world prices," a CACP research paper points out. And buying rice or wheat internationally will mean paying in dollars. This will lead to increased demand for dollars and pressure on the rupee.

Running F.I.I's:- Foreign Institutional Investors (F.I.I)are not showing confidence in Indian economy, due to political Instability, Increase in number of scams, and improving (recovering)US economy, F.I.I's are withdrawing from Indian markets and diverting their investments into the US market.

Increasing coal imports :- Due to Coal Allocation Scam (Popularly known as Coal gate Scam), Supreme Court suspended the previous allocation of Coal Blocks due to which, despite having abundant Coal reserves in India, we had to import coal, which led to outflow of Forex reserves which added to CAD woes.

Connection between rupee depreciation and general elections: Historical data reveals that there is a certain connection between rupee depreciation and general elections. In most general election years except 2004, the rupee depreciated against the dollar. The statistics speak for themselves. "1984 – down 21%; 1989 – down 24%; 1991 – down 22%; 1996 – down 19%; 1998 – down 13%; 1999 – down 14%; 2004 – up 14%; 2009 – down 25%; 2013 (till now) – down 20%." All the evidence pointing to the nature of the rupee's depreciation bears out one thing strongly: that the value of a rupee falls whenever a general election is around the corner. Economists like to explain this phenomenon this way: every government is inclined to spend extra money to satisfy vote banks before an election. So this unproductive expenditure highly influences the rupee to depreciate, forcing the government to intervene to notch up its value. Similarly, the political class starts to bring back its money hidden in foreign lands to fund elections. Due to the weak rupee, they would like to get a higher price for the same amount. That explains why governments like to put on a show of confidence that there is nothing seriously wrong with the plummeting value of the rupee, which is just a transitory phase of volatility that will surely pass off with time.

Performance of dollar with respect to other currencies: The central banks across Japan and countries in the Eurozone have been bringing out a lot of money and this has meant that both Yen and Euro have lost their value. Compared to this the US Federal Reserve is giving hints that it will end the fiscal stimulus so that the dollar becomes stronger with respect to other currencies such as the Indian Rupee at least for the time being. Till now in 2013, the US dollar index has become stronger by 1.91%.

Volatility in the equity market: The equity markets in India have been volatile for a certain period of time. This has put the FIIs into a dilemma as to whether they should be investing in India or not. In recent times their investments have touched an unprecedented level and so if they pull out then the inflow will go down as well. As per a report in Business Today, the international investors in India have withdrawn to the tune of INR 44,162 crore during June 2013 and this is a record amount. This has also created a current account deficit (CAD) that is only increasing, thus contributing significantly to the depreciation of the INR.

REMEDIES TO PREVENT THE FURTHER DEPRECIATION OF RUPEE

1. Government should increase the limit of FDI in the existing sectors as well as encouraging in other sectors such as aviation, retail, telecommunication, radio & broadcasting etc.
2. Government should create a stable political and economic environment in order to make India an attractive destination for foreign investments.
3. Government should raise import duty on gold in order to decrease the domestic demand for gold import.
4. Government and both RBI should take measures to bring down high inflation rates.
5. Government should boost export-intensive sectors and develop import-substituting industries in order to make India less dependent on imports.
6. RBI should sell Forex reserves and buy rupees in an immediate action in order to arrest the further decline in the value of rupees.
7. RBI should hike the interest rates in order to reduce the money supply in the economy.

CONCLUSION

The Indian Rupee has depreciated significantly against the US Dollar marking a new risk for Indian economy. Grim global economic outlook along with high inflation, widening current account deficit and FII outflows have contributed to this fall. RBI has responded with timely interventions by selling dollars intermittently. But in times of global uncertainty, investors prefer USD as a safe haven. To attract investments, RBI can ease capital controls by increasing the FII limit on investment in government and corporate debt instruments and introduce higher ceilings in ECB's. Government can create a stable political and economic environment. However, a lot depends on the Global economic outlook and the future of Eurozone which will determine the future of INR.

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AN ANALYSIS OF INDIAN AUTOMOBILE INDUSTRY: SLOWDOWN AS AN OPPORTUNITY FOR NEW DEVELOPMENT

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ABSTRACT

Automobile Industry is one of the largest markets in the world. Nowadays, automobiles have become the necessity for everyone. There is a huge scope for automobiles in India, but nowadays Indian automobile industry is facing a big problem, i.e., slowdown. The main purpose of this paper is to discuss the reasons for the slowdown in automobile industry. It analyses the changing scenario of automobile industry that influence the purchasing behaviour of consumers. It explains the sales analysis of various automobile companies in India. It also gives the scope for the future and highlights the solution with the help of new trends which should be adopted by the automobile companies to capture the market and increase the sales in future. It also throws the light on the new technologies for automobile sectors.

KEYWORDS
Consumer, Development, Industry, Market, Sales.

INTRODUCTION

No one could ever imagine of car before 1478, when Leonardo da Vinci first designed the "Self-Propelled Car", and today, none of us can imagine our world without that machine, i.e. the automobile. The history of automobile itself expresses about the development that it brought into the world along itself. The Indian Passenger vehicle market is the 7th largest market in Asia and 10th largest market in the world in terms of volume. As per SIAM, passenger vehicles held a 15.07% domestic market share in the year 2011-12. The automobile, as we know it was not discovered in a day or by any single maker. The pasts of the automobile replicate an achievement that took place around the globe. Automobile products are the second principal optional buying made by a consumer, after household acquisition, the affluences of the automobile industry are closely connected with that of the common progress of the economy, not reusable incomes and consumer sureness.

Around 80 years ago, the Indian Automobile Market was nothing because we did not have any automobile manufacturer in India. There were some imported cars in India. After the independence of India, government had started efforts to develop an automobile industry. In the beginning of automobile industry in India, the progress rate was very slow. But now, the situation is relatively different. We have very large market for automobile industry. Currently, India has amongst the lowest vehicle solidities globally at 11 cars per thousand persons and 32 two-wheelers per thousand persons. This is very low as compared to other comparable economies.

The globalization of the auto industry increasingly fosters the formation of new alliances and the entry of new manufacturers. In the context of the auto industry, globalization has never proceeded at a faster pace not only in terms of sourcing of complete products and components, but also in terms of markets. As a result, the cast of players in the world auto industry is ever increasing.

The Indian automobile industry is best segmented as follows:

- Medium and Heavy commercial vehicles (M/HCV)
- Light commercial vehicles (LCV)
- Light utility vehicles (LUV)
- Passenger cars
- Two-wheelers

India is one of the limited markets where small car section growth is as solid as the growth in the superior and luxury car segment. Even passenger car sales in rural areas have been growing while the share of urban areas has been declining.

There are lots of options for transport like motorcycles, cars, SUV, etc for everyone. There are many automobile manufacturers in two wheelers & four wheelers segments. Few major automobile companies are Bajaj, Hero MotoCorp, Maruti Suzuki, Mahindra & Mahindra, Hyundai, Tata Motors, TVS, and Chevrolet etc.

OBJECTIVE OF THE STUDY

The objective of this study is to discuss about the slowdown in Indian automobile industry. It aims to study about the preferences of automobile consumers. The purpose of this study is also to find out the reasons of slowdown and further to discuss about the solutions.

REVIEW OF LITERATURE

Pawan Kumar Goenka, President – Automotive & Farm Equipment Sectors (2013), "The industrial scenario in general and the auto industry in particular have been going through tough and troubled times. Today, the Indian auto industry is facing an extremely challenging situation in the form of a prolonged slowdown. Sales for medium and heavy commercial vehicles have declined for 16 consecutive months, while passenger car sales have declined for eight consecutive months, including the first quarter of FY14."

According to Mr. Jawahar Lal Wadhwa, Independent Automotive Professional (2013), "Within next 5 years, the automotive scene would begin to change to alternative sources of energy, especially to electric systems, hydrogen cells and hybrid usage. USA is currently leading the research and lots of prototype vehicles are already under trials. This may bring in revival of American car industry, which is under distress. China is faster than any economy to absorb or copy this technology."

PC Magazine observed that "a 2012 car could have a system originally designed in 2006 and put into production in 2008 when that model first hit the streets."

In 2012, Tata Motors announced it will invest around $6 billion on developing Futuristic Infantry Combat Vehicles in collaboration with DRDO.

By 2012 market share reports, Maruti holds 37 percent of the Indian passenger car market. The Brand Trust Report published by Trust Research Advisory has ranked Maruti Suzuki in the seventh position in 2011 and the sixth position in 2012 among the most searched brands in India.

According to 'Republic of India', production wise, M&M is one of the largest vehicle manufacturers in India. It is a subsidiary of Indian conglomerate Mahindra Group. Mahindra & Mahindra was ranked 68th in 2011 and 66th in 2012 among Most Trusted Brands among 17000 brands as per the Brand Trust Report. Blue bytes News rated Mahindra &Mahindra as India's second Most Reputed Car Company conducted for the Auto (Cars) Sector launched in April 2012.

According to Mr. Gaurav Pareek, Finance Expert (2013), "As we all know that we have the money to spend in bulk but if we spend it on daily basis it is easily recognized. So companies should provide the petrol services with fixed liter for the years as like as free service and they may adjust the cost of this in insurance or on the cost of vehicle etc. or through any other means".

Mr. Ashish Jain, Sales Professional (2013) said, "Automobile companies should focus on uncovered area (Such as Rural Area bcz of increasing disposable income) and to do New R&D in Engine development which give more millage, which is the need of consumer. By doing this, they can reduce their promotional expense and increase production and they can also control on cost and offer good pricing of their product and attract more consumers"

"The Indian automobile industry which is growing rapidly, is in need of candidates with sound knowledge of physics, systems, tools and the ability to apply themselves to real-life applications", said Dr. Vijayakanthan Damodaran, Engineering Group Manager (Vehicle Performance), General Motors Technical Centre, Bangalore (2012).

"Diwali did not light up sales and most OEMs saw fewer sales as the slowdown begins to bite and consumers stay away from showrooms", Amit Panday reports (2012).

"New potential car buyers are sitting on the fence due to rising diesel prices," said H.V. Kumar, Director at financial advisory firm Crestar Capital.

According to Arun Aravindam, ACG (2013), "A total of 2,968,201 vehicles were sold in India during the first two months of the financial year 2013-14, thus registering a feeble decrease of 0.64% as against same period of 2012-13. The sales stood at 2,987,438 in April-May for 2012."

Planning Commission constituted a Working Group on Automotive Sector for the 12th Five Year Plan (2012-2017) under the chairmanship of Secretary, Department of Heavy Industry. As per the 12th five year plan by the government study make determined efforts to achieve the projected capacity and production of the automobile sector for the 12th plan period 2012-17 which is given as in Table 1.

TABLE 1: PROJECTED CAPACITY AND PRODUCTION BY 2016-17

Segment	Capacity (in no.)	Production (in no.)
Passenger vehicles	9,372,838	6,909,797
Commercial vehicles	2,397,257	1,741,122
Three wheelers	1,746,596	1,416,457
Two wheelers	31,483,904	25,019,509

Source: Report of the Working Group on Automotive Sector for the 12th Five Year Plan (2012-2017)

SALES ANALYSIS OF INDIAN AUTOMOBILE INDUSTRY

At present, there are 19 manufacturers of passenger cars & multi utility vehicles, 14 manufacturers of commercial vehicles, 16 of 2/3 wheelers and 12 of tractors besides 5 manufacturers of engines in India. This includes virtually all the major global Original Equipment Manufacturers (OEMs) and also home grown companies. Today, it is the largest manufacturer of tractors, second largest manufacturer of two wheelers, 5th largest manufacturer of commercial vehicles and the 4th largest passenger car market in Asia. During 2000-11, India exported 2.35 million vehicles to more than 40 countries which included 0.45 million passenger cars and 1.54 million two wheelers. Today, the automobile industry provides direct and indirect employment to 13.1 million people. Table 2 throws the light on sales record of automobile industry for the period of 2005-2013.

TABLE 2: SALES RECORD OF AUTOMOBILE INDUSTRY (2005-13)

Category/ F.Y.	Passenger Vehicles	Commercial Vehicles	Three Wheelers	Two Wheelers	Grand Total
2005-06	1,143,076	351,041	359,920	7,052,391	8,906,428
2006-07	1,379,979	467,765	403,910	7,872,334	10,123,988
2007-08	1,549,882	490,494	364,781	7,249,278	9,654,435
2008-09	1,552,703	384,194	349,727	7,437,619	9,724,243
2009-10	1,951,333	532,721	440,392	9,370,951	12,295,397
2010-11	2,501,542	684,905	526,024	11,768,910	15,481,381
2011-12	2,618,072	809,532	513,251	13,435,769	17,376,624
2012-13	2,428,523	743,798	501,035	13,325,596	16,998,952

Source: Society of Indian Automobile Manufacturers

India sold 2.6mm passenger vehicles in the domestic market and exported 0.5mm passenger vehicles in the year 2011-12 and grew at a 7 year CAGR of 14%.

TABLE 3: SALES TREND OF INDIAN AUTOMOBILE COMPANIES DURING 2011-12 & 2012-13

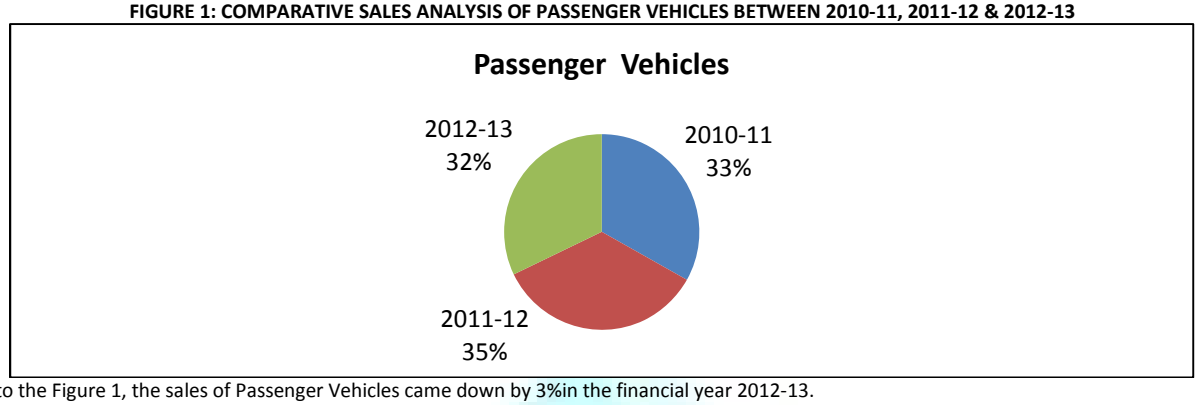
Passenger vehicle segment	Domestic Sales		Growth	Market Share	
	FY 2011-12	FY 2012-13	FY 2012-13	FY 2011-12	FY 2012-13
Maruti Suzuki	1,006,316	1,051,046	4.44%	38.27%	39.12%
Hyundai	388,779	383,611	-1.33%	14.78%	14.28%
Tata	371,350	314,464	-15.32%	14.12%	11.71%
M&M	245,700	310,707	26.46%	9.34%	11.57%
Toyota	160,203	165,504	3.31%	6.09%	6.16%
General Motors	110,050	88,150	-19.90%	4.18%	3.28%
Ford	92,665	77,225	-16.66%	3.52%	2.87%
Honda Cars	54,420	73,483	35.03%	2.07%	2.74%
Volkswagen	78,271	65,465	-16.36%	2.98%	2.44%
Renault	3,666	52,463	1331.07%	0.14%	1.95%
Nissan	33,261	36,955	11.11%	1.26%	1.38%
Skoda	34,089	29,067	-14.73%	1.30%	1.08%
BMW*	9,593	7,221	-24.73%	0.36%	0.27%
Audi*	6,547	6,901	5.41%	0.25%	0.26%
Fiat	16,074	6,933	-56.87%	0.61%	0.26%
Mercedes-Benz*	7,419	5,006	-32.52%	0.28%	0.19%
Hindustan Motors	4,923	5,589	13.53%	0.19%	0.21%
Force Motors	5,234	4,562	-12.84%	0.20%	0.17%
Tata-JLR*	796	1,597	100.63%	0.03%	0.06%
International Cars & Motors	483	260	-46.17%	0.02%	0.01%
Porsche	0	220	21900.00%	0.00%	0.01%
Total	2,629,839	2,686,429	2.15%		

ACG

*Figures from March - December 2012

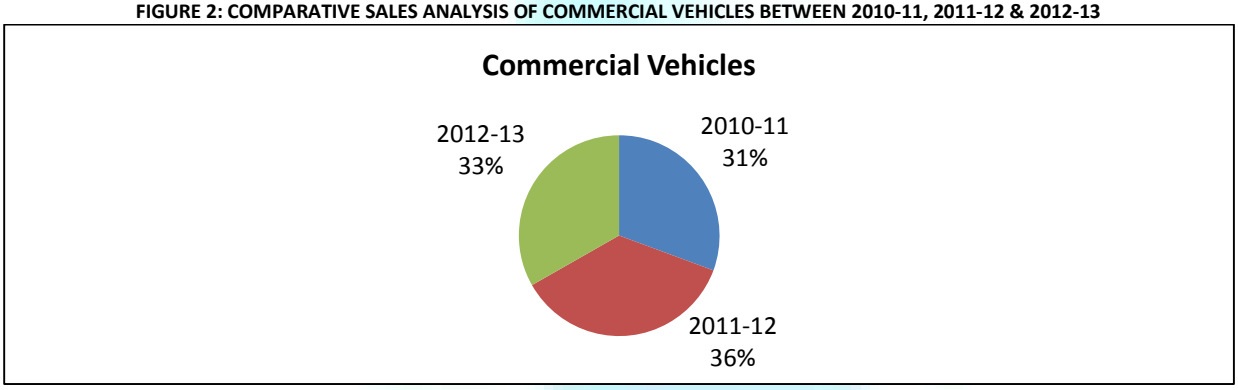
As per the Table 3, Most of the companies are facing the problem of sales slowdown in latest financial year. Out of 21 companies mentioned above, more than 12 companies registered downfall in the year 2012-2013.

FIGURE 1: COMPARATIVE SALES ANALYSIS OF PASSENGER VEHICLES BETWEEN 2010-11, 2011-12 & 2012-13



According to the Figure 1, the sales of Passenger Vehicles came down by 3%in the financial year 2012-13.

FIGURE 2: COMPARATIVE SALES ANALYSIS OF COMMERCIAL VEHICLES BETWEEN 2010-11, 2011-12 & 2012-13



As per Figure 2, commercial vehicles' sales are also declined by around 3%in the financial year 2012-13.

FIGURE 3: COMPARATIVE SALES ANALYSIS OF THREE WHEELERS BETWEEN 2010-11, 2011-12 & 2012-13

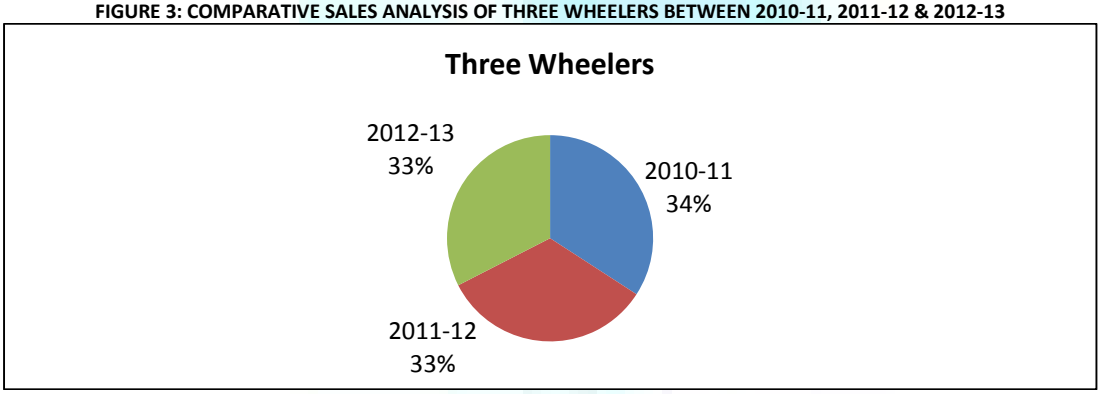


FIGURE 4: COMPARATIVE SALES ANALYSIS OF TWO WHEELERS BETWEEN 2010-11, 2011-12 & 2012-13

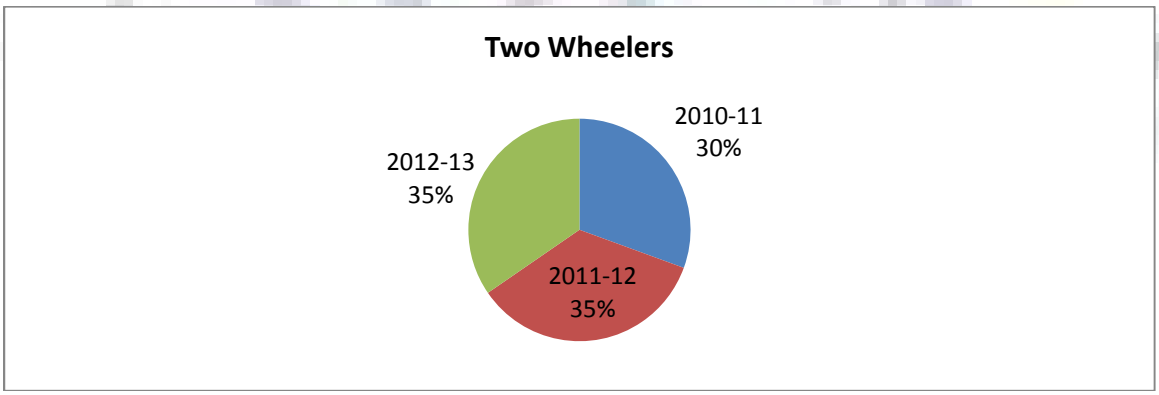


Figure 3 & 4 shows that the three wheelers and two wheelers segments are also not at the growth path.

REASONS OF DOWNFALL IN INDIAN AUTOMOBILE INDUSTRY

VEHICLE DEMAND

As we have seen through above analysis, the Indian automobile industry is facing slowdown in sales. Market Shares of India's top automobile companies have fallen 10% to 16% over the past few months tracking weak vehicle demand, and analysts expect the trend to continue for some more time.

HIGH FUEL PRICES

India's automobile market, which has appealed venture from worldwide companies seeing for growth in developing markets, has vanished some of its shine as high fuel prices and increasing interest rates as well as worries of job losses in a slowing economy have kept customers away. The weak economy has also injured demand for commercial vehicles. In modern times, the prices of fuel have been rising suddenly, making it challenging for a lot of buyers to sustain the use of an automobile vehicle. It is unidentified fact that a high proportion of the Indian buyers belong to the lower and middle class income groups. These customers are continuously on the searching for substitutes for fuels, which has resulted in the rise for CNG and LPG vehicles.

MOTOR FINANCE

Since most Indians buy vehicles with loaned out money, high interest rates have been a major factor hurting sales. The Reserve Bank of India increased interest rates 13 times. On the basis of a report given by ACG, 2013, passenger Car sector dropped by 11.33%, while van segment decades by 10.88%. The Indian passenger vehicle industry, which is in front of the toughest times, saw three consecutive month of sequential decline in April to June of this financial year. While a minority of companies tried to attract customers to their outlets by proposing discounts to lift their sales in the last month of FY 2013, low economic sentiment, high interest rate, late purchases and fluctuating fuel prices had their impact on total market demand. Fuel hikes, poor buyer sentiment hit June 2013 sales.

USED CAR SALES

The trend, it seems, is not a blip or limited to a particular market. The economic slowdown and the steep fall in the value of the Indian rupee have erased the dividing line between those who scouted for a new car and those willing to settle for a well maintained used car. The depreciation of the rupee, among others, has also meant an increase in input costs, leading to prices of cars being raised even as demand was falling. As a result, for the first time in the history of the Indian automobile market, the used car segment has witnessed a 22-25 per cent rise in sales during April-July 2013 as against a 9.7 per cent decline in new car sales in the same period, industry experts said.

SWOT ANALYSIS OF INDIAN AUTOMOBILE INDUSTRY

STRENGTHS

- Investments by global manufacturers
- Indian market is very large
- Low labour cost
- Government assistance in production
- Increasing demand for international quality
- Rise in the working and middle class income

WEAKNESS

- Government taxes increase the cost of manufacturing
- Lack of Research & Development
- Lack of appropriate manufacturing units
- Production costs are generally higher than some other countries like China etc.
- High interest rates
- Labour Productivity is low
- Local demand is still towards low cost vehicles, due to low income levels

OPPORTUNITIES

- Rising rural markets
- Increase in Population
- Reduced excise duty
- Growth in living standard
- Constant increase in salaries/incomes
- Auto vehicle (car etc.) as status symbol
- Demand of better and latest technology

THREATS

- High rate of interest
- Lack of technological setup for Indian companies
- Tough competition with Chinese manufacturers
- Costly raw material
- Less skilled labour
- Congestion on the urban roads

ACTION PLAN FOR THE FUTURE GROWTH

As we have already discussed that automobile industry is facing the problem of slowdown. Companies should try to increase their market with various ways. Companies have to be prepared with new dealers and models to drive growth of automobile market. Companies will have to focus on the core values, as Technology, Quality, Performance and Uniqueness.

It is not surprising that the high growth rates witnessed in the Indian automobile industry for the past few years have coincided with similar high GDP growth rates recorded by the country along with growth in incomes. The increasing purchasing power of rural India, accelerated development of roads and highways are factors that will help fuel further demand for mobility and vehicles. Though personal taste and lifestyles of customers are changing, companies should develop new designs for the vehicles which may fulfill the demand of current consumers. As per the analysis done by Industry experts, electric vehicles may be the alternative for Indian buyers of automobile vehicles. These vehicles are more environment friendly than normal vehicles. Currently, Mahindra & Mahindra has launched the only electric vehicle (Reva car) in the country. Apart from the Reva, Toyota Prius is a hybrid vehicle which has been seen in the Indian market. Given all the drawbacks, industry experts still feel that electric cars will gain prominence in the Indian car market in coming years. In the 2013 Union Budget, the Indian government claimed that it will provide funds to support production of hybrid and electric models. OEMs should concentrate on filling the gaps in their respective portfolios as well as designing and developing value-for-money products. Companies should have the top preference for R&D activities to think of ways to achieve higher fuel efficiency. There should be nonstop development of current and new resources and procedures in order to produce the components that are price effective and biodegradable. Today, it is the prime responsibility of the top management of every automobile company to share their knowledge and expertise to take initiative for new phase of vehicles. There should be new innovation in Indian automobile industry to solve the problem of slowdown.

CONCLUSION

It can be concluded from the above study that the demand for vehicles is also reliant upon various elements such as convenience and cost of finance, vehicle density, demographic shape of the marketplace and the earning capability. Thus, there is a huge potential market for automobiles that is yet to be tapped through the developments with the use of new technology. Obviously, slowdown is the opportunity for the marketers for new developments. They have the scope for new innovations by conducting research. Automobile companies will have to produce such types of vehicles which may give the motivation to the customers for purchasing of the automobiles. So companies should take the slowdown period as an innovation era. It may lead to satisfaction of the customers and increase in the sales.

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A PROPOSED THEORY OF NEURAL NETWORKS IN KNOWLEDGE MANAGEMENT FOR AN EXPERT SYSTEM

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ABSTRACT

The paper stresses on the concept of Neural Network in Knowledge Management. It gives a detailed insight on Neural Network and also on Knowledge Management . A review on the application of Neural network in Knowledge Management, in several areas has been discussed. The paper also consists of Proposed theory of using Neural Network in Knowledge Management for an Expert System. The proposed method will be highly advantageous in a decentralized computer –assisted patent system which can be used via the internet system. A Proposed Theory of using Neural Networks in Knowledge Management when applied over Expert system , results in effective search patterns, enhanced accurate results and time reduction towards processing. It also includes an application of the proposed theory of applying Neural Network in Knowledge Management for the Operating Research, mathematical problems solving (Expert System) where the solution results in the reduction of redundancy. Thus the proposed theory of using Neural Networks in Knowledge Management for an Expert system, gives a new dimension and encourages over several areas of application such as Graphs, Algebraic calculations , Intelligent system, Decision Support System.

KEYWORDS
neural networks, knowledge management.

PROPOSED THEORY OF APPLYING NEURAL NETWORK IN KNOWLEDGE MANAGEMENT FOR AN EXPERT SYSTEM

Use of the proposed theory of using Neural Networks in Knowledge Management for an Expert system, characterized in that, for patent matters, it is used as an expert system for substantial decisions, for administration or for analyses, with the interaction pair being formed between solutions and tasks or means and effects in the technical field, or in that it is used in the macro-economy as an expert system for financial decisions, for administration or for analyses, with the interaction pair being formed between individual economies which can be separated financially and activity fields, or in that it is used in marketing as an expert system for marketing decisions, for administration or for analyses, with the interaction pair being formed between products and customer requirements, or in that it is used in gene technology as an expert system for DNA sequencing, for administration or for analyses, with the interaction pair being formed between gene sequences and bio-functions, or in that it is formed in the innovation requirement for protective rights application by innovative developments at protective rights receiving points.

The invention relates to a method and a neural network for computer-aided knowledge management, based on a neural network formed by a computer, in particular for use for decentralized computer-aided patent matters, which can be operated via the Internet, in the wider sense.

The neural network forms an artificial intelligence (AI) system since it extends over a fundamental knowledge base in the form of computer-legible data. The neural network is itself advantageously in the form of a specific type of vertically structured neural network similar to the harmony theory, in which each node or neuron, as an element in the network, has an associated significance. Each element is governed by a number of weighted conditions (references) to various hierarchically higher elements.

A further aspect of this invention is the support all users for patent matters and substantial documentation for the focusing, processing and priority-based protective-right storage of their development as an innovation.

Expanded analysis options are advantageous for service providers, and separate neural networks are advantageous for relatively large companies, with these neural networks being connected to the central neural network via a communication link, and optionally being half-mirrored.

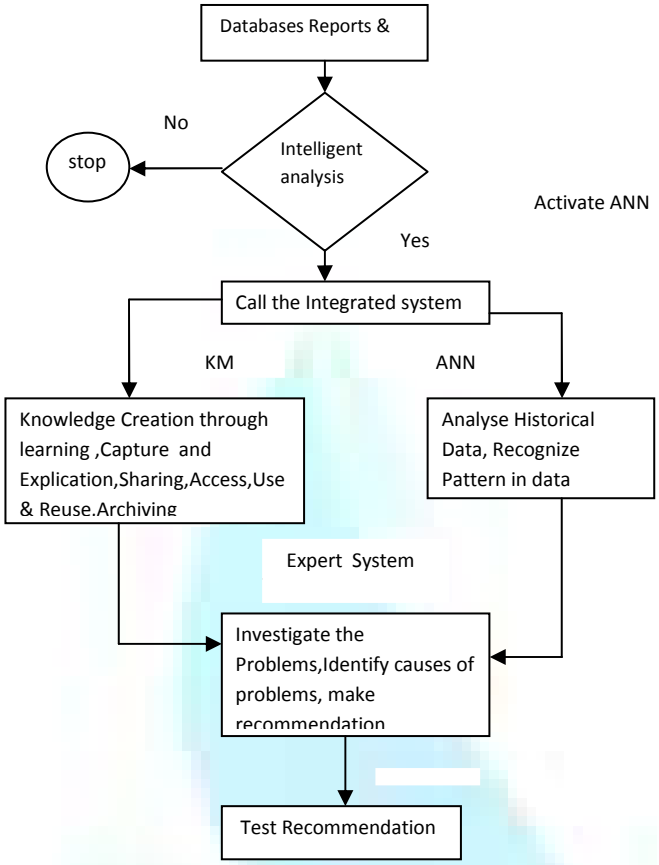
In addition to examination authorization, superior structures advantageously have specific systems which are matched to the respective specific knowledge field to describe the real world, for example for patent matters, macro-economy, marketing and gene technology. In the advanced specific application of gene analysis, gene sequences are read together with the associated identified bio-functions, individual economies and associated activity fields are read for macro-economy, and products and associated customer requirements are read for market analysis.

A processing system for a knowledge base in an expert system, in which the knowledge entered by a user is stored related to the level of the original relationship, and the expert system resulting from this is modified, and is thus maintained, with computer assistance by a knowledge engineer via a knowledge base processing system.

The identified knowledge set (referred for short as the knowledge set in the following text) that describes the real world is for these purposes governed by developments which hierarchically originate from one another in terms of sets. The knowledge management in this invention relates to such knowledge sets.

Briefly, the present invention relates to a method and a neural network for knowledge management, and is based on a neural network that is formed by a computer in its memory location. The inventive method and neural network are especially for use in a decentralized, computer-assisted patent system that can be used via the Internet system, in the broad sense. The neural network forms a system of artificial intelligence, covering a fundamental knowledge base in the form of computer-readable texts.

FIGURE 1: RELATIONSHIP BETWEEN KM, ANN & EXPERT SYSTEM



The Figure 1 shows the Relationship between Knowledge Management (KM), Artificial Neural network (ANN) and Expert System . it is possible to achieve a best solution First Collect the information from Database. With the information check whether a a intelligence analysis required ,if need process further . Call the integrated System (KM,ANN) activate KM and ANN the analysis done by integrated system is implemented with expert system . Finally Test recommended made in KM or any other AI.

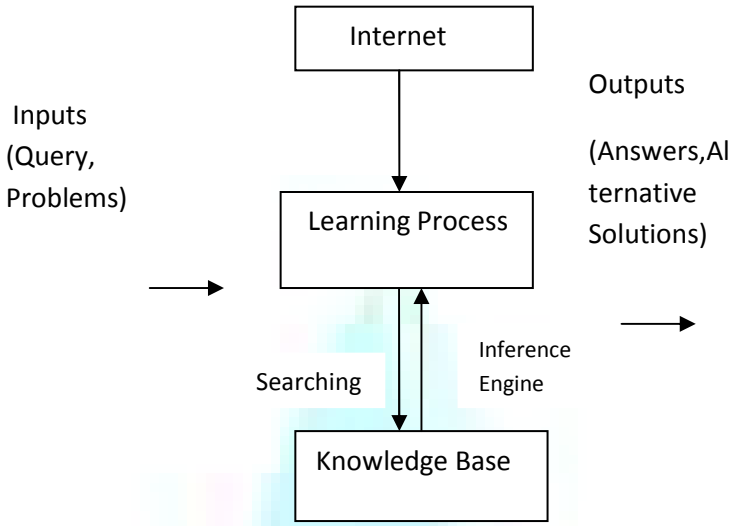
NEURAL NETWORKS IN KNOWLEDGE MANAGEMENT FOR AN EXPERT SYSTEM THROUGH INTERNET

The neural networks in knowledge management , characterized in that the neural network is a component of a server, in that it is connected to a user via a dialog system, optionally via the internet and optionally with the inclusion of a secure e-commerce system, in that inputs for the neural network are optionally entered via a chronological stream, in that separate decentralized neural networks are optionally connected to the central neural network via a communication link and are optionally half-mirrored, and in that the dialog system optionally has an intuitive interface which, as an input for the neural network, allows a definition of the interaction pair, from a selection of references selected via switches, and optionally allows a short title and a short description and, as an output, allows the graphical display of a local environment of directly connected and/or unconnected elements in the associative data structure, and has further tools.

The user inputs and outputs to and from the neural network Figure 2 make use of an intuitive dialog system, to which the neural network contained in a server is connected via communication links for data, particularly advantageously including the Internet.

The neural network is itself advantageously generated exclusively by inputting a standardized, strictly chronological stream, in that the interaction pair <quantity | quality> which is used for definition is directly suitable, or is stored indirectly via pointers, for each element, which is advantageously identified by an associated unique time index the stated references to other elements are stored and generated, and are advantageously cross-referenced via pointers backward in time, or else optionally additionally forward in time.

FIGURE 2: INTERNET USAGE OF NEURAL NETWORKS IN KNOWLEDGE MANAGEMENT



This neural network in knowledge management is contained, in particular, in a central server, which is available at no cost via the Internet to the majority of users or, optionally, is available, subject to a cost with the inclusion of a secure e-commerce system for information and financial services, and which takes care of corresponding actual entries or requests for knowledge.

BOOLEAN OPERATORS OF NEURAL NETWORKS IN KNOWLEDGE MANAGEMENT FOR AN EXPERT SYSTEM

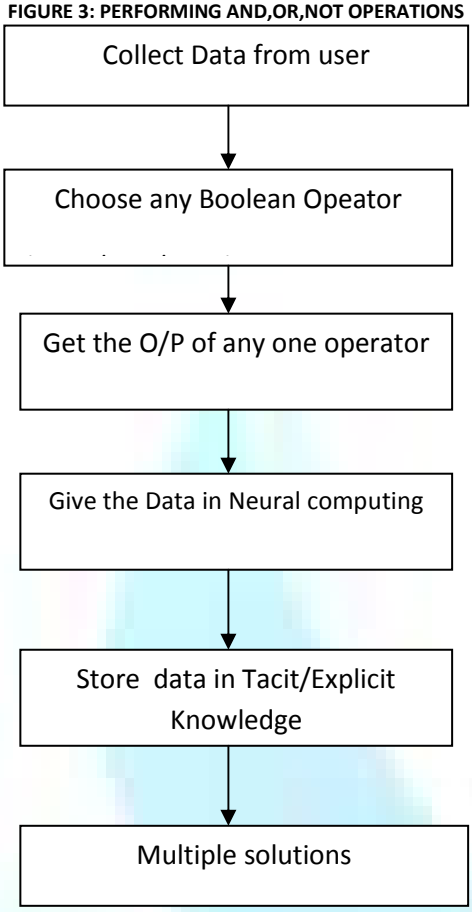
The method for a neural networks for computer-aided knowledge management as , characterized in that all the elements are stored dynamically, and are administered dynamically via a list concatenated via pointers, in that each element has a uniquely associated NOT element, which optionally has a pointer to the same interaction pair and is optionally generated with the generation of the element, with the NOT element optionally differing from the associated element in the LSB of the time index, in that the generation of the references themselves is optionally carried out via interval interleaving to determine that memory area of the reference element which is associated with the time index in the specific associative data structure, and in that this is optionally concatenated at one end or alternately via pointers, which are optionally administered via dynamic reference lists, in that the references are themselves optionally provided with dynamically stored, optionally user-specific weightings, which are optionally formed via the LSB of the unique user index and which are optionally administered via dynamically concatenated weighting lists, in that the operators for calculating the metrics, norm and scalar product in Hilbert space from the neural network are applied to recursively determined coordinates and/or to coordinate vectors of the elements, and the analyses are optionally based on vector calculation methods, and in that a classification system is optionally generated by the neural network from the most significant references of the associative data structure and from the associated elements.

The development systems originate hierarchically from one another via oriented references from a root system by means of set operations (OR, AND, NOT), with the development system which identifies the development being defined via the subset of all the subsets <quantity | quality> of the reference systems, and the generic type being determined via a set relationship which contains this, for example via the subset of all the combination sets of quantity and quality or the subset of in each case one of these sets of all the reference systems.

The developments and the references or the reference developments are defined using a subset relationship Figure 8.3 in the form of an interaction pair in the form <quantity | quality> with respect to the significance content, with this being done verbally using terms which are optionally linked via AND, OR, NOT operators.

The development and/or the element are/is advantageously provided with a short title Figure 8.3. It is also advantageous to improve the legibility for the user for a brief description of the specifically intended development, contained in the knowledge set, to be added. It is likewise advantageous to define the terminology for new defining quantities or qualities on the basis of the quantities or qualities already known from stated references, for which purpose logical operators AND, OR, NOT can be used.

FIGURE 3: PERFORMING AND,OR,NOT OPERATIONS



The elements are advantageously stored dynamically, and are administered dynamically via a list that is concatenated via pointers. Each element has a uniquely associated NOT element, which is advantageously administered by a pointer to the same interaction pair.

The neural network in knowledge management is characterized in that an operator is implemented for calculating a scalar product between each of the two elements, and is optionally in the form of the Euclidean for the n-dimensional space, in that an associated NOT element with a negative weighting for the element can be generated by the neural network for each element, which NOT element accurately denotes the knowledge set excluded from the knowledge set of the associated element, and is optionally generated as a pair with the element, in that a new entry of an element is implemented in the neural network as an addition, and a weighting of a reference is implemented as a multiplication in Hilbert space, and in that a mass can be calculated for each element by the neural network, and is optionally stored with i

CONCLUSION

The proposed theory of using Neural Networks in Knowledge Management for an Expert system, is the application of Neural Network in a knowledge-base that is formed by a computer in its memory location. The proposed method will be highly advantageous in a decentralized, computer-assisted patent system which can be used via the Internet system.

A Proposed Theory of using Neural Networks in Knowledge Management when applied over Expert system , results in effective search patterns, enhanced accurate results and time reduction towards processing.

In real-time application of A proposed theory of using Neural Networks in Knowledge Management for an Expert system in the operating Research, mathematical problem solver(Expert system), where the solution results in reduction of redundancy.

Thus the proposed theory of using Neural Networks in Knowledge Management for an Expert system, gives a new dimension and encourages over several areas of application such as Graphs, Algebraic calculations , Intelligent system, Decision Support System.

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THE INFORMATION MANAGEMENT PRACTICES OF BHIRDAR UNIVERSITY

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ABSTRACT

The purpose of this study was examining the current status of the information management practices at Bahir Dar University, with particular focus on the academic units and core processes of the main campus. Specifically, the study tried to look in to the practices of the student information management system; the library, and other administrative core processes' (human resource core process; purchasing and property administration core process; and the plan, budget, and finance core process) information management systems. A qualitative research design involving unstructured interviews and focus group discussion was employed in the study. The participants were the academic leaders (deans/directors, program managers, and graduate program coordinators of the five academic units (college of science, faculty of humanities, faculty of social sciences, faculty of education and behavioral sciences, and sport academy) in the main campus; the library director; the human resource core process owner; the purchasing and property administration core process owner; the plan, budget, and finance core process owner; and the system administrators. The qualitative information collected from these groups of participants was analyzed using thematic analysis. It was then found out from the analysis and discussion of results that the information management systems of Bahirdar University is not so strong in that that there did not seem to exist a well organized system for smooth information flow and follow up. Encouraging attempts were made with regard to the practices of student information management system; however, this encouraging practice was not extended to the library and other administrative core processes(including the human resource core process; the plan, budget and finance core process; and the purchasing and property administration core processes). Even the existing student information management system had not been implemented in managing the information of distance, summer, extension, and graduate program students. The institutional arrangements for the student information management system also had not been organized in a way to fully function with the necessary human resources and other desired or required inputs. In this regard, the system administrators were strongly complaining that the university should receive and fully own the system through official inauguration so that they could get free time to design other new systems. The centralized nature of the system, the limited roles of the academic units for correcting technical problems, the lengthy bureaucracy required for correcting technical errors, poor culture of the academic staff in respecting deadlines stipulated in the system, lack of adequate computer skills on the part of teachers or academic advisors and customer relation officers, and the time shortage of the system administrators for responding to the concerns of the academic units were the major challenges encountered in the implementation of the existing student information management system. There was also a challenge with regard to this system that the instructors were required to submit grades on the campus network, and the net work interruptions in the university were forcing instructors to spend two to three days for submitting grades. Hence, it seemed sound to reflect here that the university shall revisit its operations with the existing student information management system. The University shall also take the necessary commitment and initiatives in automating the information management systems of the library; the human resource core process; the plan, budget and finance core process; and the purchasing and property administration core processes just like what it did for automating its student information management system. In this regard, the respective core process owners shall further take the leading role in automating their systems. The already existing information management system shall also immediately be applied to managing the information of distance, summer, extension, and graduate program students(the office the academic affairs executive director should take the lion's share in this regard)so that the university would be able to have a better, comprehensive, and responsive student information management system.

KEYWORDS
Information, Management, System, University, Leadership.

1. INTRODUCTION

Today, which we call information age as many technologic developments have been experienced; the biggest task that an organization should shoulder is to stay sensitive to change. Many significant factors such as continuous developments in information technologies, information exchange, increasing expectations of the society, modern managing perceptions and applications cause organizations all over the world to develop new information management systems in order to survive (Demir, 2003). Accordingly, contributions of information technologies to educational institutions have recently been among the mostly emphasized affairs (Webber, 2003; Flanagan&Jacopsen, 2003; Selwood, 2000, Pelgrum, 2001; Yuen, Law &Wong, 2003).

Information systems support not only information process but also innovations to educational institutions (Haag, Cummings & Dawkings, 1998; Bellum, 2003). As being adaptable to changes, these systems are helpful to cope with the demands for change. Therefore, the management of information systems improve the adaptation of the educational institutions to the environment; they enable the institutions to comprehend and define inner and outer information transfer; and thereby, institutional leaders both meet the demands and expectations of its inner (teacher, student) and outer members; and ensures that institutional activities are arranged accurately and on time (Pegler, 1992).

Educational leaders have started to make use of information systems in the gradually-increasing daily management staffs (May, 2003). The reasons for using information systems can also be stated as increasing effectiveness at work by processing information, increasing leadership effectiveness by meeting the need for information and gaining superiority in competitions by directing strategies (Yuen, Law&Wong, 2003). Information management systems in this case aim to provide support for the administrative and educational activities of the educational leaders by processing information. Telem (1999) defines educational institutions management information systems as a management information system designed to match the structure, management task, instructional processes and special needs of the educational institutions. As for a broad definition, contributions of the information systems to educational institutions can be defined as making programs more effective, making the teaching process and the changes in learning environment professional, enabling teachers to exchange their experiences in a more systematic way, working in teams, determining the needs of the students (Gurr, 2000; Pegler, 1992), supporting the educational leaders and other staff in doing their duties, developing their performances, effectiveness and efficiencies (Telem&Buvitski, 1995). In other words, information management systems increase institutions' effectiveness and efficiency by saving time and facilitating development of alternative solutions for sophisticated problems (Vissher&Wild, 1997; Pegler, 1992).

Educational leaders can make more efficient decisions when they get correct and up-to-date information by institutional information management systems (Christopher, 2003). Decision making is the heart of educational management. Daily, problematic conditions that require decision making are based on the complicated and unexpected nature of educational institutions environment. For this reason, as a problem solver, the educational leader has to gather and analyze information continuously (Perez&Uline, 2003). In addition, leaders have been required to make more decisions in short times because of the increasing expectations from the educational system (Christopher, 2003). Moreover, decision making has been faster, more frequent and more complicated in educational institutions of today. In order to make decisions under these conditions, gathering data that is continuous, up-to-date and that can be accessed on time and analyzing and using this data is an obligation (Telem, 1991; Gentry, 2005). Success of educational institutions development studies are mostly based on data based decision making. However, educational leaders are not able to use the data efficiently in this aspect (Gentry, 2005).

Information management systems provide information and various reports from the database in order to make decisions in line with the aims of the institution and facilitate controlling of the activities to achieve the aims (Telem&Buvitski, 1995; Telem, 1991; Christopher, 2003). Information technology helps the leader to

access, manage and report the information quickly and easily (Perez&Uline, 2003). As scholars found out, information management systems have changed the roles of educational leaders (Pegler, 1992) and have changed their methods of working (Christopher, 2003). One of these is to develop a database that includes information on student registration and family, discontinuity, grades, staff and classes, and course information. These are just a step of educational institutions information systems. Other parts of information systems are management of library, finance, fixtures, human resources, schedule planning, standard reports sent to higher levels of administration, etc. These are simple data processing activities that increase efficiency of educational institutions' leadership practices (Pegler, 1992). Moreover, use and analysis of information at educational institutions will not only make leaders realize what should be done in order to develop student performances, but also will ensure success in accomplishing these changes. When leaders use data, they will start to realize innovation efforts on this issue (Christopher, 2003). As a result, it can be stated that by means of information systems educational leaders will be able to determine required information, access the information, interpret the data, use the data in decision making and evaluating, and developing efficient use of the system.

When Gurr (2000) examined effects of information management systems on working of educational leaders in Australia, leaders stated that use of information management systems has introduced them information technologies and the facilities, lessened their workload and made leadership process more efficient, helped them use time more efficiently, made teachers feel themselves more important, made them and the teachers wish to improve themselves more, made important changes in education and teaching, and increased the quality of institutional communication. In their study with higher educational institution managers, Telem and Buvitski (1995) found that institutional leaders believed that institutional management information systems lead to important changes at institutions. According to educational institutions' leaders, this application has increased institutional standards, helped decisions on the level of control and strategy, increased the quality of teaching programs, facilitated student-teacher interaction, increased the coordination between teachers, facilitated systematic and continuous information transfer to parents, and increased communication with other institutions and the central organization. In his study where Gurr (2000) examined effects of information systems on school leaders of local schools, he determined that information systems have largely changed roles of educational leaders; and leaders stated that a leader who does not use the information systems is not able to achieve his duties sufficiently anymore.

However, in literature, there are researches that show that educational leaders had problems in using information management systems for their respective institutions. For example, Visscher and Bloemen (1999) in their study with leaders and teachers working in higher educational institutions in Holland found out that educational management information systems were mostly used in routine works, and leaders and teachers did not have sufficient education on the system. Leaders and teachers indicated that while educational management information systems had positive effects on evaluation of efficiency of the institutions, development of using sources, quality of educational programming and communication, it increased their workload and caused stress. The research indicated that this stress is reduced in institutions where education is sufficiently given on the system and where innovation is clearly stated as a vision. In addition, it was found out that the staff that used the system had higher motivation, was keen to take more education, and adopted the vision of the institution more. In the research where Warren (1998) examined the effects of information systems on educational decision making, he found out that educational leaders have not taken sufficient education on efficient use of the information technologies. Crouse (1994), in this regard, found that education increased the possibility to use the information systems. Also Jacops (1992) claimed that there was a correlation between the amount of education the leaders took, and the use of information technologies.

The purpose of this study, therefore, was to examine the practices of the information management systems at BahirDar University, which is one of the oldest and reputable Universities in Ethiopia. The study was made to focus on Bahir Dar University for the fact that it is the university where student information management system has been introduced since 2009. Though no studies were conducted and even no performance reports were organized on the performances of the system, it had already been in place for about four years. Thus, the study was specifically aimed at describing the current practices and challenges of the student information management system introduced; and examining the practices of information management system in the library and other administrative core processes (human resource core process; plan, budget and finance core process; purchasing and property administration core process) in the main campus.

2. METHODOLOGY OF THE STUDY

As it is already indicated in the introduction section, the major objective of this manuscript was to undertake a qualitative study on the status of information management practices at Bahir Dar University. The study employed a qualitative design, which in fact helped for the in depth description of the application of the system to the academic and administrative units in the university, specifically in the main campus.

The participants were selected from five academic units (colleges/ faculties/academies) at the main campus of Bahir Dar University: College of Science, Faculty of Humanities, Faculty of Social Sciences, Faculty of Education and Behavioral Sciences, and Sport Academy. The participants of the study selected from the above academic units were Deans, Program Managers, and Graduate Program Coordinators. Besides, another group of participants from the administrative wing was included in the study. These participants, selected from the administrative wing, were the plan, budget, and finance core process owner; the human resource core process owner; the purchasing and property administration core process owner; the library director; and the system administrators.

In collecting the desired data for the study, focus group discussion and interview were used and it was found to be interesting as was possible to understand from the participants' reflections during the discussion. The focus group discussion helped the researcher to study the real practices and challenges in utilizing information management system. The interview, on its part, also helped the researcher to collect detailed information from those participants who had active roles in the implementation of the information management system.

Finally, the collected data was analyzed using thematic analysis. This type of analysis is highly inductive in that the themes emerge from the data and are not imposed upon it by the researcher. In most cases, the data collection and analysis seemed to take place simultaneously. Even the background reading formed part of the analysis process for it helped the researcher to explain the emerging themes.

Coding technique was also used to analyze the responses to interview items. In analyzing these data, responses to the interview items were grouped by themes, following the guidelines presented by Creswell and Maietta (2002). In the initial coding, the first step of the coding process, the responses to the interview items were compiled and read in order to determine any dominant themes or patterns in the responses. These responses were used as initial codes for the data. The second phase of the coding process involved arranging the responses into categories that emerged from additional reviews of the data after grouping them for the first time (i.e., categorized according to their affinities into general thematic categories). This yielded a final list of codes for the data. Finally, the coded data were grouped by the emerging themes on the basis of which the thematic content analysis was made. In order to assure trustworthiness of the coding process, a an assistant professor of teaching English as a foreign language took part. The inter-rater reliability was found to be 0.79 in the pilot test, and the inter-rater reliability of the main study was found to be 0.86.

3. RESULTS AND DISCUSSIONS

As was indicated in the introduction and methodology section, this study was conducted on the information management experiences of Bahir Dar University with particular focus on the main campus. The participants were deans/directors, program managers and graduate program coordinators of the respective academic units; and the human resource core process owner, the plan, budget, and finance core process owner, the purchasing and property administration core process owner; the library director; and the system administrators.

The data was collected using unstructured interview and focus group discussion. Accordingly, the collected qualitative data was analyzed using thematic analysis as per the major themes emanated from the field note. Hence, this section is devoted to the presentation of results and discussions. The results and discussions are organized into categories or themes: the student information management experiences; and the library and other administrative units' information management practices of the university.

3.1 THE STUDENT INFORMATION MANAGEMENT PRACTICES

The student information management system has been introduced at Bahir Dar University since 2009 Here, I would like to acknowledge the two system administrators for designing and introducing the system and even for their unreserved commitment in supporting and guiding the implementation or the

functioning of the system. The system was introduced with the assumption that any information related to students is managed effectively and efficiently (System Administer "A").

The system records and avails all the information related to students' biography including family background and address, students full academic records, records related to students academic status, and students dormitory placements(System Administer" B"). This participant went on stating that "the students' registration and graduation are also assumed to be processed through the system". More importantly, "the system gives different roles to the students, course instructors, program managers, deans, the academic affairs executive director, the academic affairs vice president, and to the president as per their respective responsibilities" (System Administrator "B"). Hence, these different organs, as per their corresponding roles, have access to information related to the students placed in the system. "However, the type and amount of information, and the authority granted in the system for the different organs do significantly differ. For example, while the academic executive director has a role to approve the graduation of students, the dean does not have such a provision" (System Administrator "A").

The missing elements in this case are the course chairs and the program representatives. According to the perspectives of "program manager A", these two positions have not been given roles despite the fact that they have important stakes in managing and leading the teaching- learning process and there by monitoring students' progress. Similarly, "program manager B" noted that program representatives (sometimes called as department heads or chair of chairs) and course chairs are the closest stake holders in monitoring students' progress and achievements. Another program manager specifically noted the following reflections:

The university has frequently been communicating that decentralization is getting practiced in the sense that decision making has been devolved to the lower levels. The university has also proudly been talking that the lower level managers are highly empowered in making decisions. However, the department heads (program representatives), the lower level managers in our case, have not been given the provision either to approve or comment on the students grades. Instead, the program manager, though a bit far from daily monitoring of students, is approving the students' grades. (Program Manager "C").

This situation, therefore, seem to require minor amendments on the system so that the two important organs will have the corresponding roles and authorities in processing and monitoring the students' information via the system. Besides, the granting of this role to these two organs (program representatives, and course chairs) would augment their responsiveness and moral, and thereby, commitment because the more authority and responsibility you give to people the more they become committed and responsive (, Gurr, 2000; Komives et- al, 1998).

According to the perspectives of the system administrator "A":

Students are given passwords, in the system, to help them see all the information related to their academic status. In this way, the system offers opportunities for parents to see the results of their children at a distance using the password given to students. What is unfortunate in this case is the situation of Ethiopian parents in that most of the rural parents do not have the knowledge and skills for manipulating computers, and even when they have the knowledge and skills, most of them do not have the net work access to visit the system. However, despite all these limitations, the system is found to be very important in processing students' information very efficiently and effectively.

According to the information collected from the system administrators and deans of the respective academic units, the system currently is offering services for: course and curriculum management; student admission, registration, and achievement; online grade submission and approval; academic program management; graduation and certification; student dormitory placement and management system; and cost sharing management system. Besides, the system administrators noted that the system is almost ready to offer services in the near future for: student cafeteria management; digital signage (dynamic information display system); evaluation of programs and teachers' performance system. System administrator "B" particularly expressed that "the university shall not be reluctant in starting these three recently finalized systems because they are supposed to contribute significantly in promoting the efficiency and effectiveness of operations".

An attempt was also made to ask the system administrators about the benefits gained from the system that has already been introduced and implemented. Accordingly, they reflected that the system has increased efficiency in terms of time, money and energy, which corresponds with Pegler'(1992) and Perez and Uline(2003) reflection that a well managed information system increases the efficiency and effectiveness of operations. The participants also noted that the system has significantly increased transparency because the system is protected from any form of personal fraud or abuse, which also corresponds with the reflection of Gurr(2000) that information management systems when managed carefully promote organizational transparency and communication . According to system administrators' reflections, the system has contributed a lot in increasing customer satisfaction. The deans, program managers, and graduate program coordinators also added that the system has increased the satisfaction of academic leaders, teachers, students and parents in terms of efficient and effective service delivery. Most importantly, as already indicated before, students results are displayed and can easily be seen by academic leaders and parents. This situation, therefore, has created healthy academic competition among them. The competition, according to the perspectives of the system administrators, also seems to include the teachers, academic leaders, and academic units. That is, as the system is quite transparent, every activity related to student admission, registration, grade submission, and certification are visible to the University officials, and hence, this situation has created again healthy competition among those organs in terms of time efficiency so that the students records are secured on time.

Though the system is offering such paramount benefits, the university according to the perspectives of deans, program managers and graduate program coordinators, has not utilized for summer, extension, distance, and graduate students. According to their perspectives, the system is serving only the regular students in the undergraduate programs. This situation seems to indicate that there is a reluctance on the side of the academic units as well as the university officials. As the system administrators noted, there is no any factor which inhibits the academic units or the university in general not to use the existing student information management system to the summer, extension, distance, and graduate program students. The academic leaders of the respective academic units on their part also expressed that they are registering the names, and curriculums of the students in those programs in to the system. However, they are not sure when they have to start using the system in managing the information of the students enrolled in those programs. That is why the researcher reflected earlier that there seem to exist reluctance on this regard. May be this resembles with the findings of Visscher and Bloemen(1999) and Warren(1998) that leaders fail in promoting the utilization of information management systems when they do not have sufficient education on efficient use of the information technologies or when they have not taken sufficient education on the system. In any case, the designed system is quite important in facilitating the student information management in the university, and hence, the university in general, and the respective academic units in particular need to have the necessary owner ship and commitment in fully utilizing the system for students enrolled in the different modalities and levels. The university shall also play the leading role in promoting the benefits of the system so that other higher institutions of learning in the country can easily adapt the system, and thereby, a well organized student management information system can be established in the country. In this regard, there is a wide spread notion that the more well organized information management system the institutions have, the more they become effective and efficient in their operations, and thereby, the more they increase their productivity (Robins, 2005).

Further attempts were also made to point out the problems encountered in the implementation of the system from the perspectives of the system administrators, and the academic leaders of the respective academic units. Accordingly, the system administrators reflected that they are getting disappointed with many factors related to promotion and institutional arrangements. Regarding promotion, system administrator "A" noted that: *the university has to promote the system to other universities so that we may benefit from selling our expertise. What should be understood in this case is that the University did not pay for our professional expertise while designing the system. Perhaps, the university tried to recognize our commitment and efforts through awarding an academic rank of assistant professorship. Though this effort of the university is so encouraging, it shall go a step further in promoting the system to other universities so that we could benefit from selling our expertise. This could have been done through officially inaugurating the launching of the system so that the other universities may start giving value to the system though a significant number of them is still coming for experience sharing.*

The other challenge with the system administrators was with regard to the institutional arrangements. As system administrators expressed, they started implementing the system by the year2009. As the system is a new one to the university, the expertise were required to work day out and day in for clarifying any confusions and challenges to the system users. The users are teachers, program managers, deans/directors, and customer relation officers. All these users, as

the system administrators noted, need immediate guidance regarding the implementation of the system, which in fact required the system administrators to avail themselves on line day in and day out. What seems unfortunate here is that the system administrators are still working with a similar tension though attempts have been made by the university in assigning additional ICT experts to support the system administrators. In this regard, the system administrators are still complaining that there need to an institutional arrangement and the necessary ICT personnel who can fully own and operate the system at the level of the respective academic units. Hence, there does seem a need for the university to pay attention to the issue, to revisit the institutional arrangements, and thereby, to give the desired responses to the claims of those committed system administrators who have been devoting their precious time and energy for facilitating the student information management systems of the university. In light of this, it seems sound to express that for the information management of an institution to be productive, there is a need for having a well organized, and transparent institutional arrangement equipped with the necessary resources including human and fixtures, and perhaps, there is also a need for having a well established monitoring and evaluation system (Christopher, 2003; Harling, 1989).

Generally, the deans and program managers noted that the following persisting problems were prevalently affecting the smooth functioning of the existing student information management system: the centralized nature of the system; the lengthy bureaucracies required for solving technical problems; the lack of computer skills on the part of the academic staff and customer relation officers; the limited roles offered for the deans and program managers of the respective academic units in the management of the system; the lengthy chains required for correcting technical problems; lack of responsiveness of the system in responding to the needs of students with special cases or problems; and the poor culture of the academic staff in respecting the deadlines stipulated in the system. In some cases, the reluctance of the system administrators in responding to the concerns of the respective academic units was reflected as one of the recently encountering problems as reflected by the Deans. The deans in fact did not blame the system administrators for their reluctance, and they rather reflected as the university should have owned the system. Furthermore, the network interruptions were also among the pressing problems causing the teachers to spend a two to three days time for submitting grades online. Hence, paying attention to these and similar other problems would enable the university to have a sustainable student information management system.

3.2. THE INFORMATION MANAGEMENT PRACTICES IN THE LIBRARY AND OTHER ADMINISTRATIVE UNITS

The information management system, as was already indicated in the introduction section, is assumed to be practiced in the library, and other administrative units like the human resource core process ; the plan, budget and finance core process; and the purchasing and property administration core process. The performances of these core processes are key to the university's success provided that there is coherent and organized institutional arrangements for the networked and smooth information flow. Thus, similar to that of the student information management system, there can and should be a well organized information system for managing the operations of the library and the other administrative units of the university.

The library for example, should be networked so that everybody else where could be able to identify books of his/her interest and get the access to read. If that is the case, students and others interested for reading can save time in searching for books, and the books can safely be monitored and controlled (Christopher, 2003). Unfortunately, according to the perspectives of respondent "D", the university library does not have such a system, and things are traditionally operating in a rule of thumb. As per the responses of the academic leaders (deans program managers, and graduate program coordinators), the students have been highly complaining with the inadequacy of the library services that most of the library workers are ill prepared for providing the desired services, because of this fact that the catalogue system is quite disorganized where they do not easily trace books of their preference. The library director reflected that there is a plan to automate the library system, and he added in this regard that they system is in the process of pilot test, but he was not sure when to start the system. This situation, therefore, seem to require the university to make urgent interventions in a way that can maximize effective and efficient service provision, and thereby, ensure strong customer satisfaction. It was reflected by one of the system administrators that the library information management has already been designed, and he was not sure as to why they system was not in place. Universities of the 21st century are highly required to be responsive to the calls of efficiency and effectiveness in their service delivery (Adams, 1986; Bennis and Townsend, 1995). It seems, therefore, sound to reflect here that the university, as one of the biggest in the country and as it is the one striving to be one of the premier African Research Universities by 2025, should be able to implement a well organized and responsive library information management system so that the service provisions would be by far efficient and effective, and thereby, students productivity and achievements would be promoted. That is, this is one of the strategies as to how a vision for becoming a premier research university could be realized.

The administrative units including the human resource; the plan, budget and finance; and the purchasing, and property administration process owners are also expected to be networked through a strong information management system. The university officials and others concerned need to be able to access information about the plan and implementation reports of these units. The system should be able to offer any information about the resources available in each unit, the daily challenges and achievements, the performance status; and about the issues requiring urgent intervention (Christopher 2003). However, as per the information collected from the process owners of the three administrative units, there is no such a system in the university. The reporting system is very traditional using hard copies. The university officials' decisions are highly dependent on the reports of the core process owners. The officials decisions in this case are likely to be in accurate because the source of information is the individuals, not the system.

In such situations, therefore, performances are not likely to be clearly measured because recording and reporting are also dependent on the core process owners' personalities. Institutions of the 21st century, as was already noted earlier, do not accommodate such traditional practices (Adams 1986) for the fact that they are operating in a globalised environment where there are turbulent changes elsewhere. The author also went on stating that these changes are so demanding that the institutions should be so effective and efficient in order to cope up with the changes. The university, hence, seems quite lagging behind the change because it is still operating using rule of thumb.

Had the information management system been started with plan, budget and finance core process; there would have been clear and transparent information flow for every transaction. For example, the president may know the monthly, quarterly and annual plans and the corresponding performances reports through the system without having direct contact with the core process owner (Christopher 2003). The president, as to Christopher, may also know the budget implementation status so that he/she can take timely measures accordingly; the financial flow can also be actively monitored if such a system is in place. In some cases, it may not be unusual to see differences with the financial practices of the different finance offices in the university. Imagine, the existence of different practices within the same university. The core process owner in this regard reflected that there is a soft ware sent from the Ministry of Finance at national level. As per his reflections, this software can serve as a good information management tool provided that all the finance units of the university are integrated in to the University's server. Perhaps, this may require a smaller intervention of the university's ICT office in integrating the finance units in to one server so that information can easily be accessible to everybody concerned, and thereby, monitoring and follow up would be easy accordingly.

The same may happen to the human resource core process in that the system can avail all the necessary information of the human resource in terms of age, experience, qualification, and current engagement. For example, the university gives further education opportunities for a large number of staff each year, and they are supposed to complete their education within a specified period of time so that the university can benefit in return. As per the perspectives of the deans and program managers, however, many of them disappear, and others extend their education for seemingly unlimited periods for there is no a well organized monitoring and follow up system. In some cases, the human resource core process, as the deans and graduate program coordinators noted, does not have the information as to when some staff members started their further education, and consequently, the core process tries to count the number of years required for such trainees as per their consensus. Another challenge associated to this core process was the lack of accuracy in human resource planning in that there need to be an accurate process for determining the number and kind of human resource required at a right time and place. As per the perspectives of the academic leaders, it is common to see a large number of human resources loaded at a certain unit or department; and on the other hand, it was not also uncommon to see high scarcity of human resources in the other units or departments. Apart from the in accuracy in terms of quantity, there also seem to exist a common practice in our case as the academic leaders reflected that the assignment of the right person at a right place is quite futile in that staff grievances were common here and there about placement and related issues. Moreover, there was also high inconsistency on the appointment and transfer of the human resources, and this could possibly be attributed to the lack of a well organized information management system. Had there been such a system, the president could have easily

seen such appointment and transfer cases so that the inconsistencies couldn't have been continued so far. Surprisingly, it took us about three weeks to get the list of academic staffs working in the university in responding to the requests of the Ministry of Education. The Ministry of Education had been frequently calling to the Academic Affairs Vice President Office, but the human resource core process failed to process the data, which was a clear indication of having a disorganized information system. In this regard, the human resource core process owner reflected that an information management system had been designed to manage the information of the core process. As per his reflections, the necessary data of the human resource had been entered into the newly designed human resource information management system, but he was not also sure when to start utilizing the system.

Worst of all, the purchasing and property administration core process was facing serious challenges for lack of an organized information management system. In this case, it was very common to see many computers, printers, photocopy machines, and other equipments stopped working and loaded in many offices in a disorganized manner. On the other hand, as the academic leaders reflected, it was also common to see the university continuously buying new computers, printers, photocopy machines and other equipments without trying to maintain the existing, and even without trying to undertake accurate property auditing. In some cases, for example, you may see staff members taking two laptop computers while the others do not have even one. In general, the university had been operating in a very traditional way despite the fact that there was a sound opportunity to design and implement a well organized information management system for monitoring the utilization of material resources. The core process owner reflected in this regard as she did not know any plan to automate the information management of the core process despite those pressing challenges. So, the university shall take the necessary initiatives in integrating the information management system of this core process.

What seems confusing, in this case was, the failure of the university in automating the information management system in a situation where there were experts who could easily adapt the system. According to the interviews conducted with the system administrators, they were very much willing to design and strengthen the information management system of the university, just like what they did for the student information management system of the university. So, it clearly seemed to indicate a reluctance or lack of commitment on the part of the university to strengthen its information management system, or maybe there was a lack of the necessary orientation on the merits of an integrated information management system, which perhaps, may require further enquiry.

4. CONCLUSION AND REFLECTIONS

For the fact that globalization is requiring countries in general and institutions in particular to cope up with the turbulent changes in the world environment, and for the fact that coping up with this change requires operating with high efficiency and effectiveness, using a well organized and sustainable information management system seems quiet mandatory for institutions of higher learning. Higher institutions of learning in the 21st century are highly required to operate on competitive basis in response to addressing the expectations of the beneficiaries or students who are also required to be competent for the competitive world of work.

In this regard, the study indicated that the information management system at Bahir Dar University is so loose except with the attempts made to automate the student information management system. It was evident that the student information management system of the university had been quite functional and had also been facilitating task related to student admission, registration, academic record, status determination, graduation and certification, and dormitory placements. However, the existing student information management system had not been implemented in managing the information of distance, summer, extension, and graduate program students. The institutional arrangements also had not been organized in a way to fully function with the necessary human resources and other desired or required inputs. In this regard, the system administrators were strongly complaining that the university should receive and fully own the system so that they could get free time to design other new systems. For example, the University could easily assign ICT experts for the respective academic units so that the student management system could be owned by the academic units . Another solution could also be offering the necessary system management roles to the deans and program mangers so that the lengthy bureaucracies and centralizations observed for managing technical problems could shortly be managed at the level of the academic units. Besides, this system had not been expanded to the other core processes like the plan, budget, and finance core process; the purchasing and property administration core process; the human resource core process; and to the library core process.

Thus, there seemed a strong need for the university to revisit its operations in terms of information management so that it can clearly understand that it is not operating up to the standard. The core processes are operating and reporting as per traditional trust in a sense that it seemed the core process owner who was likely to determine the success or failure of the core process as long as he/she was the one to plan , evaluate and report. That is, the higher officials had limited chance to monitor, and support the operations, and they were rather limited to the reports from the respective core process owners. This situation, however, would take the university nowhere. Higher officials need to have fresh and live information about the daily operations of the respective core processes using a well organized information management system. Otherwise, they will be forced to lead from a distance, and leading from a far distance is just like shooting a gun in a dark. The University shall, therefore, take immediate measures in automating its information management system using the experts who already introduced the student information management system so that we all would be able to see a competent university striving to be one of the premier research universities in Africa by 2025.

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VEBLENIAN SOCIO-PSYCHOLOGICAL MODEL: AN ETHNOGRAPHIC STUDY

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ABSTRACT

India is a country with huge population. There are various groups of people based on castes, sub-castes, religions, tribes etc., with different cultures. Hence, it has become very tough to the producers and marketers to produce and sell the goods and services according to the ever changing requirements of such groups. The 'An ethnographic study of low-income consumer behaviour' is a new term used in the present study where sociology, anthropology and marketing subjects are integrated. Because of so many influencing factors there, the Veblenian socio-cultural factors (like culture, sub-culture, social class, reference group, family and its supporting elements) were taken for the study. Multi-stage stratified disproportionate random sampling technique was employed in the sample selection. We found that most of the low-income consumers were being influenced by social class and family among the above said factors.

KEYWORDS

low-income consumer behavior, Ethnographic study,Marketing, Veblenian factors.

INTRODUCTION

Ethnography is a branch of Anthropology concerned with the description of ethnic group. Ethnic group is a group which shares socio-cultural characteristics in the society. An ethnic group may be defined as a group of individuals "with a shared sense of people-hood" based on presumed socio-cultural experiences and/or similar physical characteristics. Such groups may be viewed by their members and/or outsiders as religious, racial, national, linguistic, and/or geographical (A.V.Athelesten 1979). Thus, what ethnic group members have in common is their ethnicity or sense of people-hood, which represents a part of their collective experience.

ETHNOGRAPHIC METHOD

Ethnographic method starts with the selection of a culture, review of the literature pertaining to the culture, and identification of variables of interest – typically variables perceived as significant by members of the culture. The ethnographer then goes about gaining entrance, which in turn sets the stage for cultural immersion of the ethnographer in the culture. It is not unusual for ethnographers to live in the culture of months or even years. The middle stages of the ethnographic method involve gaining informants, using them to gain yet more informants in a chaining process, and gathering of data in the form of observational transcripts and interview recordings. Data analysis and theory development come at the end, though theories may emerge from cultural immersion and theory articulation by members of the culture. However, the ethnographic researcher strives to avoid theoretical preconceptions and instead to induce theory from the perspectives of the members of the culture and from observation. The researcher may seek validation of induced theories by going back to members of the culture for their reaction. Ethnographic methodologies vary and some ethnographers advocate use of structured observation schedules by which one code may be observed behaviours or cultural artifacts for the purpose of later statistical analysis, for instance of consumer behaviour

VEBLENIAN SOCIO–PSYCHOLOGICAL MODEL (IN BRIEF)

Thorstein Veblen saw man as primarily a social animal conforming to the general forms and norms of his larger culture and to the more specific standards of the sub cultures and face to face group to which his life is bound. His wants and behaviour are largely moulded by his present group memberships and the group memberships to which he aspires. The basic theme is that man's attitudes and behaviour are influenced by several levels of society, culture, sub-culture, social classes, reference groups, face to face groups and family. The challenge to the marketer is to determine which of these social levels is most important in influencing the demand for his product.

STATEMENT OF THE PROBLEM

The research studies conducted, so far, were either related to Sociology or neither Anthropology nor consumer behavior in relation to particular product or services. There were no research studies integrating these exclusive subjects. Hence, the present study has assumed greater importance in the present India. The present study looked at low income consumer behavior of scheduled castes in cultural perspective. The study includes how individuals of scheduled castes make decisions in spending their available meager resources (time, money, efforts) on consumption related items.

OBJECTIVES OF THE STUDY

1. To investigate the motivational factors (Especially V.B factors) influencing the shopping and consumption behavior of low income people from scheduled castes.

RESEARCH METHODOLOGY

The following is the methodology followed in accomplishing the stipulated objectives of the study:

RESEARCH APPROACH

The ethnographic method is applied to the present study of research in marketing. The research approach consists of the following steps to meet the objectives of the present study:

- Establishment of residents in the proposed study area for a period of approximately 9 to 12 Months.
- Selection of approximately 10 families of the resident population for closer observation and study.
- Development of social relationship and friendship with residents of the study area.
- Informal discussions on shopping and consumption behaviour of the residents.

- Investigation of the market place facilities in the study area.
- Interviewing owners, managers of local retail and service shops.
- Interviewing of elites, communities, organization workers, social workers and other community residents and officials in the study area.
- Accompanying local residents during shopping trips.
- Selection of the samples from the selected area.

SAMPLE SELECTION

Both primary and secondary data were used in the present study. Convenience sampling and multi-stage disproportionate stratified random sampling techniques were adopted in sample selection. Accordingly Kadapa district was selected as sample district, based on convenience sampling technique. The Kadapa district is one of the 4 districts in Rayalaseema region of Andhra Pradesh, other divisions being coastal Andhra and Telengana region with 9 and 10 districts respectively. The multi-stage stratified disproportionate sampling procedure comprised the selection of mandals at its first stage, selection of villages in the second stage, and finally the selection of families in the third stage. Accordingly 5 villages at random were selected from each mandal of 51 mandals in Kadapa district, and then 5 familiesfrom each village were selected to elicit responses to the questionnaire administered. Thus the total sample consists of 255 families. Besides this sample, 10 families from Putlam Palli panchayat in Kadapa district of Andhra Pradesh State as well was selected for the purpose of staying with them for 9-12 Months with a view to gain close observation and to attain the stipulated objectives of the present study.

TOOLS FOR DATA ANALYSIS

Both primary and secondary data were collected, classified, calculated, tabulated and analyzed systematically as per the required order by using percentage analysis, chi-square analysis.

EMPIRICAL ANALYSIS OF THE STUDY

In the following table when we aggregate all the respondents as per the reference groups mentioned in the table, majority of the respondents(31.73%) opined that 'family' was their influencing group while 21.3% felt 'friends', 15.6% felt 'co-workers', 11.3% each cited both 'religious groups' and 'trade unions', the remaining 8.69% of total respondents felt 'others ' as their reference group.

TABLE 1: ASSOCIATION BETWEEN INCOME AND REFERENCE GROUPS OF THE RESPONDENTS

Sl. No.	Income	Number of respondents	No. of respondents influenced by					
			Family	Friends	Co-workers	Religious groups	Trade union	Others
1.	*Rs.15000-30000*	*27*	*08*	*03*	*05*	*04*	*02*	*05*
2.	*Rs.30000-45000*	*72*	*27*	*14*	*11*	*06*	*09*	*05*
3.	*Rs.45000-60000*	*89*	*30*	*21*	*14*	*12*	*07*	*05*
4.	*Rs.60000-75000*	*36*	*9*	*12*	*04*	*07*	*01*	*03*
5.	*Rs.75000-90000*	*19*	*04*	*02*	*02*	*02*	*06*	*03*
6.	*Rs.90000-120000*	*12*	*03*	*04*	*02*	*01*	*01*	*01*
	Total	*255 (100%)*	*81* (31.76)	*56* (21.96)	*38* (14.90)	*32* (12.54)	*26* (10.19)	*22* (8.62)

Source: Field data

($\chi 2 = 22.24$ P= 0.327)

- Figures in parentheses indicate percentage to total. (Since the calculated value is greater than the critical value, it is found that there is no association between their income and influencing reference groups while making a purchasing decision, and hence, the hypothesis 4 'there is no association between income level of the respondents and reference group' is accepted).

TABLE 2: DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR OCCUPATION AND INFLUENCING CULTURAL FACTORS WHILE MAKING A PURCHASE DECISION

Sl. No.	Occupation	Number of respondents	No. of respondents influenced by			
			Values	Beliefs	Customs and practices	Others
1.	Govt. employees	12	***03***	***05***	***02***	***02***
2.	Pvt. employees	65	***08***	***18***	***12***	***27***
3.	Agricultural labour	112	***14***	***25***	***17***	***56***
4.	Cultivators	16	***03***	***05***	***05***	***03***
5.	Business men	20	***03***	***08***	***03***	***06***
6.	Others	30	***06***	***04***	***09***	***11***
	Total	255 (100%)	***37*** (14.50)	***65*** (25.49)	***46*** (18.03)	***107*** (41.96)

Source: Field data

($\chi 2 = 15.08$ P = 0.2369)

*Figures in parentheses indicate percentage to total**.**

(There is no association between occupation and their influencing cultural factors while making a purchasing decision, and hence, the hypothesis 11 'there is no association between the occupation of the respondents and cultural factors while making purchase decision' is accepted)

It may be deduced that, most of the respondents i.e., 107 respondents (41.96%) irrespective of their profession gave priority to 'others', 65 respondents (25.49%) to 'beliefs', 46 respondents to (18.03%) 'customs and practices', and lastly 37 respondents to (14.50%) 'values' as their influencing cultural factors.

TABLE 3: DISTRIBUTION OF RESPONDENTS AS PER THEIR AGE AND INFLUENCING SUB-CULTURAL FACTORS WHILE MAKING A PURCHASE DECISION

Sl. No.	Age	Number of respondents	No. of respondents influenced by				
			Religious factors	Racial factors	Geographical factors	National factors	Other factors
1.	***15-25 years***	***33***	***06***	***09***	***02***	***04***	***12***
2.	***25-35 years***	***102***	***31***	***23***	***10***	***03***	***36***
3.	***35-45 years***	***74***	***29***	***15***	***06***	***02***	***22***
4.	***45-55 years***	***32***	***12***	***09***	***04***	***01***	***06***
5.	***55 years and above***	***14***	***04***	***03***	***02***	***02***	***03***
	Total	***255 (100%)***	***82 (32.15)***	***59*** (23.13)	***24*** (9.41)	***12*** (4.70)	***78*** (30.58)

Source: Field data

($\chi 2 = 8.354$ P = 0.498)

Figures in parentheses indicate percentage to total.

(Since the χ^2 value is greater than the table value it found that there is no significant association between the two variables, and hence, the hypothesis 23 'there is no association between age and sub-cultural factors' is accepted)

It is clear from the analysis that the preference was given to 'religion', 78 respondents (30.58%) to 'others', 59 respondents (23.13%) to 'racial factors' 24 respondents (9.41%) to 'geographical factors' and the remaining 12 respondents (4.70%) to 'national' factors.

Table: 4 shows, on the whole, 91 respondents (35.68%) gave priority to 'father', 57 respondents (22.35%) cited 'mother', 48 respondents (18.82%) 'both' (father and mother), 34 respondents (13.33%) 'children', 18 respondents (7.05%) 'all' and the rest 06 respondents (2.35%) referred 'others' (i.e., relatives, strangers, neighbors, etc.,) as their reference groups.

TABLE 4: DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR FAMILY SIZE AND INFLUENCING MEMBERS OF THE FAMILY WHILE MAKING A PURCHASE DECISION

Sl. No.	Family size	Number of respondents	No. of respondents influenced by					
			Father	Mother	Both	Children	Others	All
1.	Two	18	10	06	02	-	-	-
2.	Three	27	09	08	06	03	-	01
3.	Four	46	14	11	09	07	01	03
4.	Five	73	28	18	12	08	-	07
5.	Six	48	19	08	10	07	01	03
6.	Seven	25	06	03	04	06	02	04
7.	Eight	10	03	02	02	02	01	-
8.	Nine and above	08	02	01	03	01	01	-
	Total	255 (100%)	91 (35.68)	57 (22.35)	48 (18.82)	34 (13.33)	06 (2.35)	18 (7.05)

Source: Field data

($\chi 2 = 9.959$ P = 0.8222)

Figures in parentheses indicate percentage to total**.**

(There is no association between family size and their influencing family members during purchase decision, and hence, the hypothesis 24 'there is no association between the family size and influencing family members during the purchase decision' is accepted)

TABLE 5: DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR FAMILY CONSUMPTION EXPENDITURE PER ANNUM AND INFLUENCING SOCIAL CLASS FACTORS WHILE MAKING A PURCHASE DECISION

Sl. No.	Family consumption expenditure (p.a)	Number of respondents	No. of respondents influenced by				
			Income	Occupation	Asset value	Literacy level	Others
1.	Below Rs.20000	15	06	01	03	02	03
2.	Rs.20000-30000	74	22	12	18	06	16
3.	Rs.30000-40000	72	25	13	10	05	19
4.	Rs.40000-50000	50	13	05	15	07	10
5.	Rs.50000-60000	26	05	03	08	04	06
6.	Rs.60000 and above	18	06	03	04	02	03
	Total	255 (100%)	77 (30.19)	37 (14.50)	58 (22.74)	26 (10.19)	57 (22.37)

Source: Field data

($\chi 2 = 11.108$ P = 0.802)

1) Figures in parentheses indicate percentage to total.(There is no association between family expenditure and their influencing social class factors during the purchase decision, and hence, the hypothesis 35 'there is no association between the family's consumption expenditure and social class factors is accepted)

It may be seen that the most of the respondents took sides in favor of 'income' as their influencing factor covering 30.19%, while 58 respondents (22.74%) preferred 'asset value', 57 respondents (22.37%) 'others', 37 respondents (14.50%)'occupation' and only 26 respondents (10.19%) 'literacy level'.

TABLE 6: VEBLENIAN SOCIO-CULTURAL FACTORS AND THEIR ASSOCIATION WHILE MAKING A PURCHASE DECISION

Sl. No	Veblenian factors	Initials	Communalities
1	Reference group	1.000	0.894
2	Culture	1.000	0.906
3.	Sub-culture	1.000	0.936
4.	Family	1.000	0.903
5	Social class	1.000	0.943

Sources: Field data

Extraction method: Principal component analysis.

The five Veblenian socio-cultural factors include 'reference group', 'culture', 'sub-culture', 'family', and 'social class', with high communalities of 0.894, 0.906, 0.936, 0.903, and 0.943 respectively. This indicates that the factors have high degree of association among themselves. It may be concluded that the consumers who were influenced by any of these factors were also influenced more or less by the remaining factors.

TABLE 7: VEBLENIAN SOCIO-CULTURAL FACTORS AND THEIR RELATIVE IMPORTANCE IN THE PURCHASE DECISION

Sl. No	Veblenian factors	Total	% of explained variance	% of Cumulative variance
1.	Income level	5.341	79.296	76.296
2.	Reference group	1.046	14.942	91.238
3.	Culture	0.276	3.943	95.180
4.	Sub-culture	0.122	1.399	98.329
5.	Family	9.795E-02	1.399	98.329
6.	Social class	6.623E-02	0.946	99.276
7.	V.B. factors	5.071E-02	0.724	100.00

Sources: Field data

Extraction method: Principal component analysis.

From the table it is clear that 'income level' has high relative importance of 79.296% variance out of 7 variables of the underlying factors. It is the most influencing factor while making a purchase decision, followed by culture, sub-culture, family, social class and V.B. factors with 14.94%, 3.94%, 1.40%, 1.40%, 0.946% and

FINDINGS AND SUGGESTIONS

1. Association between income and reference groups of the respondents

FINDING

Based on the income, the influencing reference groups of low-income consumers kept on changing. But the overall observation shows that 'family' (31.76%), 'friends' (21.96%) and 'co-workers' (14.9%) were the main influencing factors while making a purchase decision.

REASON

Irrespective of their income level, the low-income consumers of scheduled castes gave priority to the suggestions of the 'family members' and 'others' in making a purchasing decision.

SUGGESTION

There are different levels of income among low-income consumers from scheduled castes. So, the marketers should take into consideration the opinion of 'family', and 'friends' for selling the goods and services.

2. Distribution of respondents according to their occupation and influencing cultural factors while making a purchase decision

FINDING

There was difference in the type of influencing cultural factors of agricultural labourers and private employees when compared to that of cultivators and business people. The agricultural laborers 56, 25, 17, 14 preferred 'others', 'beliefs', 'customs and practices' and 'values' consecutively. while the cultivators 5, 5, 3, 3 preferred 'customs and practices', 'beliefs', 'values' and 'other factors' in that order. With that, it is clear that based on their occupation their influencing factor is also changing.

REASON

Low-income people of agricultural laborers and private employees preferred 'others' like the family, food, dress, and health. So it affected the overall response of the total respondents.

SUGGESTION

People who were good by their profession preferred 'customs and practices', 'beliefs' and 'values'. But those who were low by their profession mostly preferred 'others' like their necessities that were related to their better lively-hood. So, it is suggested the producers and marketers concentrate on the low profession respondents as they influence the remaining people's responses of the scheduled castes category.

3. Distribution of respondents as per their age and influencing sub-cultural factors while making a purchase decision

FINDING

In the distribution of respondents as per their age table, most of the respondents chose 'religious factors' (32.15%), followed by 'other factors'(3.58%), 'racial factors' (23.13%), 'geographical factors' (9.41%), and 'national factors' (4.70%) as the most influencing factors during the purchase decision. In the 25-35 years age group, respondents mostly preferred 'others', 'religious' and 'racial' factors. While the respondents of 45 years age gave priority to 'religious', 'racial' and 'other' factors.

REASON

Since the youth and adults have preference to local and regional changes, and the elders had faith in religious and racial factors, they responded accordingly.

SUGGESTION

Marketers should keep in view the responses of the people especially of the age group of 25-35 years since they influence the remaining age group.

4. Distribution of respondents according to their family size and influencing members of the family while making a purchase decision.

FINDING

It is found, irrespective of the family size, the 'father' (35.68%) in the family were the main influencing factors followed by 'mother' (22.35%) while making a purchase decision. But according to their family size their order of priority in respect of influencing factors while making a decision in the family was changing. However, both wife and husband, and all had the joint decision making to the tune of 7% and 19% respectively.

REASON

Since, families having five and less than five members were large in number in the scheduled castes category, their behaviour affected the responses of the remaining sample.

SUGGESTION

It is suggested the producers and marketers know the standpoints of male (husband) female (wife) and both together in respective of their needs, tastes and preferences.

5. Distribution of respondents according to their family consumption expenditure per annum and influencing social factors

FINDING

Based on 'asset value' their order of priority was changing. But, most of the respondents gave priority to 'income' (30.19%), 'asset value' (22.74%) and 'other' (22.37%) etc., as their main influencing factors while making a purchase decision.

REASON

As scheduled caste's people are economical, they exhaust based on their income and other sources.

SUGGESTION

It is suggested the producers and marketers take into account the opinions of the people whose consumption expenditure is between Rs. 20000-40000 as they are large in number in the scheduled caste's category.

6. Veblenian socio-cultural factors and their association while making a purchase decision

FINDING

It is found that the social class and sub-culture have a very close association among themselves over other factors. However, all the factors had high degree of association among them.

REASON

As most of them belonged to the least income consumers, they did not prefer factors other than 'income' while making a purchase decision.

SUGGESTION

It is suggested the producers and marketers consider the cultural, sub-cultural factors along with the social class of the people while producing and marketing the goods and services.

7. Veblenian socio-cultural factors and their relative importance in their purchase decision

FINDING

It is found that the 'income level' of the low-income consumers influenced their purchase decision. But among the Veblenian Socio-cultural factors; 'social class' and 'sub-culture' were the mostly influencing factors when compared to 'reference groups', 'culture' and 'family'. Hence, it is clear that the consumers who were being influenced by any one of the mentioned factors were also influenced more or less by the remaining factors.

REASON

As most of the scheduled caste consumers were low- income people, factors other than income did not influence them considerably.

SUGGESTION

In order to capture the new markets it is suggested the producers and marketers produce and market the goods and services to them based on their preference for 'income level'.

SCOPE AND LIMITATIONS OF THE STUDY

The present study is successful to the extent of some limitations like it is limited to consumer behavior of scheduled castes in Kadapa district of Andhra Pradesh only. Hence, it may not be generalized for other castes existing in other areas of Andhra Pradesh and other states in India. The present study could cover only on ten families of Putlampalli Harijanawada of Kadapa district for staying with them for 9 to 12 months to observe closely their culture and consumer behavior. The scope of the present study is structured around integrated model, combining the components of Veblenian's socio-psychological model and ethnographic method and is extended to the study of the cultural, social, psychological and economic factors that influence the consumer behavior of selected low-income buyers from scheduled castes in Kadapa district of Andhra Pradesh.

SCOPE FOR FURTHER RESEARCH

The same ethnographic research method can be utilized for conducting the study about the consumer behavior of various income groups from various races, religions, races, and tribes by treating them as distinctive ethnic groups existing in Indian market for various products and services offered by marketers.

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INNOVATIVE TEACHING AND LEARNING TO ENHANCE CRITICAL THINKING AND REFLECTIVE PRACTICE, FOR QUALITY AND RELEVANCE OF HEALTH EDUCATION

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ABSTRACT

Critical thinking and reflective practice is accepted as being a key component of health education and practice. Characteristics of instruction that are assumed to enhance critical thinking are: paying attention to the development of the epistemological beliefs of students; promoting active learning; a problem-based curriculum; stimulating interaction between students; and learning on the basis of real-life situations. The aim of this study is to explore innovative teaching and learning to enhance critical thinking and reflective practice, for quality and relevance health education. A mixed method approach with group samples of undergraduate health education students comprised four studies including surveys and non-participant observations of clinical simulation that were conducted in a university learning environment. The results showed overall that health education students believed that they understood critical thinking and reflective practice and perceive them to be useful for their academic studies and clinical practice. Students were able to describe critical thinking and reflective practice in ideal theoretical terms and were positive towards it regardless of their individual learning styles. Evidence of the nature of critical thinking and reflective practice as it occurred during and after clinical simulation scenarios highlights a need for revised approaches to existing learning-teaching strategies with health education students. The use of clinical simulation for the development of critical thinking and reflective practice in the health education curriculum is supported with recommendations for further studies in academic and clinical settings.

KEYWORDS

critical thinking, health education, quality and relevance, reflective practice, teaching-learning.

1. INTRODUCTION

It is believed that higher educational institutions must prepare students to participate in society as citizen, therefore citizenships in modern society demands other competences than the previous once. Nowadays people are not expected to 'know their place' but to 'determine their own position'. A 'critical' and 'reflective' approach is frequently appreciated more than subservient accommodation. It is a question of making choices and knowing why you are making that choice, respecting the choices and opinions of others, communicating about these, thereby forming your own opinion, and making it known. Of course, the extent to which a 'critical' and 'reflective' approach is valued and by whom differs.

Today's health science educators must function in complex and changing health care systems, continuously refresh and update their knowledge and skills through critical thinking and reflection practices, and frame and solve complex patient and healthcare problems. Preparing professionals who possess these capabilities is correspondingly complex.

Critical thinking and reflective practice are traditionally viewed as underpinning the core uniprofessional curriculum has tended to remain a uniprofessional activity. In particular attention will be drawn to the nature of learning as a social and participatory activity founded on dialogue, thereby endorsing the nature of education as negotiated meaning rather than information transmission (Muir & Laxton, 2012).

Critical thinking and reflective practice are frequently noted in the general education literature and are increasingly described as essential attributes of competent health care professionals who are prepared to address these challenges (Mann, Gordon & MacLeod, 2009). Critical thinkers and reflectors in health education exhibit these habits of the mind: confidence, contextual perspective, creativity, flexibility, inquistiveness, intellectual integrity, intuition, open-mindedness, perseverance, and reflection. Critical thinkers in health education practice the cognitive skills of analyzing, applying standards, discrimnating, information seeking, logical reasoning, predicting, and transforming knowledge" (Duffy, 2009).

First, to learn effectively from one's experience is critical in developing and maintaining competence across a practice lifetime. Most models of reflection include critical reflection on experience and practice that would enable identification of learning needs Scho¨n cited in (Ash & Clayton, 2009a). Secondly, as one's professional identity is developed, there are aspects of learning that require understanding of one's personal beliefs, attitudes and values, in the context of those of the professional culture; reflection offers an explicit approach to their integration Epstein citied in (Boud, 2002). Thirdly, building integrated knowledge bases requires an active approach to learning that leads to understanding and linking new to existing knowledge.

Yet, despite reflection's currency as a topic of educational importance, and the presence of several helpful models, there is surprisingly little to guide educators in their work to understand and develop reflective ability in their learners. Further, the literature is dispersed across several fields, including education, health education and psychology, among others. In each field, underlying values, and 'cognitive' and 'normative' maps differ (Clark, 2006), making common terminology and understanding a challenge.

The study therefore designed to evaluate the existing evidences about critical thinking and reflective practice and their utility in health professional education. The researcher in consistent with Kolb's cited in (Duffy, 2009) observations agreed that in observing and analysing current trends, it may be possible to identify simplified models of experience for the common characteristics of teaching and learning that promote critical thinking and reflective practice.

2. REVIEW OF LITERATURE

2.1 CONCEPTS OF CRITICAL THINKING

Psychologists conceptualize critical thinking first and foremost as higher-order thinking skills and focus attention on the appropriate learning and teaching processes Kuhn (Mann, Gordon & MacLeod, 2009). Lastly, the concept of critical thinking functions in 'critical pedagogy'. Critical thinking refers here to the capacity to recognize and overcome social injustice (Ash & Clayton, 2009b). Although we share the critical pedagogical point of view, especially the emphasis on critical and democratic citizenship as an educational goal and the focus on transforming society (Ash & Clayton, 2009b), in our review of the research literature it primarily focus on psychology-oriented research. Obviously the reason for this lies in our concern with the development of adequate instructional designs for enhancing critical thinking. Ten Dam et al define critical thinking as 'reasonable reflective thinking that is focused on deciding what to believe or do'. Critical thinking includes such acts as 'formulating hypotheses, alternative ways of viewing a problem, questions, possible solutions, and plans for investigating something'. In his definition, Ten Dam et al distinguishes between skills (analyzing arguments, judging credibility of sources, identifying the focus of the issue, and answering and asking clarifying and/or challenging questions) and attitudes, the so-called dispositions (be prepared to determine and maintain focus on the conclusion or question, willing to take the whole situation into account, prepared to seek and offer reasons, amenable to being well informed, willing to look for alternatives, and withholding judgement when evidence and reasons are insufficient).

Central to the interpretation of critical thinking is a realization that critical thinking is not a method to be learned, but rather a process, an orientation of the mind and so, includes both the cognitive and affective domains of reasoning. As a concept, critical thinking has been expressed in several ways. A major influence in critical thinking traces back to the work of Dewey cited in (Dyke, 2006). From a philosophical perspective Dewey proposes that critical thinking

involves suspension of judgement and healthy scepticism. Another writer such as Fook (2006:83) suggest students should be assisted in the engagement of thinking that is reflective, reasonable and directed on what to believe or do. Fook views critical thinking as "*the correct assessing of statements*" and notes an individual who is able to think critically, according to this definition, it has the skills to evaluate statements. This consensus was acknowledged by the Corley and Eades (2006:4).

The ability to develop critical thinking skills may be likened to Piaget‟s concrete and formal operations since stages of cognitive development are linked to intellectual potential and environmental experiences (Nehring & Lashley, 2004). When students have not reached the formal operations stage their ability to use critical thinking skills is likely to be limited by an inability to handle abstract ideas. However, if learning environments are crucial to developing students' critical thinking skills, what instructional strategies should be used to promote it?

The Critical Thinking Community defined critical thinking as "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (Scriven & Paul, 2007:1). Critical thinking has also been referred to as metacognition (Mamede& Schmidt, 2004) or the process of "thinking about thinking" as defined and originally purposed by Flavell citied in (Kumar & Natarajan, 2007). Critical thinking skills are important because they enable students "to deal effectively with social, scientific, and practical problems" (Ash & Clayton, 2009b: 42). Simply put, students who are able to think critically are able to solve problems effectively. Merely having knowledge or information is not enough. To be effective in the workplace (and in their personal lives), students must be able to solve problems to make effective decisions; they must be able to think critically.

Critical thinking is associated with elements such as knowledge, active argumentation, reasoning, initiative, intuition, application, analyzing complex meanings, identification of problems, envisioning alternatives and making contingency related value judgements. Critical thinking is substantially larger than the sum of its parts, because it is a process that promotes attitudes to continuously explore, redefine or understand. All these factors contribute to a process of purposeful reasoned interaction between a person and their interaction with a situation or surrounding circumstances. Wheeler and Collins (2003:169) explain that the critical thinking process is multifaceted and further state that "*it is similar to an umbrella under which many types of thinking flow, depending on the situation*".

According to Banning (2006), critical thinking involves scrutinizing, differentiating and appraising information as well as reflecting on the information that will be used to make judgments and inform clinical decisions. Brookfield cited in (Coke, 2009) asserts that identifying, challenging, and analyzing assumptions for validity are essential. Because critical thinkers possess curiosity and skepticism, he opines that they are more likely to be motivated to provide solutions that resolve contradictions.

2.1.1 COMPONENTS OF CRITICAL THINKING

Ekebergh (2007) identifies four components of critical thinking. Firstly, identifying and challenging assumptions is considered a major tenet of critical thinking. Critical thinkers are always mindful of how assimilated assumptions shape their perceptions, understandings and interpretations of themselves and the world around them. Secondly, promoting the importance of context is crucial to critical thinking. The third component relates to critical thinkers having the capacity to imagine and explore alternatives, that is, they are lateral in thought processes. Lastly, reflective skepticism–this author refers to individuals who recognize alternatives to supposedly fixed belief systems, habitual behaviours and entrenched social structures. Thus, individuals who are critical thinkers become skeptical of claims to universal truths or to ultimate explanations and do not take things for granted or as real. For example, they become suspicious of those who claim to have the solutions to all of life's problems. Therefore, learning to think critically involves expanding a person's thought processes.

The premise that critical thinking is to knowing as listening is to hearing implies that critical thinking is a learned skill that must be developed, practiced, and continually integrated into the curriculum to engage students in active learning. To support this premise, focused attention needs to be placed on the application of content, the process of learning, and methods of assessment. In terms of the application of content, teaching techniques that promote memorization (often temporary knowledge) do not support critical thinking. Although some content, such as vocabulary definitions, do require memory, it is the application of the content that stimulates thinking. Instruction that supports critical thinking uses questioning techniques that require students to analyze, synthesize, and evaluate information to solve problems and make decisions (think) rather than merely to repeat information (memorize). Because critical thinking is a mental habit that requires students to think about their thinking and about improving the process, it requires students to use higher-order thinking skills – not memorize data or accept what they read or are told without critically thinking about it (Boud, Cressey, Docherty, 2006). Therefore, critical thinking is a product of education, training, and practice.

2.1.2 THE DIMENSIONS OF CRITICAL THINKING

The dimensions of critical thinking comprise of both (a) cognitive skills and (b) affective dispositions. Scriven and Paul (2007) state that having the requisite cognitive critical thinking skills is essential to being a good critical thinker. The concept of critical thinking is also associated with a set of personal attitudes or dispositions that can be used to describe an individual who is inclined to use critical thinking.

(a) The *cognitive critical thinking skills* can be understood as:

- *Interpretation*: accurately interpreting problems as well as objective and subjective data from common information sources, related to the care of the patient;
- *Analysis*: examining ideas/arguments in problems, objective and subjective data and possible courses of action related to the care of the patient;
- *Inference*: querying claims, assessing arguments (recognizes faulty reasoning) and reaching conclusions which are appropriate to the care of the patient;
- *Explanation*: clearly explaining and defending the reasoning in which an individual arrives at specific decisions in the context of the health care of the patient;
- *Evaluation*: evaluating information to ascertain its probable trustworthiness as well as its relevance to particular patient care situations; and
- *Self-Regulation*: constantly monitoring one's own thinking using universal criteria. For example, clarity, precision, accuracy, consistency, logicalness, significance etc. and correcting oneself as appropriate in the context of caring for patients.

These skills are employed interactively in the reflective reasoning process of making a judgement of what to believe or do. Therefore, in thinking critically, a person not only tries to determine judiciously what to do or what to believe, a person is also able to apply the core critical thinking skills to one another. In other words, one may analyze one's own inferences, explain one's own interpretation or evaluate one's own analysis.

(b) *Affective dispositions*: an individual's disposition is explained as:

- *Open-minded*: having an appreciation of alternate perspectives and willingness to respect the right of others to hold different opinions. Understanding other cultural traditions in order to gain perspectives on self and for others;
- *Inquisitive*: curious and enthusiastic in wanting to acquire knowledge, wanting to know how things work, even when the applications are not immediately apparent;
- *Truth-Seeking*: courageous about asking questions to obtain the best knowledge, even if such knowledge may fail to support one's preconceptions, beliefs or interests;
- *Analytical*: Thinking analytically and using verifiable information. Demanding the application of reason and evidence and the inclination to anticipate consequences;
- *Systematic*: valuing organization and a focused and diligent approach to problems of all levels of complexity; and
- *Self-Confident*: trusting one's own reasoning and inclination to utilize these skills, rather than other strategies, in order to respond to problems. For example, making decisions based on scientific evidence and responding to the values and interests of individuals and society.

2.1.3 BARRIERS TO CRITICAL THINKING

Critical thinking is not an innate ability. Although some students may be naturally inquisitive, they require training to become systematically analytical, fair, and open-minded in their pursuit of knowledge. With these skills, students can become confident in their reasoning and apply their critical thinking ability to any content area or discipline Lundquist cited in (Brodie & Irving, 2007). Critical thinking is often compared to the scientific method; it is a systematic and procedural

approach to the process of thinking (Scriven & Paul, 2007). Just as students learn the process of the scientific method, they must also learn the process of critically thinking.

Four barriers often impede the integration of critical thinking in education: (1) lack of training, (2) lack of information, (3) preconceptions, and (4) time constraints. First, teachers often are not trained in critical thinking methodology (Broadbear, 2003). Elementary and secondary teachers know their content and receive training in the methods of instruction, but little if any of their training is devoted specifically to how to teach critical thinking skills. Post-secondary instructors pursue additional content-based instruction during graduate school, but often have no formal methodological training, much less skill-based instruction. Second, few instructional materials provide critical thinking resources (Brodie & Irving, 2007). Some textbooks provide chapter-based critical thinking discussion questions, but instructional materials often lack additional critical thinking resources.

Third, both teachers and students have preconceptions about the content that blocks their ability to think critically about the material. Preconceptions such as personal bias partiality prohibit critical thinking because they obviate analytical skills such as being fair, open-minded, and inquisitive about a topic (Lee & Tan, 2004). A critical analysis of the information provided on this typesetting topic would support the use of a single space; however, strong biases for two spaces preclude many teachers (predominantly typing teachers) from changing their opinion and adopting the acceptable procedure.

Finally, time constraints are barriers to integrating critical thinking skills in the classroom. Instructors often have a great deal of content to cover within a short time period. When the focus is on content rather than student learning, shortcuts such as lectures and objective tests become the norm. Lecturing is faster and easier than integrating project-based learning opportunities. Objective tests are faster to take (and grade) than subjective assessments. However, research indicates that lecturing is not the best method of instruction, and objective tests are not the best method of assessment (Broadbear, 2003; Brodie & Irving, 2007).

2.1.4 INSTRUCTIONAL STRATEGIES USED TO TEACH CRITICAL THINKING

Sternberg cited in (Brodie & Irving, 2007 provides general guidelines for developing or selecting a program/curriculum that will foster critical thinking. He recommends that instructors focus on strengthening students' intellectual functioning in metacomponents, performance components, and knowledge-acquisition strategies. Meta-components refer to higher order mental processes that require planning, monitoring, and evaluating individuals' actions. Performance components are the actual steps taken or strategies used, while knowledge-acquisition strategies refer to the ways that individuals relate old to new material and apply new material. Notably, Sternberg believes that the learning experiences provided during the formative school years are insufficient for learning how to solve problems and dealing with the critical thinking tasks that students will eventually face in everyday life. Exemplifying his point, he reports that the predominate use of tasks that demand right answers and truth telling as well as administering objectively scored tests, which is characteristic of formative education, do not contribute to the development of or require the use of critical thinking.

2.1.5 MODELING CRITICAL THINKING SKILLS

Students are not born with the ability to think *critically*, and their prior learning experiences often do not require them to think critically. Therefore, instructors who wish to integrate this skill in their classroom experiences must first model the behavior (Harjai & Tiwari, 2009). Students must learn how to think critically before they can apply the skill to content scenarios. Modeling can be demonstrated in a discussion setting by asking a question and "walking students through" the process of critically thinking.

Further, critical thinking activities should be based on a structure that includes four elements: "ill-structured problems, criteria for assessing thinking, student assessment of thinking, and improvement of thinking" (Broadbear, 2003:7). Ill-structured problems are questions, case studies, or scenarios that do not have a definite right or wrong answer; they include debatable issues that require "reflective judgment." For example, asking students to evaluate comparable websites, such as Wal-Mart and Target, requires them to think about the content of the websites, their format, and their usability. Right and wrong answers do not exist as long as the student's choice is supported by logical reasoning. The second element, criteria for assessing thinking, provides students with a framework for thinking about their thinking. Providing students with individualized feedback based on their responses allows them to address specific criteria upon which they can assess their thinking, which is the third element. If instructors model the criteria for assessing thinking and provide a framework, students will eventually apply these techniques on their own Lundquist cited in (Coker, 2009).

2.1.6 GUIDING STUDENTS' CRITICAL THINKING

When students are accustomed to being passive learners by merely memorizing and recalling information, it may be difficult at first to engage them in active learning situations that require critical thinking skills (Ruff, 2005). Instructors should be aware of students' initial resistance and guide them through the process to create a learning environment where students feel comfortable thinking through an answer rather than simply having an answer. For example, peer coaching techniques can engage students in active learning and critical thinking opportunities (Hesterberg, 2005). Assign students to two-person teams; one student is the problem-solver, and the other is the peer coach. Using the *Six Steps to Effective Thinking and Problem Solving,* or "IDEALS" (Facione, 2007), the problem-solver works through a case study or activity by responding to questions from the peer coach. The *IDEALS* are to Identify, Define, Enumerate, Analyze, List, and Self-Correct:

- *Identify* the Problem: *What is the real question we are facing?*
- *Define* the Context: *What are the facts that frame this problem?*
- *Enumerat***e** the Choices: *What are plausible options?*
- *Analyze* Options: *What is the best course of action?*
- *List* Reasons Explicitly: *Why is this the best course of action?*
- *Self-Correct***:** *Look at it again … What did we miss?*

This problem-solving technique guides students through the critical thinking process and utilizes learner collaboration. Similar strategies include integrating project-based learning activities that require students to apply their knowledge by constructing a real-world product. As a final guide to student practice, use peer assessments to facilitate students' critical thinking and meta-cognitive skills (Hesterberg, 2005).

2.2 CONCEPTS OF REFLECTIVE PRACTICE

The term 'reflective practice' carries multiple meanings that range from the idea of professionals engaging in solitary introspection to that of engaging in critical dialogue with others. Practitioners may embrace it occasionally in formal, explicit ways or use it more fluidly in ongoing, tacit ways. For some, reflective practice simply refers to adopting a thinking approach to practice. Others see it as self-indulgent navel gazing. For others still, it involves carefully structured and crafted approaches towards being reflective about one's experiences in practice.

Within this general meaning, reflective practice is accepted as being a key component of professional education and practice in health and social care, adopted by traditional models of professional education as a fundamental foundation of professional development, essential for the integration of theory and practice. However such approaches have tended to be located within uniprofessional frameworks albeit drawing on some key theoretical underpinnings. Additionally, whilst the notion of reflective practice is almost universally agreed to be a 'good thing', it has been suggested that reflective practice has taken on a 'common sense' meaning, 'used in common sense terms rather than with reference to the literature.' Dyke (2006:115). In reality variations in meaning and practice within and between professions have the potential to obfuscate rather than promote effective communication and sharing of thinking and practice.

Reflexivity is frequently confused with reflection although some would argue that the two are inextricably linked. Lee and Tan (2004:127) explain this by referring to the process of circularity whereby the process of reflection itself influences future action in an ongoing feedback mechanism. *Reflexivity means that we constantly get evidence about how effective or worthwhile our actions are, and we can change what we are doing according to the evidence of its value. To do so, of course, require being reflective…..* This point is also made by Fook (2006) who comments that although the notions of reflection and reflexion may have different origins, they are not mutually exclusive and that the process of the former may assist the latter.

2.2.1 REFLECTION, CRITICAL REFLECTION AND REFLEXIVITY

Contemporary writing on reflective practice invites professionals to engage in both personal reflection and broader social critique. Other authors argue for the concept of *critical reflection***,** which is seen as offering a more thorough-going form of reflection through the use of critical theory Brookfield citied in (Black &

Plowright, 2007). For adherents of critical reflection, reflection on its own tends to "remain at the level of relatively undisruptive changes in techniques or superficial thinking" (Fook, White & Gardner, 2006:9). In contrast, critical reflection involves attending to discourse and social and political analysis; it seeks to enable transformative social action and change. For Fook (2006), critical reflection "enables an understanding of the way (socially dominant) assumptions may be socially restrictive, and thus enables new, more empowering ideas and practices. Critical reflection thus enables social change beginning at individual levels. Once individuals become aware of the hidden power of ideas they have absorbed unwittingly from their social contexts, they are then freed to make choices on their own terms."

In practice, introspection is the dominant mode of reflective practice. Sometimes presented as merely a promising personal attribute (Loughran, 2006), it is a predominantly individualistic and personal exercise (Rodgers, 2002) in which practitioners tend to focus on their own thoughts, feelings, behaviours and evaluations. This passes as legitimate 'reflective practice' which professionals then can use to advance their cause to fit formal requirements for continuing professional development. While such reflective practice may take place in dialogical contexts such as supervision sessions, the onus stays on the individual practitioner to reflect upon and evaluate their own practice. What is lacking is any mutual, reciprocal, shared process. Institutional structures and quality assurance systems encourage, perhaps even require, this individual focus. It starts early on during professional education and training where learners engage professional socialisation and are taught how to reflect, using structured models of reflection.

2.2.2 REFLECTIVE PRACTICE AND LEARNING STYLES

Kolb cited in (Shea et al, 2010) defined learning as: "the process whereby knowledge is created through the transformation of experience". In this way, Kolb illustrates that the cognitive and affective realms are inextricably connected within the learning process. As asserted by O'Conno and Hyde (2005), previous and/or current experience inevitably involves itself in all learning in some form. Whilst experiential learning can occasionally be misunderstood and thought of simply as games and activities, Kolb asserts that experiential learning is only useful when its methods help to create a learning environment in which the learners' ability to learn from their own experience is enhanced. The most valuable experiential learning activities are those which are self-sustaining and encourage learner autonomy.

Kolb's underpinning theory is that an individual learns from having an experience (CE) reflects on that experience (RO)reconstructs what has been learnt (AC) and applies the new learning (AE) in future situations. Kolb later suggested however, that an individual may emphasise a preference for one of the four different modes of learning derived from bi-polar opposites of the four modes. This implies that paramedic students outside the bi-polarity of CE/RO and AC/RO may be not comfortable with reflective practice as a learning concept. If so, could their views of the subject be distinctly different to other styles of learners? Additionally a central feature of Kolb's work is that the four different phases of the cycle are linked to four different learning styles.

2.2.3 MODELLING REFLECTIVE PRACTICE

A number of models of reflection have been advanced in different fields of professional practice and education. Ghaye and Lillyman cited in (Fook, 2006) identify five different types: structured, hierarchical, iterative, synthetic and holistic. Models vary in their levels of prescription, explanation, criticality and reflexivity, but most share a focus on reflection as being essentially retrospective (Schon's reflection-on-action).

In the nursing field, one of the models of reflection most commonly cited is Gibbs' Reflective Cycle cited in (Fook, White &Gardner, 2006). Built from Kolb's experiential learning cycle, it proposes that theory and practice enrich each other in a never-ending circle. Originally conceived as a "de-briefing sequence" (2006:46), Gibbs' cycle has become adopted in nursing and other professional education as a way to facilitate reflection.

In summary, different conceptions and models of reflective practice continue to emerge across different professional groups. Paradoxically, the demand for better (i.e. more thoughtful, reflexive and critical) reflective practice has tended to generate yet more models or typologies - which, if used blindly or unthinkingly, can render practice more mechanical and externally subscribed. This, of course, is the very antithesis of Schon's notion of 'professional artistry'. In the end, it seems neither possible nor desirable to fix on any one model as the definitive 'answer'. Different models are needed, at different levels, for different individuals, disciplines and organisations, to use in different contexts. Professional practice and education are also likely to benefit from the stimulus – and challenge – provided by competing perspectives and multiple models. *Models need to be applied selectively, purposefully, flexibly and judiciously*. Given the growing call for more critical and reflexive approaches to reflective practice, the first step in this direction must be to take a critical look at its current state.

2.2.4 STUDENTS' UNDERSTANDING OF REFLECTIVE PRACTICE

A notable gap in the literature emerges from the lack of empirical work regarding what students' understand by reflection. Newell cited in (Carrollet al., 2002) for example noted that despite its growing prominence work in nursing, identifying students' knowledge and understanding of reflection was minimal. Yet it is interesting to note that over a decade later reflective practice retains its appeal. Nurse educators continue to consider it an essential component of nursing education e.g. O'Connor and Hyde (2005) although supporting empirical evidence is lacking. It appears that where studies have been undertaken in nursing especially they have been mainly with post graduate students and using small samples and single methodologies such as focus groups regarding clinical practice (Glaze, 2002).

2.2.5 ATTITUDES TO REFLECTION

The relationship between attitudes and reflective practice appear to have been largely overlooked in the literature although attitudinal measurements have been widely researched in many diverse areas of education for different purposes. The general consensus is that attitudes are integral to learning and behaviour and that it can drive such outcomes. The importance of a positive attitude to reflective thinking is a key ingredient advocated by some theorists, especially the earliest proponent. Dewey suggested that reflective thinking required a supporting value of 'positive attitudes' that were favourable to reflective thinking and enquiry.

However, a later a qualitative study of attitudes to academic work with fourth year medical students by Bolton(2003) has since identified the need to minimize negative attitudes for promoting reflective practice in the undergraduate curriculum. One other study by Rees et al (2003) of attitudes to reflective practice and continuing professional development in pharmacy found that students considered reflective practice to be good in theory but not in practice. It is justifiable therefore to identify and compare the attitudes of undergraduate paramedic students to nursing students as a different discipline and establish whether or not it influences their learning experiences of reflective practice.

2.2.6 METHODS AND TOOLS FOR REFLECTION

Despite the reported lack of clarity about what reflective practice means a significant part of the literature concerns how it might be approached for enhancing learning and teaching. A variety of tools including the use of reflective learning journals, critical incidents and models/frameworks have been used to encourage reflective practice with health care and other professionals (Cole, 2000). The literature in the context of higher education has especially promoted the concept of 'structured reflection' through the use of such strategies and are pertinent to the students in this research project who are expected to be able to demonstrate the use of structured approaches throughout their academic study.

2.2.7 CRITIQUING REFLECTIVE PRACTICE

That reflective practice is a desirable, foundational dimension of professional action and life-long learning is often taken as self-evident. Whether the rhetoric emanates from colleagues, professional bodies, educators, management, or the government, practitioners are forever being exhorted to reflect and to critically evaluate their performance. Yet, as Brookfield cited in (Gustafson et al., 2007) notes, there are few intellectual quests so enthusiastically lauded for such meagre, unsatisfactory returns.

Done well and effectively, reflective practice can be an enormously powerful tool to examine and transform practice. Ghaye(2005) recommends that this self-development process be encouraged in any field whose members work with people. However, reflective practice is not without its 'dark side'. There are cultural and personal risks involved, and not everyone ends up feeling empowered Brookfield cited in (Gustafson et al., 2007). Moreover, busy, over-stretched professionals are likely to find reflective practice taxing and difficult.

3. IMPORTANCE OF THE STUDY

This study argues for a refinement of critical thinking and reflective practice concepts, the *theory - practice gap of* health education students regarding these concepts and new pedagogic approaches to its application in the health education curriculum. The contributions to knowledge are significant to health education professional and educational developments as an emerging higher education discipline and its quest for critical thinkers and reflective practitioners (as already established in other allied health disciplines such as nursing and physiotherapy). It also emphasises 'focuses and 'reflective action' for learning. The framework accommodates critical thinking and reflective practice for both personal and collaborative learning outcomes that are aligned to 'situated learning' concepts which importantly reflect the health education professional learning and clinical contexts. Other contributions include the support for the development of critical thinking and reflective practice through clinical simulation and recommendations for future research in the wider health education contexts elsewhere and beyond undergraduate study.

Further, this study defends a refinement of critical thinking and reflective practice concepts and new pedagogic approaches to its application in the health science curriculum. The following are the areas within which the contributions have been made:

- Critical thinking and reflective practice structures applied to undergraduate health science students.
- Critical thinking and reflective practice indicators for reflection during and after practice.
- A refinement and re-definition of critical thinking and reflective practice.
- A new pedagogic framework for further development and testing of critical thinking and reflective practice learning and teaching outcomes.
- Simulation learning as an educational tool for critical thinking and reflective practice developments.

4. STATEMENT OF THE PROBLEM

Critical thinking and reflective practice in health education is considered to be a significant learning and teaching strategy (Ash & Clayton, 2009a). However, there is a lack of empirical evidence to support its implementation and use in health education. Thus as a curriculum outcome similar to that for the health students it was important to know if health education students believed that they understood critical thinking and reflective practice, how they perceived its usefulness to their academic and clinical learning and what attitudes they held towards such approaches. In this study, the researcher focuses on the question of instructional strategies for enhancing critical thinking and reflective practice. The central tenet is that critical thinking and reflective practice are crucial aspects in the competent citizens needs to participate in a plural and democratic society, and that enable them to make their own contributions to that society (Mann, Gordon & MacLeod, 2009). Hence instructional strategies for critical thinking and reflective practice are very important. Different literatures on the teaching and learning of critical thinking primarily focuses on critical thinking and reflective practice as a higher-order cognitive skill rather than critical thinking as a competence for critical participation in modern society.

The rationale for undertaking this piece of work was threefold. First, as the health education profession has become more education rather than training focussed this research was considered to be timely in response to the increasing emphasis by higher education and health service providers for health education students to become reflective practitioners (Quality Assurance Agency for Higher Education (QAAHE, 2004). Second, as an example of curriculum innovation locally and nationally a need was identified to evaluate the extent to which students had perceived and embed critical thinking and reflective practice within their learning experiences particularly at the point of imminent transfer to graduate practice as reflective practitioners. Critical thinking and reflective practice in health education practice is identified as an important educational strategy for enhanced care delivery and continuing professional development. Currently this is an initiative that lacks empirical evidence to support the continued growth and implementation of critical thinking and reflective practice in the undergraduate curriculum and the health education context generally although it appears that this problem applies to other health care disciplines. Notably, similar questions have been raised about the implementation of reflective practice in nursing curricula (Carroll et al, 2002; Duffy, 2009) even though it has been much longer established within that discipline. It appears also that *"consideration of the context in which reflective action is engaged is a seriously underdeveloped aspect of discussion of reflection"* (Boud, 2002:97). As such the undergraduate paramedic context seemed a reasonable and justifiable starting point for establishing how reflective practice exists in that specific context which is different to nursing. Thirdly, the motivation for this work also arose out of my personal reflective enquiry as an educator with professional responsibilities for curriculum development.

Critical thinking and reflective practice outcomes in the health educational context are designed to ultimately influence professional practice and patient care outcomes and therefore are worthy of study.

The relationships between beliefs, attitudes and individual learning styles to critical thinking and reflective practice concepts have important theory to practice implications in the health education curriculum context and are therefore useful to establish for learning and teaching purposes. The extent to which such factors interrelate to critical thinking and reflective practice learning in the health education context as a new area of curriculum implementation appeared to be lacking and was therefore considered worthwhile to investigate for informing further developments.

5. OBJECTIVES OF THE STUDY

The overall purpose of the research was to explore the extent to which critical thinking and reflective practice influenced and interrelated to the learning experiences of undergraduate health education students. Hence, the following intended outcomes were anticipated:

- Identification of health education students' perceptions, attitudes and applications of critical thinking and reflective practice concepts to academic studies and clinical practice leading up to the point of transfer to graduate practice;
- Critical analyses of health education students' learning styles relationships to critical thinking and reflective practice;
- Refinement of critical thinking and reflective practice concepts relevant to the health education student learning context; and
- Proposal of revised curriculum strategies for learning and teaching of critical thinking and reflective practice in health education.

6. RESEARCH QUESTIONS

Hence, this study set out to explore the following specific questions:

1. Do health education students believe that we understand the basic concepts of critical thinking and reflective practice, including structured reflection?
2. Do health education students perceive that concepts of critical thinking and reflective practice could be beneficial to our learning and clinical practice and if so how might they potentially apply them?
3. What are health students' attitudes towards critical thinking and reflective practice?
4. How do they rate the importance of their learning preferences including critical thinking and reflective methods?

7. RESEARCH METHODOLOGY

This part of the study describes and discusses the research methodology that informed the different phases of this research concerning the status of critical thinking and reflective practice in an undergraduate health education curriculum and the extent to which it influences the students' learning over a full curriculum cycle.

7.1 THE STUDY DESIGN

For reflective practice and the contextual issues discussed in this study, the overall research design is therefore described as 'exploratory'. This approach is highly appropriate to education and social sciences research i.e. when *"examining a new interest or when the subject of the study is relatively new and unstudied"* Babbie citied in (Creswell, 2009). Exploratory research also fits well with curriculum innovations such as the critical thinking and reflective practice in the health education as focussed upon here and where there is an identified need for evidence of new knowledge in a developing area. The researcher intention

was to explore the richness of the naturalistic education environment in which critical thinking and reflective practice was being developed to gain an overall profile of its impact on the students' learning experiences at different stages.

7.2 SAMPLING

The study in this research was conducted with convenience samples of undergraduate health school students i.e. *"they happen to be in the right place at the right time"* Burns and Grove citied in (Creswell, 2009). The benefits of this approach such as cost, time and accessibility were also considered and justified for achieving the intended research purpose and outcomes. Additionally, the rationale for a whole population approach for the study was justified on the basis that there would be sufficient numbers by sub-groups for meaningful analysis.

7.3 METHODS OF THE STUDY

The decision to utilise a mixed methods(triangulation) approach is supported by the literature, for example "*Mixed methods research designs are now an established feature of programme evaluation research and policy evaluation studies*" (Creswell, 2009:209). Further this author suggests that a combination of strategies can complement and enhance the scientific value of research.

Triangulation in the context of this research involved using different methods to look at different aspects of reflective practice at different stages of the students' learning experiences. Together, it was envisaged that the mixed approaches might produce a more holistic picture of reflective practice in the undergraduate curriculum. Previous studies on and critical thinking and reflective practice found in the literature appear to have been small scale in nature and generally used single approaches from the qualitative paradigm such as 'Focus Groups' (Creswell, 2009). Understandably, such approaches have been justified in terms of their compatibility with the philosophical basis of exploring the complexities of health care delivery (Boud, 2002) and therefore appropriate for small scale studies.

THE SURVEY QUESTIONNAIRES: An original questionnaire was designed to explore the relevant attributes that could have influenced the students' learning and embedding of reflective practice from a curriculum perspective. Surveys were chosen for of their suitability for evaluation research and their compatibility with obtaining an overview critical thinking and reflective practice that could inform learning and teaching policies which was one of the aims of the research.

The questionnaires used in the surveys contained both open and closed questions for identifying the students' beliefs, attitudes to critical thinking and reflective practice, learning preferences and relevant attributes. Oppenheim citied in (Creswell, 2009:128) proposes that "*closed questions can be attitudinal as well as factual"* and open questions are useful for obtaining respondents *"ideas in their own language, expressed spontaneously, and this spontaneity is often extremely worthwhile as a basis* for *new hypothesis"*.

OBSERVATION: The rationale for the observation study was to discover firsthand how students apply critical thinking and reflective practice in a work related setting prior to graduate practice with the added advantages of capturing physical and social events as they occur including language used (Sobral, 2005) and reflective conversations in a clinical context. This research utilised a naturalistic learning environment where it would be possible to observe both concepts of *reflection in and on action* within a coaching simulation context.

7.3.1 RELIABILITY

The extent to which the reliability of this research can be determined is explained in the measures that were used to reduce potential sources of errors. First, looking at the surveys used it is suggested that *"reliability of questionnaires may be inferred by a second administration of the instrument, comparing the responses with those of the first*" Best and Kahn citied in (Creswell, 2009). However, the questionnaires used for the study in this research were administered only once and to separate groups of students and on separate occasions so the retest for reliability was not possible. At the same time it was also considered that the students' experiences would be changing at different stages of the programme thus potentially influencing the learners' attitudes concerning reflective practice perceptions and understanding. It is likely therefore that any test- retest measure which is *"best used for things that are more stable over time such as intelligence"* would not be accurate or good measures of reliability for testing reflective practice.

7.3.2 VALIDITY

For the study conducted a number of different types of validity were considered regarding the quantitative and qualitative dimensions of the research. First that of 'content validity' which was concerned with the surveys and the extent to which the questions are closely aligned to the critical thinking and reflective practice concepts studied. Looking at the items in the questionnaires for the study a high content validity was anticipated as the content could be closely mapped to all components of the main research question i.e. critical thinking and reflective practice, structured reflection, attitude relationships and individual characteristics and learning preferences. As a subset of content validity these components could be also be said to represent 'face validity' i.e. the questionnaires used *"give the appearance of measuring the content"* Burns and Grove citied in (Creswell, 2009).

The second consideration was that of 'construct validity' i.e. *"the extent to which the outcomes, samples and setting represent the theoretical construct of interest"* Clarke citied in (Creswell, 2009). critical thinking and reflective practice as the theoretical construct of interest studied and the curriculum framework within which it is operationalised have been amply justified within the methods used to conduct the research. This was deemed highly appropriate to health students in a university context where the development of critical thinking and reflective practice had been identified as an alternative route to professional development than the traditional teaching and learning practices.

7.4 DATA ANALYSIS

The research design incorporated both quantitative and qualitative methods. Quantitative data were analysed using SPSS versions 17 throughout the different phases of the study. Where appropriate this was used to quantify and generate descriptive statistics of the characteristics of the samples and the students' responses to perceptions of critical thinking and reflective practice and their attitude ratings towards it. Examples of statistical measurements of the quantitative surveys in study included chi-square calculations for relationships between categorical variables such as level of study and perceptions of reflective practice, and t-test for comparative purposes with different groups of respondents. SPSS proved useful for ease of quantification, tabulations and the presentation of descriptive statistics in the form of graphical data, numbers and percentages, and for identifying any significant trends in the study.

Qualitative data was gathered to progress the research and obtain a clearer view of the students' personal understanding and use of critical thinking and reflective practice. As a starting point content analyses of the qualitative data concerning the students own views of critical thinking and reflective practice were thematically coded and categorized according to the six components of Gibbs' reflective cycle (Mann, Gordon & MacLeod, 2009).The six components as previously explained matched the undergraduate health curriculum framework which utilises Bloom's taxonomy of educational objectives. The components of Gibbs' cycle also provided a straightforward descriptive coding system that could be easily analysed quantitatively.

Analyses of the qualitative data in study further exploring reflective practice in the simulation context developed from the coding system formulated in study where it was possible to re-use the dimensions of Gibbs' cycle to categorise the debrief sessions representative of reflection-on-action and compare how students described and applied this concept. However, the observations of the simulated clinical practice activities subsequently identified a need for additional coding. The content analyses of the simulation practice (reflection-in-action) were coded according to an algorithm of health educational practice that follows a sequence of primary and secondary assessment and treatment guidelines. As such three layers of coding were identified that were then sub-classified in order to facilitate finer interpretations of the data.

8. RESULTS AND DISCUSSION

This part of the study describes and discusses the data collected through a survey questionnaires and observation to explore health education students' perceived understanding of critical thinking and reflective practice and the important sub-concepts which relate to the students' learning experiences i.e. Reflective Practice, Structured Reflection, Attitude Relationships and Learning Preferences.

8.1 RESULTS

The main results of the study are structured to summarize the relevant study that addressed each of these questions in relation to medicine, nursing and other health professional contexts. The results begin with a selection of demographic details related to age, gender and level of study that are presented for informing the main areas of the foundation study.

TABLE 1: AGE RANGE AND GENDER OF HEALTH EDUCATION STUDENTS

Age range	Percent
18-25 years	78.9%
26-35	17.8%
35 and above	3.3%
Sex: Male	87.8%
Female	12.2%

Table 1, above shows that the majorities of health students are within the 18-25 year range, and are male with the majority of the sample at their academic studies.

In the next set of questions the health students were asked whether they believed that they understood the term 'structured reflection' and about their attitudes towards it.

TABLE 2: COMPARISON OF NURSING STUDENTS UNDERSTANDING OF REFLECTIVE PRACTICE AND STRUCTURED REFLECTION

Items	Yes	No
Understanding of the term critical thinking and reflective practice	97.8%	2.2%
Understanding of the term structured reflection	76.4%	23.6%

Question were asked about the student respondents' perceived understanding of the term 'critical thinking' and/or 'reflective practice' and if thought it could be useful for their learning and for practice. Table 2, shows that as with critical thinking and reflective practice a majority of health students believed that they understood the term structured reflection. As shown however, the majority (97.8%) of positive responses to their beliefs of structured reflection were less than that for the term reflective practice suggesting that less student health perceived that they understood the concept of structured reflection. It is not possible however, to say what they understood by the term due to the closed nature of the question. This would have been useful to know, although the intention of the research was to explorations in the study with the main health education sample of students. Question were asked the students about their beliefs concerning the usefulness of critical thinking and reflective practice to their learning and clinical studies. A paired samples t-test also revealed a significant difference between the responses to the two questions (t [df = 87] = 4.89, $p < .001$) indicating that although a majority of health students believed that they have an understanding of the terms reflective practice and structured reflection there are significant differences in their individual perceptions.

Mamede and Schmidt (2004) found that critical thinking and reflective practice in medicine in their study had a five-factor structure: deliberate induction, which involves the physician taking time to reflect upon an unfamiliar problem; deliberate deduction, which occurs when a physician logically deduces the consequences of a number of possible hypotheses; testing, which involves evaluating predictions against the problem being explored; openness to reflection, occurring when a physician is willing to engage in such constructive activity when faced with an unfamiliar situation; and, meta-reasoning, which means that a physician is able to think critically about his or her own thinking processes. This five-factor model is not a step-by step process; rather, each factor is a unique dimension, overlapping and occurring during and following an event.

Using Likert measurements the health students were asked in question about their attitude towards structured reflection rated against four dimensions that is *Positive, Relaxed, Confident and Unsure.* The respondents showed that the health students' responses to these items. A series of chi-square tests showed significant differences for the items '*Positive*' (χ^2 [3] = 66.25, $p < .001$), '*Relaxed*' (χ^2 [3] = 49.77, $p < .001$), and '*Confident*' (χ^2 [3] = 34.97, $p <. 001$) being rated equally. Therefore overall it appears that the students' responses were significantly favourable towards the concept of structured reflection

A question asked the students "*How would you rate your ability to use structured reflection*?" A majority of the health students stated that their ability to use structured reflection was just acceptable or good. Table 3, relates to the students' health responses reported of their ability to use structured reflection. This table also shows that a significant majority of the students who perceived that they understood the concept also rated their ability to use structured reflection as acceptable or good (χ^2 [df=1] = 17.96, $p = .001$). This result suggests that there is a significant relationship between a perceived understanding of these concepts and a perceived ability to do it.

TABLE 3: UNDERSTANDING OF STRUCTURED REFLECTION IN RELATION TO ABILITY TO USE STRUCTURED REFLECTION

Items		How Would You Rate Your Ability To Use Structured Reflection?				
		Poor	Acceptable	Good	Very good	Total
Do you believe that you understand what is meant by the term structured reflection	Yes	2.3%	31.0%	41.4%	3.4%	78.2%
	No	5.7%	12.6%	3.4%		21.8%
Total		6.0%	43.7%	44.8%	3.4%	100%

It is interesting to note from the results in Table 3, that even those who believed that they did not understand the term (16%) nevertheless perceived that they had good or just acceptable abilities to use this concept. This result suggests that although individuals perceive that may have an inability to define something they may nevertheless perceive that they have an ability to use it. It is also possible that some students may feel that they do not need to understand something in order to do it.

The next part of this subset asked the students to rate the *importance* of structured reflection to their practice. Table 4 shows that a majority of health students agreed that structured reflection was an important part of nursing practice.

TABLE 4: HEALTH STUDENTS' ASSESSMENT OF THE IMPORTANCE OF STRUCTURED REFLECTION IN RELATION TO THEIR OWN ABILITY TO USE STRUCTURED REFLECTION

Items	How Would You Rate Your Ability To Use Structured Reflection?					
		Poor	Acceptable	Good	Very good	Total
If you have used structured reflection before do you agree that it is an important part of nursing practice	Strongly agree			9.5%	1.4%	10.8%
	agree	2.7%	28.4%	29.7%	2.7%	63.5%
	Neutral	2.7%	12.2%	8.1%		23.0%
	disagree		1.4%			1.4%
	Strongly disagree		1.4%			1.4%
Total		5.4%	43.2%	47.3%	4.1%	100.0%

It can be seen from Table 4, that although the majority of students agree/strongly agree that structured reflection is an important part of health education a number of students (nearly 20%) remained neutral to this question. This is surprising given that a majority of students were shown to have a significant positive attitude towards it.

Responses to Question were explored further to identify whether or not there was a relation between how students assessed the *importance* of structured reflection and their perceived *ability* to use it (Table 4).The results shown indicate that all students (100%) perceived they had used structured reflection. However a chi-square test showed that no significant association was found (χ^2 [df = 12] = 13.65, $p = 0.32$) between the nursing students' perceptions regarding the *importance* of structured reflection and their rating of their ability to use it.

Most studies identified in our review offered descriptions of reflective thinking; the researcher explored whether the process is amenable to valid and reliable assessment. Different studies addressed this question. In several of the studies, relationships with other variables were explored, as a means of validating the instruments used and assessments made.

From the studies reviewed, it appears that reflection can be assessed and different levels of reflection discerned. Further, the studies demonstrate that measures of reflection correlate with other measures in theoretically consistent ways. Students do not have the same opportunities as professionals do for reflective practice in authentic settings and therefore some questions remain regarding whether what is being measured is a valid indicator of reflective activity, when one considers the influences of context and culture. Despite these concerns, failure to assess reflection and reflective thinking may imply to learners lack of real value for this activity.

In this final closed question the students were asked to rate the importance of their preferred learning methods itemised in four categories adapted from the literature. This was a general attempt to identify whether or not nursing students preferred more 'active' ways of learning as suggested by Kolb's citied in (Coffield et al., 2004) research compared to the more thoughtful 'reflector' style of learning.

TABLE 5: THE IMPORTANCE OF THEIR PREFERRED LEARNING METHODS

Items	Not at all important	Not very important	Neutral	Quite important	Very important
	%	%	%	%	%
Learning through observing	-	-	2%	26%	72%
Thinking back	-	1%	4%	65%	30%
Learning from studying books	-	-	4%	46%	50%
Hands on experiences	-	-	1%	8%	90%

Table 5 above shows that for all 4 items, the health students perceived that all these particular types of learning approaches were appropriate for them. It is evident that they thought that each of the approaches were all *quite or very* important methods of learning. However, the high response to "hands on experience" suggests a particular preference for 'doing' or active experimentation. Kolb's study of learning styles applications to professional disciplines in higher education classified nurses as 'active experimenters'. The findings in this study nevertheless need to be treated cautiously as the ways in which nursing students interpreted the different ways of learning are purely descriptive and obtained in a classroom environment.

This section further explores the results of the key concepts analysed to identify any significant findings regarding the students' perceived understanding of reflective practice concepts and applications to their learning. A question was asked *how the different reflective practice concepts inter-relate to student healthy responses.* The intention with this separate question was to establish whether or not the students who perceived that they understood the term reflective practice similarly perceived the term structured reflection. A majority of the health students said they perceived an understanding of both terms as earlier seen in Table 4 although the responses were reduced for structured reflection. However, because of the closed nature of the questions it is neither possible to say what students perceived the different concepts to mean or to say what any similarities or differences may be.

Again because of the generally positive levels of understanding for reflective practice this item proved difficult to assess. A series of chi square tests presented below identify that no significant associations were found between the ways that students scored the 'importance' of learning through different methods including reflective ways such as 'observing and mulling over past experiences' (it has shown that): *Observing* (χ^2 [2] = 0.8, p = 0.67); *Mulling over past experiences* (χ^2 [3] = 1.09, p = 0.78); *Learning from books/attending lectures* (χ^2 [2] = 0.1, p = .95); and *Hands on experience* (χ^2 [2] = 0.2, p = 0.9).

Only one significant link was found between students' perceived understanding of structured reflection and their view of the importance of 'thinking back'. A chi square showed a significant relation (χ^2 [3] = 10.38, p = 0.016) between the two indicating that the students who did not understand the term structured reflection were less likely to identify 'thinking back' as an important method for learning. This would seem to be a logical response.

Table 6, below shows how students rated their understanding of structured reflection in relation to their views on the importance of 'thinking back' over past experiences as a way of learning .Thinking back is highly related to the concept of reflection-on-action.

TABLE 6: UNDERSTANDING OF STRUCTURED REFLECTION IN RELATION TO IMPORTANCE OF 'THINKING BACK'

Do you believe that you understand what is meant by the term structured reflection		The importance of student's learning-'thinking back'				Total
		Not at all important	No strong feelings	Quite important	Very important	
	Strongly agree	1.1%	2.2%	18%	2.2%	23.6%
	Agree	-	1.1%	48.3%	27%	67.4%
Total		1.1%	3.3%	66.33.3%	29.2%	100%

The results in Table 6, show that a significant majority (95.5%) of health students who believed that they understood structured reflection considered 'thinking back' as a being a highly important way of learning although even though Figure 5, showed that they perceived it to be less so (74 %) for their nursing practice.

8.2 DISCUSSION

The aim of the study was to explore a variety of critical thinking and reflective practice concepts focussing on their relationships to the context undergraduate health science students and to inform the subsequent study with the health students. This involved exploring the students' understanding of reflection concepts and its practical application in a health science context. It was also necessary to identify how critical thinking and reflective practice is manifested not only in what students write about it but also how it emerges in a professional work-related context that could inform theory-practice relationships within the health science curriculum . Other relevant variables explored included issues such as structured reflection, attitudes to reflective practice, the use of reflective tools, learning styles relationships and simulation based learning.

This was done by surveying the students' perceptions and attitudes concerning critical thinking and reflective practice and structured reflection and the perceived importance to their academic and health science students study. Hence, the following outcomes were achieved:

- Identification of health science students' perceptions of and attitudes to critical thinking and reflective practice concepts concerning their academic studies and clinical work.
- The application of critical thinking and reflective practice in health science context.
- Critical analyses of students' learning styles relationships to critical thinking and reflective practice methods.
- Evaluation of Clinical Simulation learning applied to critical thinking and reflective practice concepts in the paramedic context.
- Refinement and redefinition of critical thinking and reflective practice concepts including a new pedagogic framework that supports effective learning and teaching strategies for critical thinking and reflective practice developments in the health science undergraduate curriculum.

1. STUDENTS' GENERAL UNDERSTANDING OF CRITICAL THINKING AND REFLECTIVE PRACTICE

Two Questions focused on the students' health science' perceived understanding and were designed to establish whether or not the respondents believed that they understood the general meaning of critical thinking and reflective practice including its usefulness for their learning and practice. As indicated in Table 2, a significant majority of health science students believed they understood the term critical thinking and reflective practice. Given the lack of clarity reported in the literature this is considered an interesting result although it could have been influenced by what they had been taught been taught in the curriculum. However, as Palmer et al citied in (Dyke, 2006:65) state *"reflection is an idea used in ordinary and educational life"* consequently it may be a loose concept associated with spontaneous everyday thinking. Several studies explored the effect of context on critical thinking and reflective practice. Sobral (2005) found evidence for improved quality of learning as students strive for control of their learning. He suggests that a greater effort at reflection is associated with a more positive learning experience, and that reflection in learning is related to readiness for self regulated learning, and to the meaningfulness of the experience.

As before a majority of respondents said that the concept of critical thinking and reflective practice was indeed useful for both learning and clinical practice, indicating that students may have a certain level of knowledge about the application of critical thinking and reflective practice or at least experiences of operating in a reflective mode for the two purposes. The importance and use of relevant reflective learning methods applied to their academic learning, healthy

practice and learning preferences were also explored as part of the revised survey that is to find out what reflective tools had they used and how effective these were to their learning. The results of this survey showed that as with the health students a majority (97%) of the student respondents (mainly male) indicated that they believed they understood the terms critical thinking and reflective practice and sub-concepts such as structured reflection. Majorities also believed that critical thinking and reflective practice could be useful both for their learning (83%) and practice (83%). Statistical analyses showed that age was not a significant influencing factor regarding their perceptions although compared to the nursing students they appeared more favourable towards reflective ways of learning such as 'thinking back and observing'.

2. STUDENTS' GENERAL UNDERSTANDING OF STRUCTURED REFLECTION AND THEIR ATTITUDES TOWARDS IT

Four Questions are asked the students to rate whether or not they believed that they understood the term 'structured reflection'. The students were given a set of items derived from the literature that asked them to choose what they considered to be examples of structured reflection.

As with reflective practice a majority of students said that they did also understand the term structured reflection. The majority in this case however was significantly lower (23%) than for their perceived understanding of critical thinking and reflective practice, hence indicating that students did not all necessarily perceive both concepts in the same way, in particular structured reflection which appeared less coherently conceived.

Analysis of questions highlighted some differences in the students' understanding and applications of structured reflection. It was interesting to note that over 23% of the sample said that they did not understand the term structured reflection yet claimed to have acceptable abilities to use this concept. This result possibly suggests that knowing how to do something for some individuals does not necessarily follow a sequence of 'knowing what it means' something that is traditionally associated with formal learning i.e. theory before practice. Also that having practical abilities to do something might not necessarily depend on a theoretical understanding of it but by being able to follow tasks or rules associated with them. In other words the educational ideology of theory before practice does not appear to apply in this context. This proposal would however, need to be tested further beyond students' perceptions alone which by itself makes it difficult to tell.

With regards to the health science students' attitude towards structured reflection a series of attitude items using Likert measurements were presented to test whether the students were generally positive or negative in their attitude towards structured reflection. The results showed that although they were not all sure of their understanding a majority of the sample claim to have a positive attitude towards it. The importance of positive attitudes in the literature is considered to be a necessary condition for the reflective learning process e.g. Goodman citied in (Donaghy & Morss, 2000). Dewey citied in (Dyke, 2006) also advocated positive attitudes such as "wholeheartedness and open mindedness" whilst Boud et al citied in (Dyke, 2006:11) which suggest that "*negative feelings particularly about oneself can form major barriers towards learning".* Thus knowing that the majority of health science students generally have positive attitudes towards critical thinking and reflective practice concepts could be attributed to their motivation to learn and is therefore considered an important curriculum outcome for the implementation of critical thinking and reflective practice.

Concerning interpretations of structured reflection some interesting results emerged. Similar to reflection and reflective practice there are no concrete definitions of structured reflection in the literature although some writers (Moon, 2000; Rolfe et al, 2001) refer to 'structure' as written formalisms e.g. journal writing and guided frameworks. Although, the health science students in this study rated a range of methods in their inclusion or exclusion of structured reflection; a large majority (nearly 80%) perceived using a 'written framework' to be the most favoured representation of structured reflection which concurs with the literature.

Looking at the utility of 'structured reflection' however, just over 50% of the sample considered it to be important for their practice and considered that they were able to use it. When compared to asking the same questions for critical thinking and reflective practice the reduced majority responses for structured reflection suggest that there may possibly be something particular or specific in meaning and applications of these two concepts.

3. LEARNING PREFERENCES AND ASSOCIATIONS WITH CRITICAL THINKING AND REFLECTIVE LEARNING

This item in the questionnaire was designed with the specific purpose of identifying how students' rated the importance of reflective methods within a range of individual preferred ways of learning. The categories for the different ways were adapted from Honey and Mumford's citied in (Donaghy & Morss, 2000) four learning styles preferences (*Activist, Reflector, Theorist, Pragmatist*) i.e. learning by observing, by thinking back, by learning from lectures and reading or from trying things out for themselves.

The distribution of learning methods scored by the students showed that the majority favoured both the passive learning styles associated with reflective learning such as 'observations' and 'thinking back', as well as 'hands on' or active experimentation learning. However, a majority of nurses (Figure 4) rated the 'hands on' approach more highly than the other approaches such as 'thinking back' and 'observing' in indicating that they may not all have as strong a preference for reflective learning methods. Similarly the results shown in Table 4 and 5 suggest that although the students perceived structured reflection as being highly important to their learning they perceived it less important to nursing practice.

In the study of this research attempts were made to identify whether or not any significant relationships existed between the two concepts. Using both descriptive measures through the surveys and a Learning Style Indicator the results showed that regardless of self-scored learning styles the majority of students similarly described reflective practice meanings aligned to the dimensions Gibbs' cited in (Dyke,2006) Cycle, (*description, thoughts and feelings, evaluation, analysis, conclusion and future action*). The majority also indicated that critical thinking and reflective practice was both useful and important to their academic studies and practice. This was found to be the case in study even though the majority of that sample scored themselves in the 'Active Experimenter' category and who according to Kolb cited in (Fook, White &Gardner, 2006) would be more strongly orientated to *"practical applications as opposed to reflective understanding".*

4. DIFFERENCES BY LEVELS/YEARS OF STUDY

Academic levels/years of study appear to be an influential factor concerning what health science students include and exclude in their meanings of structured reflection. However, there are some notable inconsistencies in the overall findings of health science students' perceptions of these concepts. Analysis of the differences in perceptions of critical thinking and reflective practice and structured reflection by the students' level of academic study raises important issues relating to the literature on critical thinking and reflective practice meanings and how they are taught and learnt. An interpretation of the literature on critical thinking and reflective practice for this research indicates that the term acts as an umbrella concept encompassing many different activities, e.g. thinking, critical thinking, learning and a tool for professional practice (Moon, 2000: 3-4). Given the reported lack of consensus regarding definitions of reflective practice concepts it is therefore surprising that the majority of nurses claimed a perceived understanding of its meaning.

The final question was open ended and was intended to give students the freedom to express comments that would hopefully highlight any relevant areas that were overlooked by the researcher or perceived relevant to the students' beliefs and attitudes of critical thinking and reflective practice concepts applicable to themselves as individuals. The findings of these few studies suggest that reflective thinking may develop in association with certain interventions. It also appears that the development of reflective thinking is related to other aspects of learning and professional development. The methods employed were usually observational and analytical, and appropriate to the questions asked.

9. FINDINGS

The following sections provide an outline of the areas for discussion of the research findings.

1. STUDENTS' UNDERSTANDING OF CRITICAL THINKING AND REFLECTIVE PRACTICE CONCEPTS

Health education undergraduate students similar to private nursing students on an equivalent curriculum pathway believe that they understand the meaning of critical thinking and reflective practice including related concepts such as structured reflection even though the literature suggests that the term lacks clarification. This could be the result of what students had been taught, however structured reflection as a terminology is not defined within the health curriculum or elsewhere. Rather, it is implied in the literature that structured forms of reflection include formats such as written learning journals and reflective frameworks/cycles. Therefore the students' belief that they understood its meaning possibly derives from the literature rather than what they had been taught.

2. LEARNING STYLES RELATIONSHIPS AND ATTITUDES TO CRITICAL THINKING AND REFLECTIVE PRACTICE

According to the learning styles instrument used students' views about critical thinking and reflective practice were not found to be influenced by their individual learning styles. Health students generally had a positive attitude towards critical thinking and reflective practice.

3. STUDENTS' DEFINITIONS OF CRITICAL THINKING AND REFLECTIVE PRACTICE

Students defined and described critical thinking and reflective practice as a retrospective process only commensurate with reflection-on-action concepts, i.e. after an experience.

4. STUDENTS USE OF CRITICAL THINKING AND REFLECTIVE PRACTICE METHODS

Students overall indicated that they use the dimensions of Gibbs' (1988) reflective cycle as one of the main frameworks to assist their learning i.e*., description, thoughts and feelings, evaluation, analysis, conclusion and future actions,* although by the fourth and above years health students seem to prefer discursive methods. In second and third years health students seem to practice (oral debrief after an event) students focus most on analyses and least on *'conclusion'*.

5. STUDENTS USE A TECHNICAL/RATIONAL APPROACH TO CRITICAL THINKING AND REFLECTIVE PRACTICE

Students' viewed critical thinking and reflective practice as a tool for informing practice similar to prescribed protocols/guidelines. During and after practice four year health students' focused mainly on *primary clinical* and *technical* issues thus demonstrating a greater adherence to prescribed practices rather than evidence of on the spot thinking.

6. COMMUNICATION AS A KEY INDICATOR OF CRITICAL THINKING AND REFLECTION PRACTICE

In the simulation context, verbal communication emerged as a key supplementary action to direct actions during practice. The different types of verbal communication used in interactions with the patients and peers during practice are now coded into categories that can inform possible external representations of reflection-in-action.

7. SIMULATION LEARNING AS A REFLECTIVE PRACTICUM

Simulation learning using scenarios offers realistic potential for developing critical thinking and reflective practice learning and teaching strategies. However, the post simulation processes need to be facilitated in a more structured way to encourage students to 'synthesise' and inform future learning more explicitly. A new pedagogic framework for critical thinking and reflective practice offers an alternate solution.

10. RECOMMENDATION

While the study is still early in development, and not conclusive, the researcher offers the following implications for educational practice that educators may consider:

Critical thinking and reflective practice may be most useful when viewed as a learning strategy. Used in this way, it may assist learners to connect and integrate new learning to existing knowledge and skills. Reflection may also assist learners to explicitly integrate the affective aspects of their learning. This may be particularly beneficial in the health science learning environment, where many aspects of the professional role are experienced and learned.

Critical thinking and reflective practice, and its role in learning, may not be obvious to learners; it may also be a tacit process in experienced practitioners. An important task for teachers may be to model reflection on their own practice; i.e., to make their own reflective activities explicit. Further, including learners and inviting their contribution may demonstrate that reflection can be a collaborative, as well as an individual, experience. Experience with collaborative reflection may be important as a preparation for participation in interprofessional teams, where the ability to consider the cognitive approaches and values underlying the work of other professionals is important.

As with other skills, learners may need a structure to guide this activity, especially early in their learning. They may require feedback on both the content and the process of their reflection, both ''reflection-in-action'' and ''reflection-on-action.'' Reflection offers an opportunity to consider one's strengths and weaknesses, and to determine learning needs. Learners and teachers may be able to use reflection as one element of self-appraisal, encouraging learners to seek evidence and input to validate and enhance their own judgements.

The literature suggested repeatedly that guidance and supervision are keys to reflection and are factors that learners perceived to be beneficial to their learning. Therefore, as educators, it will want to ensure that when reflection is used as a learning strategy, the process is guided appropriately.

The environment for teaching and learning about reflection will be important. If the culture and environment do not value and legitimize this learning strategy, reflection may not be used, potential benefit may be lost, and negative reflective experiences may result. A key assumption underlying the literature on reflection is that it will enhance competence.

11. CONCLUSIONS

Critical thinking and reflective practice, although a popular concept in higher education and ubiquitous in the literature over the last twenty years continues to retain its popularity despite the reported lack of clarity and consensus of meaning. From the extensive literature reviewed it is apparent that many of the key theoretical ideas surrounding reflection-in- and on-action concepts are not empirically tested. In short, there is a lack of evidence that critical thinking and reflective practice is an effective proven strategy for the education of health care practitioners including health sciences. However, it has been demonstrated in this study that this situation can be improved by explorations of critical thinking and reflective practice in specific contexts.

The phases of this research exploring the applications of critical thinking and reflective practice to the learning experiences of health science students have produced some new and relevant findings that could better inform health and other health care curricula for future developments. For example, students believe that they understand the concept but this is limited to something that happens primarily after an event or experience.

Also it was found in the processes observed that the debrief simulation context lacked full reflectivity and could be better scaffolded by having a clearer learning and teaching focus. Communication in particular was identified as a key critical thinking and reflective practice indicator that helped to inform the findings that 'Technical Reflection' is a significant activity both during and after the students' practice. This could be a discipline related characteristic where time factor can be crucial to care outcomes, however technical reflection is not synonymous with a holistic model of care and the wider critical thinking required for practice.

These findings may be relevant to other disciplines that work in similar ways, where complexities and unexpected problems are characteristic of their clinical work critical, thinking and reflective practice is professionally benchmarked, e.g. medicine and physiotherapy. The findings of the research have also identified that there is need for a greater understanding of any new discipline to higher education. This is essential for the development of sound pedagogies and productive learning from critical thinking and reflective practice in order to expand its body of knowledge and clinical skills.

Further, this research has emphasised the importance of curriculum evaluations of educational innovations such as critical thinking and reflective practice in higher education if they are to be more effectively embedded for learning and work- related applications.

12. LIMITATIONS

The limitations of this research mainly concern the generalisability of the findings owing to the fact that the study conducted and the data collection took place in a single higher education institution with a unique population sample involved in an example of curriculum innovation. Consequently the conclusions reached may only be applicable to the population of undergraduate health science students studied in that particular curriculum context. As such the findings cannot be used to explain the reported lack of clarity regarding definitions of critical thinking and reflective practice found in the literature.

In addition as earlier highlighted in the use of predominantly closed questions for surveying the students' perceptions of critical thinking and reflective practice resulted in limited analyses and findings. Hence, a missed opportunity has been identified that could have possibly yielded substantial data to illuminate the students' understanding of critical thinking and reflective practice across all levels of study including those who were government and private. Critical thinking and reflective practice concerns at all levels of practice therefore using wider explorations and different methodologies for the further investigations of critical thinking and reflective practice influences in health sciences are strongly recommended.

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A STATISTICAL ANALYSIS OF PHYSICALLY DISABLED POPULATION: DEVELOPMENT IN REHABILITATION SCHEMES

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ABSTRACT

Physically disabled or handicapped people are the most vulnerable group in society. They include Blind, Visual Impairment, Deaf, Dumb, Orthopedically impaired, mentally retarded and few of the skin diseases affected people. The statistics of the physically disabled at the national and state level is provided in the paper. It is noted that the society should be sympathetic and supportive towards the disabled population, so that they can also develop as normal people and lead their life positively. The rehabilitation services and welfare schemes for the disabled are also discussed in the paper.

KEYWORDS

physically disabled population, rehabitation schemes.

INTRODUCTION

The loss or impairment of an organ or deformity in one's physical or mental capability is the worst that can happen to a person, whether it is because of nature's foul play or as a result of an unexpected unfortunate accident. Welfare of the disabled and the handicapped is an extremely challenging task and it can be fulfilled only when all the citizens, voluntary organizations and Government realize their responsibilities in this respect collectively (Sachdeva, 2006).

The disabled people are much significant components of the society as the healthy persons. It is the moral duty of every person in this society to do utmost for their rehabilitation and development. To a major extent, the handicapped have a zest for life and desire to live abnormally as possible and require only a change to prove that they can be as effective as anyone else at the tasks assigned to them. With a little bit of help and the handicapped can tide over their misfortune. Their skills and talents can form an important input in nation building activities. A sense of self-confidence, therefore, needed to be infused in them to enable them to join their brethren in the mainstream of life.

According to Akhileshwari (2008) disabled people in India are among the most excluded. Low literacy, low employment rates and widespread social stigma make the disabled one of the poorest in the country. Households with disabled members are significantly poorer than average, with lower consumption and fewer assets, according to a World Bank Report. The worst affected are children. Disabled children are four to five times less likely to be in school than children from Scheduled Caste and Scheduled Tribe families…Based on the National Sample Survey (NSS) 58th round, the World Bank report shows that nearly a third of children with mild disability are out of school, despite the fact that they need no aid or appliance to be able to attend school. Yet, irrespective of the levels of disability- mild moderate or severe- the disabled rarely progress beyond the primary school level. Hence, the present study is made to examine the services and welfare measures of the disabled children.

PHYSICALLY HANDICAPPED PEOPLE

The term 'Physically handicapped' often used synonymously with impairment and disability. As per the classification made by the World Health Organization (1980), these terms have three separate meanings, but related to same concepts, that is 'impairment' means 'loss of function', disability means 'loss of ability to perform specific tasks' and handicap means 'social and economic disadvantage'. It is noted that all of these words given only one concept, lack of some kind of physical or mental ability, which is possessed by other compared to a person. 'In the affluent industrialized societies, occupational hazards and age are the main causes while in developing as well as underdeveloped countries, ignorance, poverty, lack of elementary medical facilities and pseudo-religious beliefs are the principal causes of disability (Lal Das, 1997).

Physically handicapped or physically disabled includes all persons who have either completely lost the use of or can make only a restricted use of one or more of their physical organs. A Physically handicapped person is a perfectly normal being except for the handicap from which he suffers. Thus, he is capable of performing all the functions of a normal person except in so far as he is limited by his handicap. They are all disabled persons because they have one or the other type of physical handicap. The normal functioning of any one part of their body has become of no use. In medical terms Physical disability means a limitation of physical function of locomotor or sensory or of special organs irrespective of the cause…sociologically, a physical handicap is a physical defect, obvious or hidden which limits an individuals capacity to work or evokes an unfavourable attitude (Singh, 1997).

According to the International Labour Organization (ILO), a disabled person should be defined as an individual whose prospects of employment are seriously reduced as a result of physical impairment. All these groups of persons need assistance by way of special vocational training or by way of special types of work suited to their physical abilities and sometimes under sheltered or protected conditions. The causes of crippled ness are of two types, i.e. either some disease or an accident. For instance, it is possible for a blind person to perform any job for which the use of eyesight is not essential. An understanding of this fundamental fact is vital to the understanding of the problems of the physically handicapped. In general the handicapped people are classified on the basis of their disability as under.

1. Blind or Vision impairment
2. Deaf and Dumb
3. Orthopedically handicapped
4. Mentally handicapped.
5. Others (Including the persons with Leprosy, and other skin diseases)

The attitude of society towards the handicapped has undergone change as in the case of services for other weak groups such as children, etc. In the beginning asylums were established by charitably disposed persons, where the blind or the deaf were housed, clothed and fed, but gradually the idea of giving them instructions and subsequently giving them opportunities of gainful employment developed in course of time. In other words, emphasis has shifted from charity to recognition of the right of the handicapped individual to live and enjoy life as any other normal human being. It is necessary to emphasise that the old idea of asylum must give place to proper rehabilitation of the handicapped. In India, question is often raised as to why efforts should be made to educate and rehabilitate the blind, the deaf or the other type of physically handicapped persons, when millions of normal persons are without education or employment. But this has to be kept in view that every individual has the right to a full life. However, it is also to be kept in view that all handicapped persons cannot earn their own living. For instance, if a person becomes blind in his old age, he cannot be made capable of earning a livelihood and the community must make provision for his minimum comforts of life as has been done in some other countries through categorical assistance. It is noted that the total number of afflicted persons in India has hardly ever been correctly estimated. This is due to defective enumeration, lack of definitions and the desire of persons concerned to avoid publicity to their handicaps.

DISABLED POPULATION: STATISTICS

No statistical estimates are available on the disabled population up to 1981, as only deaf and blinds were only treated as disabled people by these census. Later in 1981, the kinds of disability were clearly defined in the Census. According to the Report on survey conducted by the National Sample Survey Organization sponsored by the Ministry of Welfare, twelve millions Indians about 1.8 percent of India's population have at least one disability or the other. About 10 percent of the handicapped are having more than one type of physical disability. Considering each type of disability separately, those having locomotor disabilities constitute the maximum number (5.43 millions), followed by those with visual disability (3.47 millions) and hearing disabilities (3.02 million) and speech disabilities (1.75 million). The survey covers blind crippled and dumb persons but does not cover other disabilities, including mental retardation (Johri, 2005).

TABLE NO. 1: DISABILITY-WISE AND STATE-WISE NUMBER OF PERSONS WITH DISABILITIES IN INDIA (CENSUS OF INDIA, 2001)

Sl.No	State	Visual disability	Speech disability	Hearing disability	Locomotor disability	Mental disability			Total
						Total	Rural	Urban	
1	Jammu & Kashmir	208,713	16956	14,157	37,965	24,879	18,959	5,920	302,670
2	Himachal Pradesh	64,122	12,762	15,239	46,512	17,315	15,975	1,340	155,950
3	Punjab	170,853	22,756	17,348	149,758	63,808	43,016	20,792	424,523
4	Chandigarh	8,422	882	607	3,828	1,799	163	1,636	15,538
5	Uttaranchal	85,668	16,749	15,990	56,474	19,888	15,082	4,806	194,769
6	Haryana	201,358	24,920	27,682	151,485	49,595	34,309	15,286	455,040
7	Delhi	120,712	15,505	8,741	64,885	26,043	1,543	24,500	235,886
8	Rajasthan	753,962	73,147	75,235	400,577	109,058	80,019	29,039	1,411,979
9	Uttar Pradesh	1,852,071	255,951	128,303	930,580	286,464	211,463	75,001	3,453,369
10	Bihar	1,005,605	130,471	73,970	512,246	165,319	145,153	20,166	1,887,611
11	Sikkim	10,790	3,174	3,432	2,172	799	715	84	20,367
12	Arunachal Pradesh	23,079	2,429	3,072	3,474	1,261	1,068	193	33,315
13	Nagaland	9,968	4,398	5,245	4,258	2,630	2,330	300	26,499
14	Manipur	11,713	2,769	2,994	6,177	4,723	3,190	1,533	28,376
15	Mizoram	6,257	2,006	2,421	2,476	2,851	1,655	1,196	16,011
16	Tripura	27,505	5,105	5,699	13,970	6,661	5,470	1,191	58,940
17	Meghalaya	13,381	3,431	3,668	5,127	3,196	2,604	592	28,803
18	Assam	282,056	56,974	51,825	91,970	47,475	41,309	6,166	530,300
19	West Bengal	862,073	170,022	131,579	412,658	270,842	181,981	88,861	1,847,174
20	Jharkhand	186,216	39,683	28,233	138,323	55,922	41,442	14,480	448,377
21	Orissa	514,104	68,673	84,115	250,851	103,592	87,319	16,273	1,021,335
22	Chhattisgarh	160,131	30,438	34,093	151,611	43,614	34,301	9,313	419,887
23	Gujarat	494,624	66,534	70,321	310,765	103,221	65,433	37,788	1,045,465
24	Daman & Diu	1,898	189	120	690	274	138	136	3,171
25	Dadra & Nagar Haveli	2,346	295	337	795	275	222	53	4,048
26	Maharashtra	580,930	113,043	92,390	569,945	213,274	124,748	88,526	1,569,582
27	Madhya Pradesh	636,214	75,825	85,354	495,878	115,257	78,280	36,977	1,408,528
28	Andhra Pradesh	581,587	138,974	73,373	415,848	155,199	116,909	38,290	1,364,981
29	Karnataka	440,875	90,717	49,861	266,559	92,631	62,325	30,306	940,643
30	Goa	4,393	1,868	1,000	4,910	3,578	1,972	1,606	15,749
31	Lakshadweep	603	207	147	505	216	126	90	1,678
32	Kerala	334,622	67,066	79,713	237,707	141,686	105,842	35,844	860,794
33	Tamil Nadu	964,063	124,479	72,636	353,798	127,521	67,483	60,038	1,642,497
34	Pondicherry	10,646	1,818	2,277	8,830	2,286	736	1,550	25,857
35	Andman & Nicobar	3,321	652	545	1,870	669	497	172	7,057
36	India		21,906,769						

TABLE NO. 2: DISTRIBUTION OF TOTAL POPULATION, DISABLED POPULATION AND PERCENTAGE OF DISABLED POPULATION TO TOTAL POPULATION BY RESIDENCE AND SEX FOR INDIA

Particulars	Males	Females	Total
Total Population	**532156772**	**496453556**	**1028610328**
Rural	381602674	360887965	742490639
Urban	150554098	135565591	286119689
Total Disabled Population	**12605635**	**9301134**	**21906769**
Rural	9410185	6978197	16388382
Urban	3195450	2322937	5518387
Percentage of Disabled Population to Total Population			
Total	2.37	1.87	2.13
Rural	2.47	1.93	2.21
Urban	2.12	1.71	1.93

TABLE NO. 3: SEX-WISE, LOCATION-WISE AND DISABILITY TYPE OF TOTAL DISABLED POPULATION IN INDIA

Type of Disability	Rural		Urban		Total	
	Males	Females	Males	Females	Males	Females
Seeing (Visually) impaired	4222717	3650666	1509621	1251877	5732338	4902543
Speech Impaired	713966	529888	228129	168885	942095	698773
Hearing impaired	549002	473814	124795	114111	673797	587925
Orthopedically disabled	2975127	1679425	927625	523300	3902752	2202725
Mentally disabled	949373	644404	405280	264764	1354653	909168
Total	9410185	6978197	3195450	2322937	12605635	9301134

REHABILITATION OF THE DISABLED

The disabled persons have an equal right to participate in social and economic activities like the rest of the community. The Central and State Governments express concern regarding the needs of the disabled through various policies and programmes. There is a need to examine the relevance and efficacy of these measures (Vaswani, 1997). On rehabilitation of the disabled people, Visvesaran (1997) stated that the attitudes of people towards the physically handicapped and mentally retarded are changing. They are no more isolated and looked upon as outcasts but are accepted as a social responsibility and efforts by various voluntary organizations and the Government are being made to make them feel very much a part of the community. It has been rightly said that emphasis should be placed on what a handicapped person has, not on what he does not have. Therefore, parents and the public are being educated on how to deal with the handicapped and help them advance towards a fuller life. The steps to rehabilitate the disabled people were done by both central as well as different state government as under.

1. PROMOTION OF VOLUNTARY SERVICES

Earlier, the services delivery for the disabled was concentrated in the voluntary sector. Social welfare services, especially in the fields of medicine and rehabilitation were undertaken by missionary activists as a part of their general programmes of social and economic development. As a result, a large number of societies in the non-governmental sectors were established, depending mainly on public support and donations, who would look after the sick and the infirm, the destitute and the disabled. In recent years these services have gained importance and government has stepped in to a make these services standardized, professional and at par with such services offered all over the world. The government has since independence been focusing attention on the prevention of disabilities, provision of physical restorative services, development of personnel and resource persons through the training of professionals, development of services through research and field trails and social and economic measures such as executive orders and enactments to ensure just distribution of the fruits of development to the handicapped population. There are over 1000 voluntary organizations in India working in the field of welfare of the handicapped. Out of these about 350 receive grants from the Government of India. The state governments have their own schemes of financial assistance to NGOs.

2. GRANTS TO NON-GOVERNMENTAL ORGANIZATIONS (NGOs)

The Ministry of Social Justice and Empowerment has two major schemes for giving grants-in-aid to Non-Governmental Organizations and voluntary organizations. These are the schemes of assistance under which grants are given for recurring and non- recurring expenditure up to 90 per cent of the budget of the grantee organization. The grantee organization is expected to meet the balance of 10 per cent by raising its own resources. Assistance is given under this scheme for developing services for the disabled for the prevention of disability, special education and vocational training, training of resource persons, provision of therapeutic services such as physical therapy and occupational therapy, placement services, etc. Grants are also given for the construction of buildings and purchase of equipments.

The second major scheme under which grants are given to NGOs and voluntary organisations is the scheme of assistance to disabled persons for purchase and fitting of artificial aids and appliances. Under this scheme, needy physically handicapped persons are assisted in procuring durable and sophisticated standard aids and appliances to promote their physical, social and psychological rehabilitation. Aids and appliances are given to all categories of disabled persons. These include orthotic and prosthetic aids for the orthopaedically handicapped, hearing aids for the hearing handicapped and educational kits such as Braille slates and Braille measuring devices. Braille writers and tape-records for the visually handicapped and carder seats and prone boards for the spastics. Tricycles and wheel chairs and orthopaedic shoes are also provided in deserving cases to physically handicapped persons. The aids and appliances are given free of cost to those persons whose income is upto Rs. 1200 per month and at 50% of the cost to those whose income is between Rs. 1201 to Rs. 2500. Aids and appliances costing between Rs. 25 to Rs. 3600 are covered under this scheme (Sachdeva, 2006).

3. ESTABLISHMENT OF NATIONAL INSTITUTES FOR THE DISABLED

There are four National Institutes in each major area of disability under the Ministry of Social Justice and Empowerment. They are: the National Institute for the Orthopaedically handicapped at Kolkata, the National Institute for the Visually Handicapped at Dehradun, the National Institute for the Mentally Handicapped at Secunderabad, and the Ali Yavar Jung National Institute for the Hearing Handicapped at Mumbai. These institutes have been designated as apex organisations for training of professionals, production of education materials and other aids for the handicapped, conducting research in rehabilitation and development of suitable model services for the handicapped. These institutes work in coordination with each other and other training centres in the country, leading voluntary organizations, state governments as well as international agencies to enforce standards in various institutions of the handicapped and standardization of training programmes. The activities of these institutes are stated as under.

1. SHYAMA PRASAD MUKHERJEE NATIONAL INSTITUTE FOR THE ORTHOPEDICALLY HANDICAPPED (NIOH), KOLKATA

N1OH established in 1978 at Kolkata is an autonomous Institution under the Ministry of Social Justice and Empowerment, Govt. of India, being the apex level organization in the country for the welfare of locomotor disabled persons, its main aim is to provide comprehensive rehabilitation to them. It offers treatment to both inpatients and outpatients and conducts research and training in the area of rehabilitation. The services and facilities of the institute include, training, research, facilitating aids and appliances to orthopedically handicapped people.

2. NATIONAL INSTITUTE FOR THE MENTALLY HANDICAPPED (NIMH), SECUNDERABAD

The National Institute for the Mentally Handicapped (NIMH) was set up at Secunderabad in 1984 as an autonomous body under the then Ministry of Welfare, Government of India. As an apex body, it is committed to develop models of care for the mentally handicapped persons, conduct research in the area of mental handicap, and promote human resource development to work with mentally handicapped persons in the country. Its main objectives are : (a) to develop appropriate models of care and rehabilitation for the mentally retarded persons appropriate to Indian conditions; (b) to develop manpower for delivery of services to the mentally handicapped; (c) to identify, conduct and coordinate research in the area of mental retardation, (d) to provide consultancy services to voluntary organizations in the area of mental handicap and to assist them whenever necessary; (e) to serve as a documentation and information centre in the area of mental retardation; and (f) to acquire relevant data to assess the magnitude, causes, rural-urban composition, socio-economic factors, etc. of mental retardation in the country. Specialists from different fields work at NIMH as a team to help achieve these goals and provide succour to the mentally handicapped. Assessment and management is individual based and well chalked out steps are taken during the intervention period. The highlight of the intervention programme is that it is home based. Parents who play key role are trained to manage the children in their natural environment. Its services and facilities include special education through day care centre to mentally handicapped children. It also provides guidance and counseling to the parents of the mentally handicapped children. The research and extension is also conducted in the institute. One of the highlighting services of this institute is that it train and develop the mentally handicapped children in minor jobs and promote the employment for such children. Besides these activities the institute publishes newsletters, organizes the workshops, conferences, seminars, etc to the mentally handicapped people.

3. NATIONAL INSTITUTE FOR THE VISUALLY HANDICAPPED, DEHRADUN (NIVH)

The National Institute for the Visually Handicapped, Dehradun is the apex body in the field of welfare of the blind. The Institute commenced working as Training Centre for the Blind on January 1, 1950 under the Union Ministry of Education. Other units were added to it later on. They all were brought under a single administration in 1967 bringing National Centre for the Blind into existence. The Institute today has extremely broad-based functions and responsibilities aimed at opening up new vistas of opportunities for the visually handicapped in different spheres. The Institute's role, at present comprises : organizing meaningful and need-based programmes at personnel training; undertaking and coordination research and development activities; running model services for the blind; collection and dissemination of information on work for the blind; preparing material for parent/employer/ community education; manufacturing of aids and appliances; producing books in Braille and cassettes. Like other institutes it also promotes the research and extension activities, training, etc. A revolutionary step initiated by the Institute has been its exercise to explore the possibility of providing computer training to the visually handicapped. For this purpose, the Institute has designed suitable syllabi and developed at appropriate interface in collaboration with a reputed agency in Mumbai to give out tactile/audio output on different PCs. It has also identified specific computer based jobs/operations which could be taken up by the blind in private and public sectors.

4. ALI YAVAR JUNG NATIONAL INSTITUTE FOR THE HEARING HANDICAPPED (AYJNIHH), MUMBAI

Rehabilitation programmes for the hearing handicapped was started with the establishment of the Ali Yavar Jung National Institute for the Hearing Handicapped on 9th August, 1983 at Bombay. It was named in honour of the former Governor of Maharashtra, the Late Shri Ali Yavar Jung, who was instrumental in its establishment. The institute is the focal point for activities encompassing all aspects of rehabilitation of the hearing handicapped under the administrative control of the Ministry of Social Justice| and Empowerment, Government of India. Its activities are shown as under.

The National Sample Survey of India (1981) indicated that there are approximately 3.02 million persons with hearing impairment, of this 0.78 million are children who need specialized help for their education. Approximately, 54,000 trained teachers are needed to cover this group as compared to the 3,000 currently available. Thus, it may be seen that the number of trained professionals is woefully inadequate. With a view to bridge this wide gap, the institute has taken as one of its main objectives, the generation of trained manpower at various levels.

AYJNIHH, Mumbai and its regional centres at Kolkata, Delhi, Hyderabad. Bhubaneshwar and Valakom offer two Diploma courses in rehabilitation of die deaf. In addition to this, AYJNIHH, Mumbai conducts two degree courses, i.e., B.Sc. in Audiology and Speech Therapy and B.Ed, (deaf) (Special Education for the Deaf). These degree courses have been accorded recognition by the University of Bombay. About 25 students enroll every year for each course. Provision is made for reservation of seats for various states to ensure wide representation of the trained personnel. Apart from these, many short term training programmes are conducted to acquaint allied professionals and to update professionals in this field on various aspects of hearing impairment. They include : (i) Custom ear mould making and hearing aid repairs; (ii) Refresher courses for speech and hearing professionals; (m) Orientation programmes for ENT specialists, General Medical Practitioners; psychologists, social workers, regular teachers and other allied professionals; and (iv) Refresher courses for speech and hearing professionals; (v) Workshop symposia and seminars for professionals and parents. It also promotes research and extension services which are funded by UNICEF. It has also regional centres which offer clinical, therapeutic and educational services to the hearing handicapped. It provides services to a large number of hearing handicapped adults in different areas such as : Counselling, Career guidance, Training, Job placement, Self-employment, Scholarship, Pension, Referral. The Institute is constantly exploring new avenues of employment, especially self-employment opportunities suitable to the hearing handicapped. To achieve this, workshops, discussions and seminars are held regularly Employers and prospective employers are also involved in these programmes so as to foster mutual understanding and co-operation. Professionals like vocational counsellors, placement officers, employment officers and social workers are annually trained in the effective management of socio-economic rehabilitation. Training of the adult deaf in various trades is conducted both at Mumbai and Hydrabad. The Training Centre for the Adult Deaf at Hyderabad offers vocational training in seven trades which are at par with special ITI level. At AYJNIHH, training in "Welding" at ITI level under the apprenticeship Act, has been initiated for the first time in India.

The above institutes are specialized in providing services in specific kinds of disabilities. Apart from these institutes, various composite institutes, schemes, programmes and projects to serve all the kinds of disabled people were also set up and functioning by the Ministry of Social Justice and Empowerment and the major schemes of these institutes include Indian Spinal Injury Centre, New Delhi, District Disability Rehabilitation Centres (DDRCs), Artificial Limbs Manufactoring Corporation of India (ALIMCO), Kanpur, National Handicapped Finance and Development Corporation (NHFDC), National Trust for the Welfare of Persons with Autism, Cerebral Palsy,-Mental Retardation and Multiple Disabilities, Rehabilitation Council of India, District Rehabilitation Centre (DRC) Scheme, Science and Technology Projects in Mission Mode, UNDP Funded Project Support to Children with Disabilities, etc.

CONCLUDING REMARKS

Disabled persons especially children in India are the most vulnerable group. Unfortunately, disabled persons irrespective of their economic status are subjected to social exclusion in the society. Economic, psychological and social confidence building is therefore immediately necessary. Services and welfare programmes for the disabled, to some extent will relieve the pain of being dependent.

It is the society, which has to be blamed for the alienation of the disabled in the society. Hence, there is need to create awareness among the people, so that there should be increase in sympathy and assistance from the society to the disabled for satisfactory living. Society have to love the disabled, show affection to them, provide assistance them and increase self-confidence and motivate the disabled to perform and work like normal people. This is of immense values to the disabled children, which strengthens and encourage the disabled to work like common people by forgetting that they are disabled in one or other ways.

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USE OF E-JOURNALS IN THE DISCIPLINES OF LIFE SCIENCE IN K.U.K: AN ANALYTICAL STUDY

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ABSTRACT

The present study has been undertaken to assess the Use of E-Journals in the disciplines of life science in K.U.K. A well structured questionnaire was distributed among the research-scholars and teachers of six departments viz Botany, Zoology, Microbiology, Bio-chemistry, Bio- technology, & Environment science under Life Science in K.U.K. The responses were gathered from 77 users (35 teachers, 42 research scholars). The findings of the survey reveal useful facts about E-Journals. 89.24% of the respondents were aware of E-journals. 81% of the respondents read the printouts of e-journals. On the basis of the findings, it was suggested that in order to improve the library network speed and library should organize training programmes for the upcoming information professionals.

KEYWORDS

E-Journals, Kurukshetra University, life science E-Journals, Journal, University libraries, User studies, Use.

INTRODUCTION

E-journals have become an important tool for scientists, research scholars and faculty members over the last few years. E-journals and journals article databases now form a large part of periodical collection of university libraries. E-journals are also available from other sources, including subject repositories, institutional repositories, author wed sited, and open access journals. Scholars, who are affiliated with universities that have substantial electronic collections and internet infrastructure, have the potential to access more journals and scholarly articles than ever before. This unprecedented access is true in many nations with developed infrastructure, but little is known about how reading patterns may differ among academics in different nations.

CONCEPT OF E- JOURNALS

E- Journals mean that they are originally published only in electronic format.

Electronic journals are defined as the electronic version, usually published on the web, of a print journal or an electronic journal (published on the web) which has no print equivalent. (Hawkins)

REVIEW OF LITERATURE

McClamroch (2011) examined the factors that were considered by college and university libraries in Indiana when making the decision to cancel subscriptions to print journals when an electronic equivalent was available. The results indicate that academic libraries in Indiana use subscription costs, the redundancy of formats, student preferences, budget reductions and usage as the primary factors in cancelling print journal subscriptions in favour of their electronic counterparts. The study indicates that subscription cost was the most important consideration in the journal cancellation process, with other factors also having an effect on the preference of libraries for electronic versions of journals.

Ali and Nisha (2011) investigated the E-journals awareness and use among the research scholars of Central Science Library, University of Delhi. The major findings of the survey reveal useful facts about the more than 60 % of users in the Central Science Library were using e-journals weekly for the purpose of research. Print journals were consulted by the majority of users as compared to e-journals. Keyword was the most popular search method for searching e-journals among research scholars, whereas the date of publication has the lowest percentage among all the options. However, it was found that slow downloading of PDF files was the major problem that would discourage users while using e-journals.

Tenopir et al. (2009) examined the factors that were considered by faculty members in science, technology, medicine and social sciences from 1977 to the present located, obtained, read, and used scholarly articles, and how that had changed with the widespread availability of electronic journals and journal alternatives. The major findings of the survey reveal useful facts about the average number of readings per year per science faculty member continue to increased, while the average time spent per reading was decreasing.

Kaur and Verma (2009) aimed to describe the use of electronic resources and services provided at the Central Library of the Indian Institute of Technology, Delhi. The major findings of the survey reveal useful facts about the usage of e-journals were increasing: this was due to awareness among users about library e-resources and services. Owing to easy access available at various places in the institute, users were accessing these resources in hostels and departments more as compared to the library. The number of users coming to library has decreased.

Kayaoglu (2008) Istanbul University faculty examined their use of E-journals. The majority of respondents supported the transition from print to e-only, particularly the facility in natural science. About 350 of the respondents reported that major barrier to use e- journals was the lack of subscription in their field.

Varghese (2008) reviewed & analyzed the results of 101 user studies conducted in the electronic environment. She stated that electronic information environment facilitates enhancement of the speed of service & number of users served, & the quantity & exhaustiveness of information provided. The way in which the people searched information to support research, teaching & creative activities was changing as new technologies & information delivery systems emerged.

Borrege & Urbano (2007) analyzed the data of consumption viz. data of session, article downloaded & abstracts viewed of 31 electronic journal of the American Chemical Society, at the University of Barcelona. Most of the consumption was concentrated at a few IP addresses, & users made little use of the information available. There was a greater dispersion of the consumption of electronic information than of information or paper. It was also determined that the number of abstracts viewed was a good predictor of the number of regular users of journals.

Karasozen & others (2007) studied the patterns of E-Journal use within the Anatolian University Library Consortium (ANKOS), which had increased rapidly the number of accessible databases & usage of e-journals. Due to the diversity of universities, differences in usage for various subject collections were observed. A comparison between the research activity in Turkey & electronic journal usage through the Anatolian University Library Consortium had been carried out. The data of the total & subject based full text article usage indicated a string correlation between the numbers of published articles differences between each institution's usages with aggregated consortium usage.

Zhixian Yi (2007) examined international student perception of information needs & whether education level, age & gender affected their information use. An e-mail survey revealed that international student needed information that supported their academic courses, & those with higher education levels used databases, remote access to library offerings, & e-journals more frequently.

Huntington et al (2006) analyzed the articles usage decay in digital environment in Ohio link the deep log analysis showed that for different kind of articles viewed, people who only viewed a table of contents page were for more likely to be current awareness "checkers", as nearly half of their views related to the current period, while those who viewed a journal issue & also went on to view an article or abstract were more likely to view older articles.

Voorbij & Ongering (2006) surveyed Dutch faculty and their use of electronic journals. It was concluded that electronic journals have become indispensable for scientists & social scientists, & a profound effect on information behavior, varying from methods of becoming aware of relevant articles to benefits on research.

Pederson & Stockdale (2005) surveyed scientists at seven universities in Great Britain, & followed up with in depth interviews of some, to assess their attitudes toward & use of e-journals. Their respondents identified a critical mass of content as well as functionalities that supported ease of searching & navigating as critical determinants in their adoption of an electronic resource.

Nicholas et al. (2005) stated that although the review of literature shows an increasing in the use of e-journals along with discreases the use of print collection more recent studies also reveal that a creasing in the use of older materials was occurring as the result of increased visibility accessibility of older material in the digital environment.

Shaffer et al. (2005) reported the results of a survey on the use of printed and electronic journals by science library users Hebrew University. At the time of study, users had already been exposed to E-journals for a number of years; most of the scientific journals were accessible in electronic format with the print format. The major findings were that more than 80% of the respondents frequently used & age, but those results indicated that by now users of all ages switched to the electronic format not only in terms of usage but of preference as well.

Liu (2005) a recent study by Liu showed that a screen based reading behavior is emerging for reading electronic documents. This behaviors is characterized by more time spent browsing & scanning, keyword spotting, one time reading, non linear reading, & reading more selectively, while less time was spent on in depth reading & concentrated reading. Annotating & highlighting while reading was a common activity in the printed environment. However, this "traditional" pattern had not yet migrated to the digital environment when people read electronic documents.

Colvin & Keene (2004) In the UK designed a project to test a hypothesis that learning can be enhanced by promoting the user of e-journals. It was conducted by the Business School at University College Worcester (UCW). Analysis of the results indicated that effective collaboration between academic & library staff, the timely embedding of e-journals into the learning process & associating them with the assessment process significantly enhance the learning of students. The data indicated an encouraging increase in journals usage for assignment research.

Kortelainen (2004) utilized the usage data of the electronic journals supplied by the Finnish National Electronic Library (FINELib) Portal to investigate the relative advantages, compatibility, complexity and visibility of e-journals and their effects on usage. The results showed that there was a clear difference between the use of the e-journals (such as Emerald journals) & article files (those services that provide journal articles in full text form, without really utilizing the advantages of digital publishing, such as EBSCO).

Tenopir et al. (2004) Conducted study at the University of Tennessee Health Science Center which showed that the medical faculty read a great deal, especially compared to scientists. The most frequently reported purpose of reading was to support their primary research which involves 30 % of reading. The majority of reading came from recent published articles & mostly from personal subscriptions. The medical faculty continued to rely on print journal (about 70% of readings) versus e-journals. Medical faculty read more articles than others & needed information digested & verified to save their time. Convenience & currency were highly valued attributes.

SCOPE OF THE STUDY

The study is being undertaken in order to identify the usability of e- journals available in kurukshetra university library in the disciplines of life science. The study will include research scholars & faculty of all the six departments viz Botany, Zoology, microbiology, Biochemistry, Biotechnology, environment Sciences following under life science.

STATEMENT OF THE PROBLEM

The cost of periodicals is increasing day by day, for this reason the libraries have to extend more money on periodicals subscription. The demand of journals especially e-journals is increasing by users, research scholars & teachers. But how much of e-journals are being used in disciplines of life science by researchers & teachers is the question to explore. So the problem under investigation is "Use of E-Journals in the disciplines of life science in K.U.K.: An analytical study."

OBJECTIVES OF THE STUDY

The objectives of the study project are:

- To establish the opinion of users with respect to the awareness & utilization of, as well as their satisfaction level with use of e-journals in the disciplines of life science.
- To find out whether the e-journals subscribed by Kurukshetra University library, kurukshetra adequately meet the needs of teachers & research scholars.
- To determine the information needs of teachers & research scholars.
- To find out the e-journals most frequently used by users.
- To know the fields of users services where improvement is required.

RESEARCH METHODOLOGY

For the purpose of the study, a questionnaire was designed (Appendix-1). The questionnaire was pre-tested before using it with the survey population. All the respondents were given the same questionnaire irrespective of their status. The questionnaire was distributed to any those respondents who willingly agreed to participate in the study. The respondents were interviewed also to fill in the gaps, if any.

ANALYSIS & DISCUSSION

TABLE 1: AWARENESS OF THE E-JOURNALS

Sr. No	Respondents	Yes No (%)	No No (%)
01	Teachers	19 (29.24)	7 (10.76)
02	Research scholars	39 (60)	-
Cumulative Total		58 (89.24)	7 (10.76)

Table 1. shows that in life science disciplines 89.24% users were aware about e-journals. 60% research scholars, 29.24% teachers are aware about e-journals. 10.76% teachers were not aware of using e-journals at all.

TABLE 2: SEX WISE E-JOURNALS USE

Sr. No	Sex	Response No (%)
01	Male	21 (36.21)
02	female	37 (63.79)
Cumulative Total		58 (100)

Table 2. shows that among E-journals users female are more 63.79% than male users which is 36.21%.

TABLE 3: STATUS WISE E-JOURNALS USE

Sr. No	Status	Response No (%)
01	Professor	3 (5.18)
02	Reader	5 (8.62)
03	Lecturer	11 (18.96)
04	Research scholars	39 (67.24)

Results in Table 3 show that use of E- Journals is more popular among research scholars and lecturers than senior faculty members. Out of total respondents 67.24% research scholars and 18.96% lecturer are use of e-journals. It is evident that e-journals are more popular among young people since research and lecturer belong to lesser age group.

TABLE 4: FREQUENCY OF USING E-JOURNALS

Sr. No	Respondents	Daily	Weekly	Bi-Weekly
01	Teachers	08 (13.79)	10 (17.24)	1 (1.72)
02	Research scholars	15 (25.86)	19 (32.76)	5 (8.62)
Cumulative Total		23 (39.65)	29 (50)	6 (10.34)

Table 4. indicates that 50% respondents use e-journals weekly. 39.65% users use e-journals use e-journals on daily basis and only 10.34% users prefer to use e-journals Bi-weekly.

TABLE 5: TIME SPENT PER ACCESS OR DOWNLOAD ONLINE ARTICLES

Sr. No	Respondent	Less than 10 Min.	10-20 Min.	20-30 Min.	30-40 Min.	40-50 Min.	More than 50
01	Teachers	1(1.72)	5(8.62)	10(17.23)	2 (3.45)	1 (1.73)	-
02	Research Scholars	3 (5.17)	12(20.69)	13 (22.42)	4 (6.89)	4 (6.89)	3 (5.17)
Cumulative Total		4 (6.89)	17(29.31)	23(39.65)	6(10.34	5 (8.62)	3 (5.17)

In life science highest 39.65% users spend 20 to 30 Min. in accessing and downloading online articles. 10 to 20 Min. time is spent in using e-journals by 29.31% users. 10.34% users access and download articles in 30 to 40 Min.

TABLE 6: FREQUENCY OF MODE USED FOR READING E-JOURNALS

Sr. No	Frequency	Always	Often	Usually	Some Times	Never
01	Read on Monitor	27 (46.55)	10 (17.24)	9 (15.51)	11 (18.96)	1 (1.72)
02	Read Print out	47 (81.03)	2 (3.44)	4 (6.89)	3 (5.17)	2 (3.44)

Though technology is available extensively for use but it seems that traditional methods are still preferred by the technology users. Table 6. Above shows it clearly that most of the e-journals users prefer to always use them in print form i.e. 81.03% users while less than i.e. 46.55% read them on monitor.

TABLE 7: SATISFACTION WITH AVAILABLE E-JOURNALS

Sr. No	Respondents	Great Extent	Some extent	satisfied	Not satisfied
01	Teachers	-	1 (1.72)	02 (3.44)	16 (27.58)
02	Research scholar	-	5 (8.62)	16 (27.58)	18 (31.04)
Cumulative Total		-	6 (10.34)	18 (31.03)	34 (58.62)

Table 7. shows that 58.62% users were not satisfied with e-journals available in their subjects. 31.03% users were just satisfied with the e-journals available in their subjects, and 10.34 users especially research scholars (8.62%) were satisfied to some extent. The reason may be because at present library is not subscribing its own e-journals which are recommended by the faculty father it is providing e-journals only available through INFONET, which might not be covering their deserved journals.

TABLE 8: PURPOSE OF USING E-JOURNALS

Sr. No	Respondents	Research Need	Education	Current Inf.	Win Award
01	Teachers	19 (32.75)	13 (22.41)	10 (17.24)	-
02	Research scholar	30 (51.73)	22 (37.93)	26 (44.82)	4 (6.89)
Cumulative Total		49 (84.48)	35 (60.34)	36 (62.06)	4 (6.89)

Most of the respondents use e-journals for more than one purpose**.** The analysis shows that main purpose of e-journals use was research need. In life science 84.48% users use e-journals for research purpose, current information is the second purpose for which users use e-journals i.e. 62.06%. Education is the third purpose for using e-journals i.e. 60.34% users. Least priority i.e. only 6.89% is given to use of e-journals for winning awards.

TABLE 9: PREFERENCE OF FORMAT OF E-JOURNALS

Sr. No	Respondents	PDF	HTML	SGML	MS Word
01	Teachers	19 (32.75)	12 (20.68)	2 (3.44)	10 (17.24)
02	Research scholar	35 (60.35)	36 (62.07)	-	25 (43.10)
Cumulative Total		54 (93.10)	48 (82.75)	2 (3.44)	35 (60.34)

The analysis in Table 9. Shows that main formats preferred for reading e-articles are PDF, HTML & MS Word. 93.10% users in life sciences prefer to use PDF format. HTML is the second preferred format i.e. by 82.75% respondents and MS Word is the third format for using e-journals i.e. by 60.34% respondents. Least priority (3.44%) is given to use the SGML format.

TABLE 10: TIME SPENT PER WEEK ON READING E-JOURNALS

Sr. No	Respondents	Online Reading			Off line Reading	
		60-90 Min.	90-120 Min.	More than 120 Min.	90-120 Min.	More than 120 Min.
01	Teachers	13 (22.41)	05 (8.62)	1 (1.72)	10 (17.24)	09 (15.51)
02	Research scholar	22 (37.93)	11(18.96)	6 (10.34)	14 (24.13)	25 (43.11)
Cumulative Total		35 (60.34)	16(27.58)	7 (12.06)	24 (41.37)	34 (58.62)

Table 10. shows that life science teachers and researchers spend more time on reading article off line than online. 60.34% respondents spend 60 to 90 Min. per week; 90 to 120 Min. spends by 27.58% users in reading e-articles online. 56.62% respondents spend more than 2 hours in reading e-articles off line and 90 to 120 Min. time is spend by 41.37% respondents.

TABLE 11: COMPONENTS OF E-JOURNALS PREFERRED

Sr. No	Respondents	Table of contents	Articles abstracts	Full text	Article References
01	Teachers	12 (20.68)	18 (31.03)	10 (17.24)	2 (3.44)
02	Research scholar	30 (51.72)	35 (60.34)	35 (60.34)	10 (17.24)
Cumulative Total		42 (72.41)	53 (91.37)	45 (77.58)	12 (20.68)

Most of the respondents use more than one component of e-journals. The analysis shown that most of the respondents i.e. 91.37% prefer to use abstracts of articles. 77.58% respondents use full articles whereas72.41% respondents use, table of contents of e-journals. Least priority i.e. 20.68% is given to use of article reference of e-journals.

TABLE 12: RANKED ORDER LIST OF E-JOURNALS PUBLISHERS

Sr. No	Name of Publishers	Yes	Percentage
01	Elsevier	42	72.41
02	Blackwell	34	58.62
03	Springer	29	50.00
04	Cambridge	27	46.55
05	Nature	26	44.82
06	Taylor & Francis	23	39.65
07	Annual Reviews	18	31.03
08	Oxford university Press	14	24.13
09	J-Stor	11	18.96
10	American Chemical Society	09	15.51
11	Emerald	03	05.17
12	Project Muse	02	03.44
13	American Physical Society	01	01.72
14	American Ins. Of Physics	-	-
15	Institute of Physics	-	-

Table 12. reveals that Elsevier and Blackwell are on the top priority of the respondents in life science 72.41% users use journals published by Elsevier & 58.62% users use publication of Blackwell.

TABLE 13: OPINION READING E-JOURNALS BEING IMPORTANT PART OF SCIENTIFIC COMMUNICATION

Sr. No	Respondents	Yes No (%)	No No (%)
01	Teachers	19 (32.75)	-
02	Research scholars	39 (67.24)	-
Cumulative Total		58 (100)	-

As per table 13. 100% users agree that the e-journals are most important part of scientific communication.

TABLE 14: SATISFIED WITH E-SERVICES PROVIDED BY THE LIBRARY

Sr. No	Respondents	Yes No (%)	No No (%)
01	Teachers	4 (6.89)	15 (25.86)
02	Research scholars	6 (10.34)	33 (56.89)
Cumulative Total		10 (17.24)	48 (82.75)

Table 14. shows that only 17.24% users are satisfied with the e-services whereas 82.75% users are not satisfied with the e-service provided by the library. The reason may be the library is not able to subscribe their desired journals.

TABLE 15: OPINION REGARDING ACCESSIBILITY AND AVAILABILITY FEATURES OF E-JOURNALS

Sr. No	Statement		Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly	Cumulative Total
01	24 Hrs Available	**T**	07(12.07)	-	-	-	17(29.31)
		R.S	10(17.24)	-	-	-	
02	Desktop Availability	T	12(20.68)	-	-	-	30(51.72)
		R.S	18(31.04)	-	-	-	
03	Free Access	T	15(25.86)	-	-	-	35 (60.34)
		R.S	20(34.48)	-	-	-	
04	Depend on Network	T	-	5(8.62)	-	-	14 (24.13)
		R.S	-	9(15.51)	-	-	
05	Needs Special Equipment	T	-	2(3.45)	-	-	08 (13.79)
		R.S	-	6(10.34)	-	-	
06	Require Training	T	-	-	5(8.62)	-	13 (22.41)
		R.S	-	-	8(13.79)	-	

T= Teachers

R. S= Research Scholars

Table 15. reveals the respondents opinion regarding various features of E-Journals. Most of the respondents strongly agree with the free accessibility (60.34%), desktop availability (51.72%) and 24 Hrs. availability (29.31%) features of E-Journals. The reason of less response of 24 Hrs. available may be because the library provide access only upto 5:00 PM & 24 Hrs. The respondents agree somewhat with the network dependent (24.13%) and need of special equipment (13.79%). A very less portion of the respondents (22.41%) disagree somewhat that using E-Journals require training. This means that the library should arrange to provide some training in searching and using the E-Journals.

TABLE 15: OPINION REGARDING GENERAL FEATURES OF E-JOURNALS

Sr. No	Statement		Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly	Cumulative Total
01	Up to data Information	**T**	15(25.86)	-	-	-	47 (81.03)
		R.S	32(55.17)	-	-	-	
02	Search Capabilities	T	14(24.13)	-	-	-	46 (79.31)
		R.S	32(55.17)	-	-	-	
03	full Text Retrieval	T	08(13.79)	-	-	-	20 (34.48)
		R.S	12(20.68)	-	-	-	
04	Retrieval Possibilities	T	-	07(12.6)	-	-	17 (29.31)
		R.S	-	10(17.24)	-	-	
05	Hypertext Links	T	-	-	06(10.34)	-	21 (36.20)
		R.S	-	-	15(25.86)	-	
06	Link to Related items	T	-	-	-	01(1.72)	04 (6.89)
		R.S	-	-	-	03(5.17)	

Respondents strongly agreed and gave priority to the features viz upto date information by 81.03% respondents, search capability by 79.31% and full text retrieval by 34.48% respondents. It was surprising to see that hyperlink and link to related items features could not attract alteration of the respondents.

FINDING OF THE SURVEY

- Most of the respondents i.e. 89.24% users were aware of the E-journals in life science.
- In life science disciplines in K.U.K. E-Journals were used more by females i.e. by 63.79% than male users.
- E-Journals were used more by research scholars 67.24% and lecturers 18.96% than the senior faculty members.
- 50% users preferred to use E-Journals weekly and 39.65% used them daily.
- More users 20 to 30 Min. in accessing or download online article i.e. 39.65% and 29.31% spend 10-20 Min. in accessing E-Journals.
- Mostly users preferred to always to read the print out of the E-Journals i.e. respondents by 81.03% users than reading if on computer monitor which is preferred by 46.55% users.
- 58.62% users were not satisfied with the E-Journals available in their subjects in the K.U.K library.
- Main purpose of using E-Journals by life science respondents were for fulfilling research needs educational and obtaining current information in their respective disciplines.
- 93.10% users liked to use E-Journals in PDF Format, 82.75% in HTML and 60.34% in MS Word format.
- Most of the life scientists i.e. 60.34% spend 60 to 90 Min. per week in reading E-Journals, online whereas 58.62% users spend more than 20Hrs. per week, reading articles offline after downloading articles.
- Almost 100% users i.e. 91.37% preferred to use articles abstracts & 77.58% preferred full articles and 72.41% used only table of contents.
- 72.41% users used journals published by Elsevier and 58.62% used Blackwell publishers.
- 100% users agreed upon the fact E-Journals are most important part of scientific communication.
- More than 82.75% users were not satisfied with the e-service provide by the library.
- The features like free access 60.34%, desktop availability 51.72% and 24 Hrs. availability 29.31% of E-Journals fascinated the users more than other features.
- Among the general features of E-Journals providing up to date information 81.03% and search capabilities strongly appealed to the respondents.

SUGGESTIONS

Based on the findings, the following suggestions are put forward to improve the use of E-Journals.

- The result of the study concluded that 24 hours free access to electronic journals at the user's desktop lead to increased acceptance.
- Improve the library network speed.
- All the journals of "Science Direct" should be made available for users in K.U.K.
- Availability of network on Saturdays evening hours and holidays is very poor. It should be improved.
- The library network with the available of significant number of electronic journals at the Kurukshetra University, Kurukshetra has been successful.
- Library should organize training programme for the information professionals so that they can know about different search interface, latest changes of the journals site and develop sophisticated searching and retrieval skills or techniques.

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APPENDIX

QUESTIONNAIRE FOR USERS

Personal information
Name: _____
Academic Qualifications: _____
Department: _____
Subject/Area of Specialization_____
Sex: Female/Male
Status: (tick one): Professor/Reader/Lecturer/Research scholar

1. Are you aware of the availability of E-Journals in K.U.K.? Yes/ No

2. Do you use E-Journals? Yes/ No

If yes, please indicate your preference for publisher(s) (Tick as many applicable). If the publisher(s) is/are not included below please mention it.

American Chemical Society	J-Stor
AIP (American Ins of Physics)	Mc Uni. Press (Emerald)
APS (American Physical Society)	Nature
Annual Reviews	Oxford University Press
Blackwell Publishing	Project Muse
Cambridge University Press	Springer- link
Elsevier (Ins. Academic Press)	Taylor & Francis, Ltd.
Institute of Physics	
Any other	

3. Please list the titles (Preference wise) of electronic journals that you use:
1. _____
2. _____
3. _____
4. _____

4. Please mention the purpose and extent to which you use electronic journals?

Purpose of Use	Always	Often	Usually	Sometimes	Never
Research needs					
Education					
Current Information					
Win Award					

5. Which formats of electronic journals do you prefer?

Type of Format	Always	Often	Usually	Sometimes	Never
PDF					
HTML					
SGML					
MS Word					
ASCII					

6. Which component(s) of electronic journals do you Use?

Component of Online Journals	Always	Often	Usually	Sometimes	Never
Table of Contents					
Journals Abstracts					
Full Text					
Article References					
Alerting Services					

7. On average how often do you access e-journals?
a) Daily
b) Weekly
c) Biweekly
d) Monthly
e) Bimonthly

8. On average how long does it take to access or download online articles?

a) Less than 10 Min.
b) 10-20 Min.
c) 20-30 min.
d) 30-40 min.
e) 40-50 min
f) More than 50 Min.

9. On average how much time do you spend weekly on reading e-journals?
(Please tick appropriate option).

Online Reading		Off Line Reading	
Up to 30 Minutes		Up to 30 Minutes	
30-60 Min.		30-60 Min.	
60-90 Min		60-90 Min	
90-120 Min.		90-120 Min.	
More than 120 Min.		More than 120 Min.	

10. How many articles (in electronic form) do you read in a week?

a) Less than 5 c) 10-15
b) 5-10 d) More than 15

11. How do you read e-journals?

Mode	Always	Often	Usually	Sometimes	Never
Read on a monitor					
Read Print out					

12. Please indicate how strongly you agree or disagree with the following statements about the ***accessibility and availability*** of electronic journals. (Tick as many as applicable)

ACCESSIBILITY AND AVAILABILITY				
Statement	**Agree Strongly**	**Agree Somewhat**	**Disagree Somewhat**	**Disagree Strongly**
24 Hrs Available				
Desktop Availability				
Free access				
Depend on network				
Needs Special Equipment				
Require Training				

13. The following statements are about journals ***general features***. Please indicate how strongly you agree or disagree with each statement.

General features				
Statement	**Agree Strongly**	**Agree Somewhat**	**Disagree Somewhat**	**Disagree Strongly**
Up to Date Information				
Search Capabilities				
Full Text Retrieval				
Retrieval Possibilities				
Hypertext Links				
Link to related items				
Connect People				

14. Do you agree with this statement electronic journals are one of the most important part of scientific communication?
Yes/ No

15. How are you satisfied with the e-journals available/subscribed in your subject(s) in K.U.K.

a) To great extent
b) To some extent
c) Satisfied
d) Not satisfied

16. If not satisfied have you ever suggested to subscribe/reverse subscription of any e-journals and how far library met your requirement?
Yes/ No

17. Are you satisfied with the e-services provided by the library? Yes/ No

18. If you have any suggestion(s) to make for improvement of e-journals subscription/e-services of the library. Please mention in a few lines.

_____

Signature

Thanks for your cooperation

ISLAMIC MICROFINANCE-FINANCING THE POOREST OF THE POOR

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ABSTRACT

Making poor bankable is the shortest definition of microfinance. Microfinance (MF) is a powerful poverty alleviation tool. It implies provision of financial services to poor and low-income people whose low economic standing excludes them from formal financial systems. Access to services such as, credit, venture capital, savings, insurance, remittance is provided on a micro-scale enabling participation of those with severely limited financial means. The provision of financial services to the poor helps to increase household income and economic security, build assets and reduce vulnerability; creates demand for other goods and services (especially nutrition, education, and health care); and stimulates local economies..The main aim of the paper is to assess the potentials of Islamic financing schemes for micro financing purposes. The paper argues that Islamic finance has an important role for furthering socio-economic development of the poor and small (micro) entrepreneurs without charging interest (read: riba'). Furthermore, Islamic financing schemes have moral and ethical attributes that can effectively motivate micro entrepreneurs to thrive. The paper also argues that there is a nexus between Islamic banking and microfinance as many elements of microfinance could be considered consistent with the broader goals of Islamic banking. The paper, first, introduces the concepts of microfinance, and presents a case for Islamic microfinance to become one of the components of Islamic banking. The paper then discusses, the potentials of various Islamic financing schemes that can be advanced and adapted for microfinance purposes including techniques to mitigate the inherent risks.

KEYWORDS

gharrar, ijara, mudaraba, murabaha, musharaka, riba.

INTRODUCTION

CGAP (consultative group to assist the poor, UN millennium development goals) has come up with eleven key principles of MF based on decade-long consultations with its members and stakeholders. These are as follows:

1. Poor people need a variety of financial services, not just loans. In addition to credit, they want savings, insurance, and money transfer services.
2. Microfinance is about building permanent local financial institutions that can attract domestic deposits, recycle them into loans, and provide other financial services
3. Donor funds should complement private capital, not compete with it. Donor subsides should be temporary start-up support designed to get an institution to the point where it can tap private funding sources, such as deposits.
4. Microfinance is a powerful tool to fight poverty. Poor households use financial services to raise income, build their assets, and cushion themselves against external shocks.
5. . The job of government is to enable financial services, not to provide them directly. Governments can almost never do a good job of lending, but they can set a supporting policy environment.
6. Microfinance works best when it measures—and discloses—its performance. Reporting not only helps stakeholders judge costs and benefits, but it also improves performance. MFIs need to produce accurate and comparable reporting on financial performance (e.g., loan repayment and cost recovery) as well as social performance (e.g., number and poverty level of clients being served).
7. Interest rate ceilings hurt poor people by making it harder for them to get credit. Making many small loans costs more than making a few large ones. Interest rate ceilings prevent microfinance institutions from covering their costs, and thereby choke off the supply of credit for poor people
8. Microfinance means building financial systems that serve the poor. Microfinance will reach its full potential only if it is integrated into a country's mainstream financial system.
9. Microfinance can pay for itself, and must do so if it is to reach very large numbers of poor people. Unless microfinance providers charge enough to cover their costs, they will always be limited by the scarce and uncertain supply of subsidies from governments and donors.
10. Microcredit is not always the answer. Other kinds of support may work better for people who are so destitute that they are without income or means of repayment.
11. The key bottleneck is the shortage of strong institutions and managers. Donors should focus their support on building capacity.

Microfinance and Islamic finance have much in common. Islam emphasizes ethical, moral, social, and religious factors to promote equality and fairness for the good of society as a whole. Principles encouraging risk sharing, individual rights and duties, property rights, and the sanctity of contracts are all part of the Islamic code underlying the financial system. In this light, many elements of microfinance are consistent with the broader goals of Islamic finance. Both advocate entrepreneurship and risk sharing and believe that the poor should take part in such activities. Both focus on developmental and social goals. Both advocate financial inclusion, entrepreneurship and risk-sharing through partnership finance. Both involve participation by the poor. There are however, some points of difference, discomfort and discontentment. Conventional microfinance is not for the poorest of the poor. There is a sizeable substratum within the rural poor whose lives are unlikely to be touched, let alone improved by financial services. They are not "bankable" in their own or their neighbour's eyes, even when the bank is exclusively for poor people. Yet they desperately need some sort of assistance. An Islamic microfinance system, on the other hand, identifies being the poorest of the poor as the primary criterion of eligibility for receiving *zakah*. It is geared towards eliminating abject poverty through its institutions based on *zakah* and *sadaqah*. Most conventional microfinance providers charge rates of interest that are found to be high when benchmarked against mainstream banking rates. Several reasons are usually given in defense. First, returns on investment in micro-enterprise are very high, by the standards of banks and other investors – the reason being the miniscule size of investments compared to the earnings numbers. Hence, entrepreneurs can "afford" to pay high interest rates as cost of funds as long as the same are lower than rates of return. And those interest rates are much less important to micro-enterprises than access, timeliness and flexibility. Second, interest rates on microfinance are pegged relatively higher, since they entail higher administrative charges, monitoring costs and are by definition, riskier than a traditional financing portfolio.

There is indeed a general agreement on the issue that administrative and monitoring costs are higher with micro-financing. While this helps explain the differential in cost of financing of an MF portfolio as compared to a traditional portfolio, the method of financing need not be interest-based. It is commonly believed that rates of returns on micro-projects tend to be very high. However, the same is true only for the "successful" projects passing through "good times" and not true of all projects at all times. Interest related liability can compound and accentuate the financial problems of a project experiencing bad times and hasten its failure. The pace, frequency and intensity of such failure is directly related to the levels of interest rates. In case of Islamic profit-sharing mechanisms on the other hand, there is a clear alignment between profitability of the project and cost of capital. The latter rises and falls in line with the realized profits of the venture. In case of Islamic debt financing too, the negative effects of financial risk arising out of use of fixed-rate financing are limited as compared to interest-based debt. This is because the former does not allow for compounding of the debt in case of possible default. Interest rate – high or low, is rejected by

large sections of the Muslim societies as tantamount to *riba* – something that is prohibited in no uncertain terms by the Islamic Shariah. One of the potential benefits of microfinance in Muslim societies is the empowerment of Muslim women. While the ability of microfinance institutions to deliver financial services to rural women in gender-segregated societies is commendable, working with Muslim women is a sensitive issue that often raises accusations of meddling with social codes. Some Islamic MF institutions seek to overcome this through a shift in their focus from "women empowerment" to "family empowerment". In a few other Islamic MF programs, a culturally appropriate way has been found of empowering women through gender-segregated ownership of the financing entity and involving separate appraisal of loan applications by women who develop their own gender-sensitive products and strategies for the future. From the above, it is clear that the cultural and religious sensitivities of the Islamic world are somewhat unique and these must be given due emphasis in any attempt to build inclusive financial systems and bring the over one-billion Muslims into the fold of formal financial systems.

ISLAMIC FINANCE – INITIAL DIFFICULTIES WITH MICROFINANCE

In view of the above issues concerning Islamic Finance and the structures commonly used in microfinance, there are thus several key issues with regard to combining the two:

• **Riba on loans.** The most obvious and fundamental issue surrounds the issue of microcredit as the primary means of promoting entrepreneurship and reducing poverty. Interest cannot be charged, thus seeming to remove the possibility of deploying anything other than charitable donations; the sustainable social business model does not seem to apply here.

• **Riba on savings.** Again, riba cannot be applied to savings. This is not as fundamental an issue as that faced by microcredit, but aside from the issue of storing savings in a secure place, it does remove one of the key incentives to save in an environment where conventional saving is often not very well rooted.

• **Insurance.** The conventional insurance model takes a premium from the client in the hope of making a profit. In other words, it is speculating that the revenue accumulated will exceed the payouts required. This aspect of speculation is seen as maysir, or gambling, and is haram. Furthermore, the fact that the client is paying a premium, but may receive nothing in return, amounts to gharar, as the outcome is unclear.

Given these significant obstacles, how can practitioners of Islamic Finance arrive at a solution?

Islamic Finance – alternative solutions via existing instruments

A) LEGAL TOOLS

The legal tools required to operate within Islamic Finance are similar to those used in Western law, but are nevertheless critical in terms of their different applications.

Wa'd (promise)

Wa'd is the promise to carry out (or not carry out) certain actions in the future. Opinions are divided within the Islamic world as to whether it is legally binding or simply the sign of noble intentions. However, assuming no force majeure, the general consensus, as represented by the Islamic Fiqh Academy, is that some sort of penalty should be enforceable for failure to fulfil its terms. One potential use within Islamic microfinance would be for those given positions of authority within the local microcredit infrastructure.

Aqd' (contract) An Aqd' contract must consist of two counterparties exchanging goods at an agreed price. The offer made must be matched by the agreement returned, which must be explicit.

Kafala (guarantee) Given that riba cannot be levied, or penalties charged to the benefit of the creditor, kafala, or third party liability, can sometimes be seen as unnecessary. However, in the field of microfinance, the concept of a third party guarantor is one thoroughly embedded in many of the models, and consequently relevant here.

Wakala (agency contract)

This is a concept applied in many instruments used in Islamic Finance, ranging from brokerage to the purchase of property. Individuals or organizations are able to give authority to another party to transact deals on their behalf, as with banks giving authority to loan officers or village elders.

B) SHARIAH-COMPLIANT INSTRUMENTS OF MICROFINANCE

Prohibition of riba, gharar, jahl, darar and other constraining norms in Islamic finance does not constitute an obstacle in building sound microfinance products. On the contrary, the need for Shariah compliance has led to considerable research into product development. While the conventional system provides for simple interest-based deposits, donations and loans, the Islamic financial system comprises an array of instruments for mobilization of funds, financing and for risk management.

I) INSTRUMENTS FOR MOBILIZATION OF FUNDS

Instruments for mobilization of funds may be broadly divided into (1) charity that includes zakah, sadaqah, awqaf; gifts that include hiba and tabarru; (2) deposits that may take the form of wadiah, qard al-hasan and mudarabah and (3) equity that may take the form of classical musharakah or the modern stocks.

1) While sadaqah, hiba and tabarru have parallels in conventional microfinance, such as, donations or contributions, zakah and awqaf have a special place in the Islamic system and are governed by elaborate fiqhi rules. Zakah is one of the five pillars of Islam and is meant to finance the poorest of the poor. These sections of the society are unlikely to have positive-NPV projects in need of financing and hence, are "unbankable". Awqaf creates and preserves long-term assets that generate income flows or indirectly help the process of production and creation of wealth. By targeting its benefits towards the poor, awqaf can play an important role in poverty alleviation. Though there has been significant improvement in management of zakah and awqaf in recent years, their role as vehicles of microfinance and poverty alleviation is grossly underestimated. Their growing popularity evidenced through establishment of many a zakah fund and awqaf fund is an indication of their vast potential in Muslim societies.

2) Deposits in the form of wadiah, qard al-hasan and mudarabah have their parallel in savings, current and time deposits respectively and are a regular source of funds for Islamic microfinance institutions, especially those in South-East Asia. Wadiah deposits attract gifts to compare favorably with returns available on interest-bearing deposits. Qard-based deposits do not provide any return and in some cases, involve a charge. Mudarabah deposits are based on profit-loss sharing with the depositor as rabb-al-mal and the microfinance institution as the mudarib. Available empirical evidence from Indonesia asserts that Islamic microfinance institutions have lagged far behind their conventional counterparts in raising funds through deposits. Clearly there is a need to redesign many of the deposit products by taking into account customer needs and preferences.3.2.1.3. Microfinance institutions also have the option of raising funds through participatory modes, such as, musharakah or modern equity. There is one microfinance program that has successfully demonstrated the practicality of the Islamic participatory approach of risk and profit-sharing: the village-bank-like Sanadiq program in Jabal Al Hoss, Syria. Here, villagers buy shares and become owners of the program. Financing of course is made using the murabahah methodology and dividends are distributed annually to the shareholders if profits are sufficient.

II) INSTRUMENTS OF FINANCING

Instruments of financing may be broadly divided into (1) participatory profitloss- sharing (PLS) modes, such as, mudarabah and musharakah; (2) sale-based modes, such as, murabahah; (3) lease-based modes or ijarah and (4) benevolent loans or qard with service charge.

a) Real-life experience shows that murabahah is preferred over mudarabah primarily because it eliminates the need for written records, often un available at the micro enterprise level or if available, the client may be unwilling to share them. Further, in case of murabahah a well-defined contract exists, with pre-defined amounts; a fixed contract creates a less complicated process and a lower implementation cost to the institution.

b) A microfinance program has to make several trade-offs when selecting an appropriate financing methodology based on Islamic finance principles. The program must account for the administrative costs and risks of a particular methodology not only to the program but also to borrowers. Often the choice could depend on the nature of the client. As practiced in Indonesia, clients may be broadly divided into two categories: (i) clients with existing businesses and

successful operations for at least two years. (ii) new entrepreneurs without prior business experience. The vast majority of clients are those with existing businesses and a good track record; they can be financed through such financial products as murabahah, musharakah and mudarabah, which involve some form of profitsharing. New clients without a track record are considered very risky and represent but a small minority; they can be financed through qard al-hasan, soft loans without any charge or profit-sharing. Consumer loans and loans for speculative investments, which could be ruinous to the borrower, are excluded from the range of permissible purposes of financing.

C) Unlike mainstream Islamic finance that does not quite treat qard al-hasan as a financing mechanism, Islamic microfinance has found this mechanism to be a "pure and effective" way of financing the poor. Many Islamic microfinance programs are modeled solely using qard al-hasan - both as an effective fundraising and financing mechanism. Qard al-hasan has a much stronger religious undertone than other "halal" mechanisms, being directly ordained by the holy Quran.

ISLAMIC FINANCE – SOLUTIONS TO COMMON ISSUES IN MICROFINANCE

If the answer to many of the issues surrounding Islamic microfinance can be found in the various models above, does Islamic Finance provide solutions to some of the issues plaguing microfinance as a whole? Could Islamic Finance extend microfinance in certain respects?

In discussing the issues relating to microfinance, we first mentioned the issue of high interest rates. Of course, such interest rates are not (or should not be) inflicted simply to make a healthy profit margin, but are instead symptomatic of the high costs involved in setting up and operating microcredit in developing, or even developed, nations. The fact that interest is not clearly stated as such, but is instead reflected in the mark-up in a murabaha, or in the required rate of return from a mudaraba, will not eliminate it as a cost to be borne by the consumer. However, although it would require further monitoring, the mudaraba model may at least offer a greater sense of social benefit by involving the institution in the gains and losses of the consumer.

Another area addressed was the role of subsidies within microfinance. As mentioned previously, subsidies still play a significant role within the industry. While this work does not intend to discuss whether it is morally or economically justifiable to subsidize social businesses, de Aghion and Morduch point to a theory supported among many studies of "subsidize start-up costs, not ongoing operations".18 This suggests that subsidies at least have some role to play in microfinance; consequently the substantial role played by zaqat in Islam offers an easy route, both practically and philosophically, for start-up costs at ground level among communities.

Finally, we mentioned the opposing issues of defaulting clients and overzealous enforcement. These are issues which will occur in any model along these lines, but in terms of reducing their impact, one solution may be to involve local institutions, such as mosques or tribal leaders, to ensure both consumers and representatives of the IFI behave in a proper manner. This will be covered in greater detail in subsequent sections.

Ultimately all of the above issues relating to microfinance are symptomatic of the challenges involved in working with BOP consumers, and as such are unlikely to be entirely solved by any model. However, Islamic Finance can perhaps alleviate them in some respects, while providing a solution for those consumers who feel excluded from microfinance due to their beliefs.

ISLAMIC FINANCE – PHILOSOPHICAL SIMILARITIES AND NEW SOCIAL MODELS

The models described in previous sections provide significant evidence that Islamic finance and microfinance can be compatible, at least from a technical standpoint. Standard microcredit arrangements can be mimicked by a murabaha agreement, or possibly even a mudaraba agreement; equally the leasing or purchase of property or other goods can be accomplished via an ijara agreement. Elsewhere in microfinance, we have seen that bank accounts can still be provided under an amanah or wadia contract, while the community-based solution found in a takaful contract is ideal for providing micro insurance.

The idea of responsibility to the community is one that is deeply ingrained in Islam, and thus throughout many Muslim communities. Zaqat may provide an opportunity in terms of aiding very poor communities to develop to the point where they can be helped by microfinance; it may equally provide a means to finance the start-up process for very small microfinance institutions or community groups. Another angle to this concept is the disapproval expressed within Islam of hoarding.

Let those who hoard the wealth that God has given them never think that they will benefit from it. It will bring them nothing but evil. The riches that they have hoarded will be their chains on Judgement Day. Qur'an, 3:180

As a result there is a clear need within the Islamic community for both charitable contributions and investments that include a social aspect, thus fulfilling obligations to the community as a whole. Therefore by looking beyond the technical aspects of Islamic Finance, it may be possible to envisage a social model whereby Islamic microfinance institutions are initially financed, then later underwritten by the richest members of the community, those above the BOP categories

ISLAMIC FINANCE – PROBLEMS COMPARED TO ORTHODOX MICROFINANCE

The most significant issue facing those wishing to combine Islamic Finance and microfinance is that of gender. The role of women in microfinance is seen as critical to the model laid out in the Grameen paradigm: Grameen boast of "8.1 million borrowers, 97 percent of whom are women", while various estimates place the proportion of women among all microfinance borrowers at between seventy and eighty-five percent. The most commonly proposed arguments are:

- Social pressure – the idea that women are more susceptible to the estimation of others, and are consequently more easily swayed by the concept of social collateral.
- Conservative risk profiles – several studies have indicated that women less likely to pick risky investments than men.
- Empowerment – by giving economic power to women in societies that often deny them significant authority, MFIs see better results from women as they are more likely to work hard and use funds in a more conscientious manner.
- Family units – women are more concerned by the welfare of dependants, and more likely to be working from home as they will often be looking after children and elderly relatives. Consequently they will work harder and be less mobile, thus making them easier for MFIs to monitor.

There is, of course, little in the Qur'an or the Sunnah to insist on such limited legal and political status for women. However, it remains true that in many of the states where consumers would be most interested by Islamic microfinance, women have so little independence that its efficiency might be called into question.

What is the solution to such a fundamental issue? On the face of it, this appears to be a choice between microfinance as a tool for social improvement and as a tool for improved economic performance. Should MFIs insist on only working in an environment where women are able to sign contracts, own property and run their own businesses, or should they simply aim to improve the economy of the region in which they are operating?

In fact, the choice of women as microfinance customers is critical to both aspects. As we have seen previously, women are simply the most efficient consumers of microcredit and microfinance. In the early days of microfinance in Bangladesh, Grameen faced a similar issue in terms of overcoming the reluctance of communities to allow women greater independence, as well as the freedom to meet with loan officers unsupervised. However, as the benefits of microcredit became clear, this hurdle was lifted, and the proportion of female borrowers went from fifty percent to today's ninety-seven percent. Ultimately, it will be in the interest of both MFIs and the community to improve access to financial tools for women, even if they are less willing to consider equivalent political rights.

Elsewhere, there are still significant issues relating to Islamic Finance, which, like microfinance, is still very much in its infancy. Most of all, despite the international organizations put in place, there is still very much the need for a coherent set of rules, with one governing body in place to set them. The variation in opinions between different scholars, as well as the more relaxed approach to Sharia'a laws in Malaysia compared to the Middle East, mean that there is still a degree of uncertainty with regard to the standardization of regulations. As one practitioner puts it,

"there is no one basic regulatory environment across geographies that manages Islamic banking today… I think that is one of the fundamental pieces that needs to be addressed in order for the true potential of Islamic banking to be realized".

CONCLUSION

When first looking at microfinance and Islamic Finance, it seems as if they are two models that are mutually incompatible. But by combining the techniques laid out above, we should be able to arrive at a model that is able to both accommodate the demands of Sharia'a law and serve the needs of those at the BOP. Furthermore, the emphasis placed on community is one which both models share, and which can provide a solution which will only aid one another during a time when disillusionment with conventional banking has never been more pronounced.

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USE OF CLOUD COMPUTING IN MANUFACTURING COMPANIES

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ABSTRACT

Cloud Computing is the next revolution and will have as much impact on your life as the introduction of the PC. Using websites including Facebook, Flickr and Gmail, many people already store some information out in the Internet cloud. However, within a few years most computing applications will be accessed online with the web at the heart of everything we do.Cloud computing is a type of computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications. In cloud computing, the word cloud (also phrased as "the cloud") is used as a metaphor for "the Internet," so the phrase cloud computing means "a type of Internet-based computing," where different services -- such as servers, storage and applications -- are delivered to an organization's computers and devices through the Internet.Cloud computing is a systems architecture model for Internet-based computing. It is a style of computing in which IT-related capabilities are provided "as a service", allowing users to access technology-enabled services from the Internet ("in the cloud") without knowledge of, or control over the technologies behind these servers.Cloud computing improves not only the speed, but also the quantity and quality of resources available to your organization. In this paper we have done a study to see how cloud computing affects manufacturing sector.

KEYWORDS
cloud computing, facebook, flickr, internet.

INTRODUCTION

SOFTWARE AS A SERVICE (SAAS)

SaaS comprises end-user applications delivered as a service rather than as traditional, on-premises software. The most commonly referenced example of SaaS is Salesforce.com, which provides a customer relationship management (CRM) system accessible via the Internet.

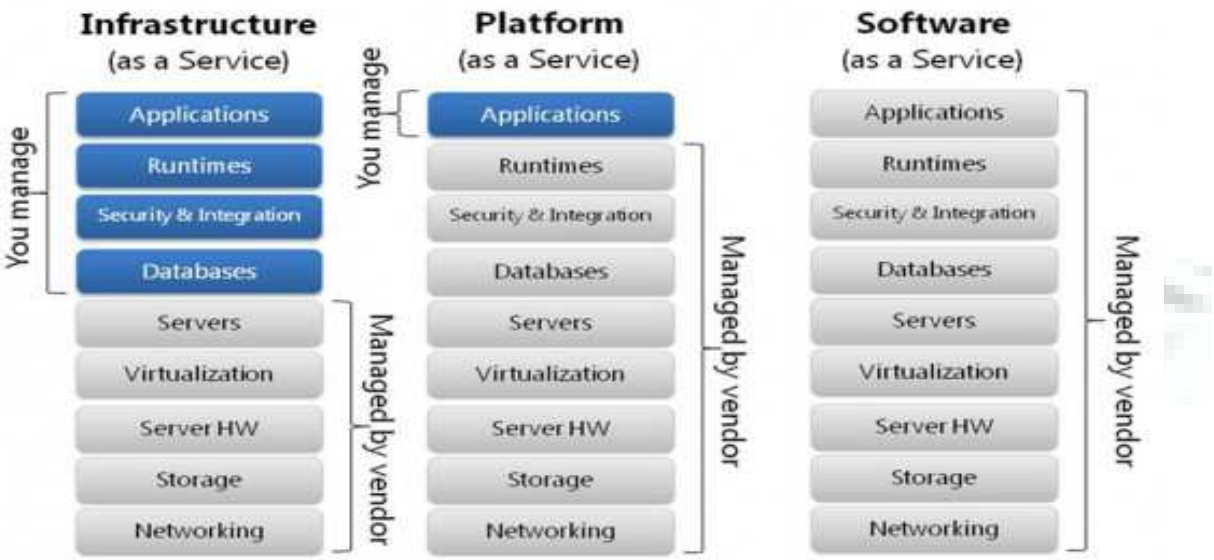
PLATFORM AS A SERVICE (PAAS)

PaaS provides an application platform, or middleware, as a service on which developers can build and deploy custom applications. Common solutions provided in this tier range from APIs and tools to database and business process management systems to security integration, allowing developers to build applications and run them on the infrastructure that the cloud vendor owns and maintains. Microsoft's Windows Azure platform services are often referenced as PaaS solutions at this middleware tier.

INFRASTRUCTURE AS A SERVICE (IAAS)

IaaS primarily encompasses the hardware and technology for computing power, storage, operating systems, or other infrastructure, delivered as off-premise, on-demand services rather than as dedicated, on-site resources such as the Amazon Elastic Compute Cloud (Amazon EC2).

CLOUD COMPUTING SERVICE MODEL



DEPLOYMENT MODELS

COMMUNITY CLOUD

A community cloud may be established where several organizations have similar requirements and seek to share infrastructure so as to realize some of the benefits of cloud computing. With the costs spread over fewer users than a public cloud, this option is more expensive but may offer a higher level of privacy, security and/or policy compliance.

Examples of community cloud include Google's "Gov Cloud".

HYBRID CLOUD

A hybrid cloud environment consists of multiple internal and/or external providers "will be typical for most enterprises". By integrating multiple cloud services, users may be able to ease the transition to public cloud services.

PRIVATE CLOUD

Private cloud and Internal cloud are expressions that some vendors have recently used to describe offerings that emulate cloud computing on private networks. These products claim to "deliver some benefits of cloud computing without the pitfalls", capitalizing on data security, corporate governance, and reliability concerns. They have been criticized on the basis that users "still have to buy, build, and manage them" and as such do not benefit from lower up-front capital costs and less hands-on management .

CRITICISM

- Cloud computing is a trap aimed at forcing more people to buy into locked, proprietary systems that would cost them more and more over time.
- The main drawback behind the concept of Cloud Computing is, companies can't completely rely on third party when they are transmitting sensitive data.

ISSUES

PRIVACY

The Cloud model has been criticized by privacy advocates for the greater ease in which the companies hosting the Cloud services control and can monitor lawfully or unlawfully, the communication and data stored between the user and the host company. Instances such as the secret NSA program, working with AT&T, and Verizon, which recorded over 10 million phone calls between American citizens, causes uncertainty among privacy advocates, and the greater powers it gives to telecommunication companies to monitor user activity.

LEGAL

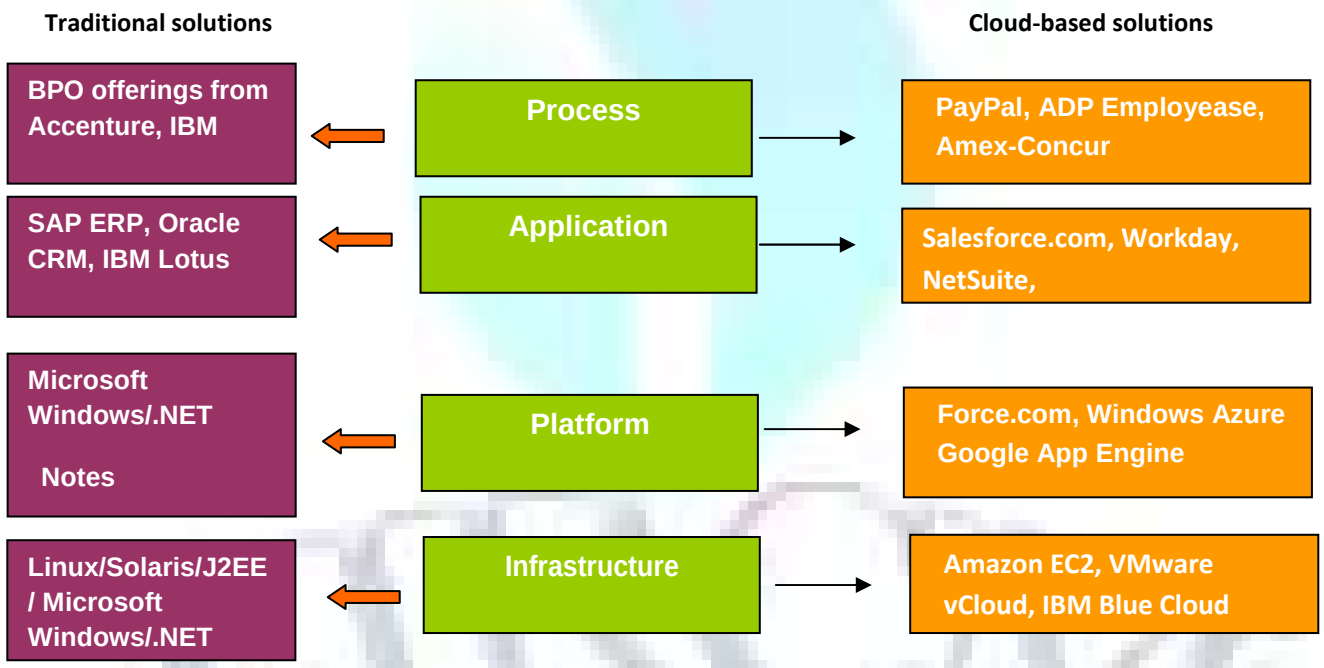
- In March 2007, Dell applied to trademark the term "cloud computing" (U.S. Trademark 77,139,082) in the United States. The "Notice of Allowance" the company received in July 2008 was cancelled in August, resulting in a formal rejection of the trademark application less than a week later.
- Since 2007, the number of trademark filings covering cloud computing brands, goods and services has increased at an almost exponential rate. As companies sought to better position themselves for cloud computing branding and marketing efforts, "cloud computing trademark filings increased by 483% between 2008 and 2009." In 2009, 116 cloud computing trademarks were filed, and trademark analysts predict that over "500 such marks could be filed during 2010."

SECURITY

The relative security of cloud computing services is a contentious issue which may be delaying its adoption. Some argue that customer data is more secure when managed internally, while others argue that cloud providers have a strong incentive to maintain trust and as such employ a higher level of security.

THE ENTERPRISE IT STACK: TRADITIONAL SOLUTIONS VERSUS CLOUD-BASED SOLUTIONS

THE ENTERPRISE IT STACK: TRADITIONAL SOLUTIONS VERSUS CLOUD-BASED SOLUTIONS



REVIEW OF LITERATURE

A study on the methods to reason and model cloud computing as a step toward identifying fundamental research questions in this paradigm. In the paper, they compare cloud computing with service computing and pervasive computing. Both the industry and research community have actively examined these three computing paradigms. They drew a qualitative comparison among them based on the classic model of computer architecture. Finally evaluated the comparison results and draw up a series of research questions in cloud computing for future exploration.[5]

Cloud computing is changing the way industries and enterprises do their businesses in that dynamically scalable and virtualized resources are provided as a service over the Internet. This model creates a brand new opportunity for enterprises. This paper highlights that Cloud computing is emerging as a major enabler for the manufacturing industry. Cloud computing technologies can be adopted in manufacturing. Cloud manufacturing is a pay-as-you-go business model. Distributed resources are encapsulated into cloud services and managed centrally.[6]

Cloud computing is a new general purpose Internet-based technology through which information is stored in servers and provided as a service and on-demand to clients. Adopting the endogenous market structures approach to macroeconomics, they analyze the economic impact of the gradual introduction of cloud computing and we emphasize its role in foster-ing business creation and competition thanks to the reduction of the fixed costs of entry in ICT capital. Their calculations based on a DSGE model show a significative impact for the European Union with the creation of a few hundred thousands new SMEs and a significant contribution to growth. Governments could enhance these benefits by subsidizing the adoption of cloud computing solutions.

IMPORTANCE OF STUDY

- The effectiveness of the operations of manufacturing companies can be analyzed.
- The problems of manufacturing organization can be studied and Effective measures can be taken as soon as possible in order to increase the efficiency of the organizations.
- The Ways of benefiting the organization by cloud computing can be studied.
- To investigate the practical issues which affect data migration in the cloud and data management system.

OBJECTIVES OF THE STUDY

1. To understand the structure and functioning of manufacturing companies.
2. To find out what are the areas of concerns of manufacturing companies.
3. To analyze what key challenges affect the operations of manufacturing companies.
4. To understand how cloud computing can help address the concerns of manufacturing companies.
5. To investigate how underused computing resources within an enterprise may be harvested and harnessed to improve return on IT investment.

RESEARCH METHODOLOGY

Type of Research: The study was exploratory in nature.

Sampling plan

- Sampling Unit : Manufacturing organization
- Sampling Size : 100
- Sampling Procedure : questionnaire method and telephonic interview
- Sampling Method : simple random sampling

DATA COLLECTION

Introspecting into the objective of the survey the questionnaire was prepared in a scientific and systematic manner. The survey was based upon primary date collection; hence both consumers and prospective consumers were surveyed.

Data is collected from this research are primary and secondary data.

Primary & Secondary Data

Primary Data: The primary data has been collected fresh and for the first time. In the research the researcher has used questionnaire method and telephonic interview to collect primary data. The respondents were given questionnaire containing twenty questions and they were asked to fill it up.

Secondary Data: The secondary data on the other hand were collected from published and unpublished materials available in New Wave like

Documents

Journals

Manual

INSTRUMENTATION TECHNIQUE

Based on descriptive research design method for achieving the objectives the study, the researcher was adopting instrument or tool for the questionnaire according to the objectives.

Software Used for the Data Analysis: Data is collected using the questionnaire and analysis the data by using the Window Excel and SPSS for analyzing the hypothesis.

RESULTS AND DISCUSSION

Table showing industry sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ICT	1	1.0	1.0	1.0
	MANUFACTURING	91	91.0	91.0	92.0
	TRADE	2	2.0	2.0	94.0
	FINANCIAL SERVICES	1	1.0	1.0	95.0
	GOVERNMENT	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

ANALYSIS

In the above pie chart 91 % respondents are from the manufacturing industry. 5% are government firms, 1% are Trading firms,1% are ICT and Financial companies .

FREQUENCIES

BQ4					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ISSUES IN HAVING CLEAR PICTURE OF INVENTORY	28	28.0	28.0	28.0
	ISSUES IN ONTIME DELIVERY	41	41.0	41.0	69.0
	ISSUES IN IDENTIFYING PENDING ORDERS	31	31.0	31.0	100.0
	Total	100	100.0	100.0	

Analysis

In the above SPSS analysis 41% of respondents face on-time delivery problems, 28% face problems in having clear picture of Inventory and the rest 31% have Issues in identifying pending orders.

To test Organization does not require Upfront Capital Expenditure and IT hardware to be procured to support this solution:

Null hypothesis

H_{o} = they require upfront capital expenditure and IT hardware.

Alternate hypothesis

H_{a} = they don't require upfront capital expenditure and IT hardware.

T-TEST PAIRS=CQ1 WITH CQ2 (PAIRED)

/CRITERIA=CI(.9500)

/MISSING=ANALYSIS.

T-Test

PAIRED SAMPLES STATISTICS					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	CQ1	3.91	100	1.415	.141
	CQ2	3.59	100	1.198	.120

PAIRED SAMPLES CORRELATIONS				
		N	Correlation	Sig.
Pair 1	CQ1 & CQ2	100	.312	.002

PAIRED SAMPLES TEST								
	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1	CQ1 – CQ2	.320	1.543	.154	.014 .626	2.074	99	.041

Analysis

In the above SPSS analysis the significance value is less than o.5, so we reject the null hypothesis and accept that companies don't require upfront capital expenditure and IT hardware.

Test to rate the level of satisfaction for inventory management :

H_o = companies are satisfied with the inventory management

H_a = companies are not satisfied with the inventory management.

T-Test

ONE-SAMPLE STATISTICS				
	N	Mean	Std. Deviation	Std. Error Mean
BQ8	96	3.63	.997	.102

ONE-SAMPLE TEST						
	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
BQ8	35.611	95	.000	3.625	3.42	3.83

Analysis

In the above SPSS analysis the significance value is less than o.5, so we reject the null hypothesis and accept the alternative hypothesis. We conclude that companies are not satisfied with the inventory management.

The relation between number of employees in Companies using Cloud computing services

Null hypothesis ,H_o = There is a relation between numbers of employees in Companies using Cloud computing services.

Alternate hypothesis

H_a = There is no relation between numbers of employees in Companies using Cloud computing services.

Crosstabs

CASE PROCESSING SUMMARY						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
AQ1 * AQ4	100	100.0%	0	0.0%	100	100.0%

CHI-SQUARE TESTS			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.952[a]	3	.399
Likelihood Ratio	3.257	3	.354
N of Valid Cases	100		
a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is .37.			

Analysis

In the above SPSS analysis the significance value is more than o.5, so we accept the null hypothesis and reject the alternative hypothesis. We conclude that companies with more employees use cloud computing services.

FINDINGS

- We collected data about the company and its functionality. The structure dictates the relationship of various roles in an organization, and how people function.
- The specific product line would help us to assume the problems and fulfill their expectations and perceptions.
- The companies have problem with inventory management, identifying the pending orders and maintaining the database.
- Cloud computing is a way to increase capacity or add capabilities and work without investigating new infrastructure, training new personnel, or licensing new software.

SUGGESTIONS

- Complete overview of the company profile to analyze key manufacturing structure and management issues.
- To adopt dynamic high technology strategy to improve their productivity with subsidized price
- Proper data management system should be created for easy movement of data and proper assessment of data should be done.
- To compare your company's operations and management structure against competitor.

SCOPE FOR FURTHER RESEARCH

Further study can be done to compare the amount of resources saved by using cloud in comparison to other techniques.

CONCLUSION

Cloud computing is a better way to run your business. Instead of running your apps yourself, they run on a shared data center. When you use any app that runs in the cloud, you just log in, customize it, and start using it. That's the power of cloud computing. Finally, cloud apps don't eat up your valuable IT resources. This lets you focus on deploying more apps, new projects, and innovation.

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CLIMATE CHANGE AND VECTOR BORNE DISEASES: THE ROLE OF GIS & REMOTE SENSING

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ABSTRACT

Epidemiologists are adopting new remote sensing techniques to study a variety of vector-borne diseases. Associations between satellite-derived environmental variables such as temperature, humidity, and land cover type and vector density are used to identify and characterize vector habitats. The convergence of factors such as the availability of multi-temporal satellite data and geo-referenced epidemiological data, collaboration between GIS, remote sensing scientists and biologists, and the availability of sophisticated, statistical geographic information system and image processing algorithms in a desktop environment creates a fertile research environment. The use of remote sensing techniques to map vector-borne diseases has evolved significantly over the past 25 years. This paper reviews about the vector borne diseases that are caused/ induced by the climate change and the application of Geographical information system and remote sensing for the control of the disease and vector which is the reason for some of the most prevalent diseases worldwide. Examples are also taken from studies involving animal diseases that have considerable adverse effects on human welfare. The current status of GIS and remote sensing in epidemiology is assessed and suggestions are made on how, in the future, the two fields might be most profitably combined.

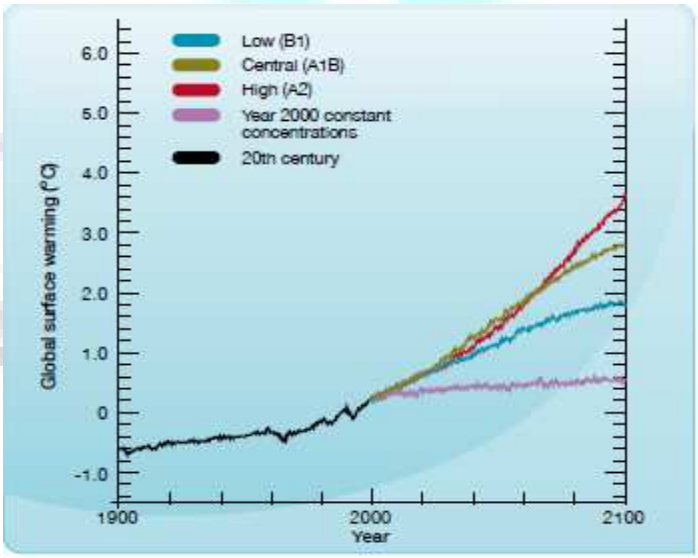
KEYWORDS

GIS, Vector borne diseases, disease mapping, remote sensing, Climate change.

INTRODUCTION

Global change refers to the complex of environmental changes that is occurring around the world as a result of human activities. The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (IPCC 2001). The rise in global average temperature is thought to be a direct result of the build-up of human-generated greenhouse gases (GHGs) – primarily carbon dioxide (CO_2) (IPCC 2001). Further average global temperature rises are predicted to take place during the 21st century between 1.1 and 6.4°C (2.0 and 11.5°F) depending on future GHG emissions and the Earth's response to changing conditions (IPCC 2007) (Figure1.1)The issue of human-induced climate change is a contentious one because it is difficult to detect a slight trend in average temperatures when it is masked by a large amount of annual variability. While the primary effect of global warming will be to increase the average temperature of the Earth, the features of climate change that deserve most attention in the context of vector-borne diseases are possible changes in the frequency and severity of extreme weather events and in climatic variability(Gill 1921).

FIG 1.1: SCENARIOS FOR SURFACE TEMPERATURE PROJECTIONS



Source:IPCC 2007

Current evidence suggests that inter-annual and inter-decadal climate variability have a direct influence on the epidemiology of vector-borne diseases (Githeko *et al* 2000). Warmer, wetter climes, particularly during breeding season, cold enable malarial mosquitoes to spread their range and survive longer, leading to increased rates of dengue fever and Schistosomiasis (Battacharya *et al*. 2006).This evidence has been assessed at the continental level in order to determine the possible consequences of the expected future climate change. By 2100 it is estimated that average global temperatures will have risen by 1.0–3.5°C, increasing

the likelihood of many vector-borne diseases in new areas (Watson *et al* 1995). The projections on climate change indicate an increase in average temperature of between 2.5°C and 5°C, and an overall increase in the intensity of rainfall of between 1 mm and 4 mm/day, except for small areas in north-west India. For many diseases these lie in the range 14–18°C at the lower end and about 35–40°C at the upper end (Watts *et al* 1987). If water temperature rises, the larvae take a shorter time to mature, consequently there is a greater capacity to produce more offspring during the transmission period (Reuda *et al* 1990). Malaria and dengue fever are among the most important vector-borne diseases in the tropics and subtropics (Bouma *et al* 1996); Lyme disease is the most common vector-borne disease in the USA and Europe. Encephalitis is also becoming a public health concern. Health risks due to climatic changes will differ between countries that have developed health infrastructures and those that do not. The sensitivity of vector-borne disease cycles to climate has resulted in the view that vector-borne diseases can serve as 'the canary in the mine' as a first alert of changes due to climate (Randolph, 2009). Although climate change has been linked to changes in the epidemiology of malaria (i.e. Githeko et al., 2000; Pascual and Bouma, 2009; Watson and McMichael, 2001) and dengue (i.e. Benitez, 2009; Hales, 2003; Patz et al., 1998), others have focused on the complexity of vector-borne disease cycles and proposed alternative likely explanations for the observed patterns of malaria (Lafferty, 2009; Reiter, 2001) and dengue (Gubler, 2002).

Climatic anomalies associated with the El Nin˜ o–Southern Oscillation phenomenon and resulting in drought and floods are expected to increase in frequency and intensity. They have been linked to outbreaks of malaria in Africa, Asia and South America. Climate change could worsen mosquito- borne diseases in Asia, where dengue fever and chikungunya fever have taken their toll, according to a leading expert. Dengue fever has increased dramatically in Malaysia from less than 1000 cases in 1973 to about 46 000 cases in 2007. When it comes to India, it is endemic for six major vector-borne diseases (VBD) namely malaria, dengue, chikungunya, filariasis, Japanese encephalitis and visceral leishmaniasis of which malaria ranks at number one with about 1.48 million cases annually and about 1,173 deaths in 2007. Japanese encephalitis, dengue and visceral leishmaniasis (kala-azar) also result in thousands of deaths annually. In addition to mortality, VBDs cause morbidity of millions of persons resulting in loss of man days causing economic loss. Over the years, there has been reduction in the incidence of almost all the diseases except chikungunya which has re-emerged since 2005. There is greater awareness about the potential impacts of climate change on VBDs in India and research institutions and national authorities have initiated actions to assess the impacts. Studies undertaken in India on malaria in the context of climate change impact reveal that transmission windows in Punjab, Haryana, Jammu and Kashmir and north-eastern states are likely to extend temporally by 2–3 months and in Orissa, Andhra Pradesh and Tamil Nadu there may be reduction in transmission windows. Impact of climate change on dengue also reveals increase in transmission with 2˚C rise in temperature in northern India. Re-emergence of kala-azar in northern parts of India and reappearance of chikungunya mainly in southern states of was a recent evidence for the effect of climate change on the vector- borne diseases.

Even if the variability of the climate relative to the average remains the same, there will be disproportionate changes in the frequency of extreme events, such as fewer frosts and more floods (white 1989), that can have large effects on disease vectors. In Vector-Borne Diseases, Vectors, pathogens, and hosts each survive and reproduce within certain optimal climatic conditions and changes in these conditions can modify greatly these properties of disease transmission. The ecology and epidemiology of vector-borne diseases can be described using the "disease triangle" of host-pathogen environment originally developed by plant pathologists. Unfortunately, our understanding of the underlying mechanisms that influence vectors, pathogens, hosts, interactions between all three, and vector-borne disease systems at all scales is rudimentary at best and hence forecasting the future of vector-borne diseases is fraught with uncertainty (Tabachnick, 1998; Tabachnick,2003).

TABLE 1: MAJOR VECTOR BORNE DISEASES IN INDIA (2008)

Disease	Cases/annum	Death
Malaria	1,524,939	935
Kala-azar	33,234	146
Dengue	12,561	80
Chikungunya	95,091 (suspected) 2,461(confirmed)	0
Japanese Encephalitis	3,839	684
Filariasis	26, 702 a	-

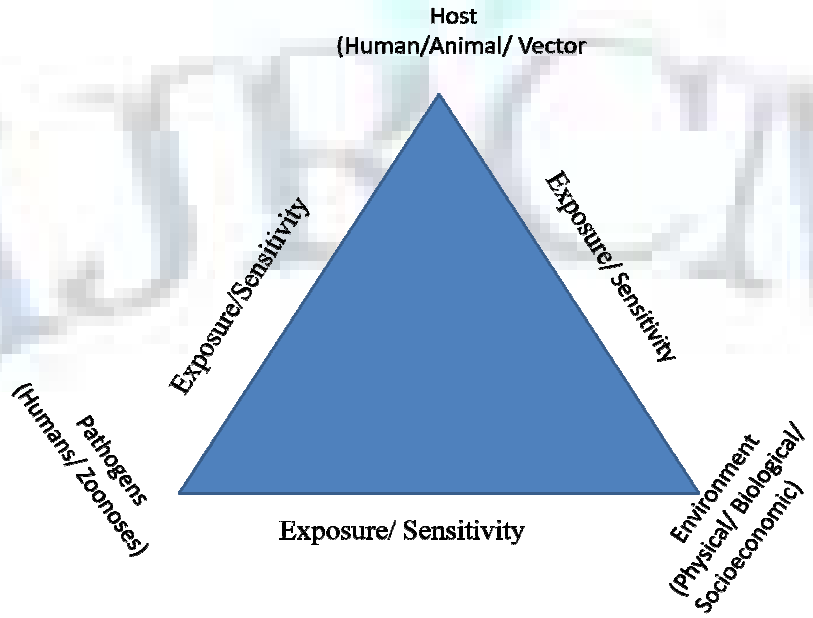
Source: National Vector Borne Disease Control Programme

[a] Cases of 2007 as per report of National Filaria Control Programme

Units; 508 million target population for Mass Drug Administration

Episystems might occur at different levels of scale. For example, one might define the episystem for a specific pathogen at the local level of a village or town, which may be a different episystem with different components and influences than the same pathogen defined at the countrywide, continental wide or the global level. Climate has direct effects on the vector, pathogen and host, and their interactions with one another, yet climate also has direct influence on other environmental factors that in turn may also directly influence vector-borne disease transmission cycles.

FIG.1.2 A HOST-PATHOGEN-VECTOR-ENVIRONMENT FRAMEWORK FOR THE ASSESSMENT OF RISKS TO HUMANS FROM VECTOR-BORNE DISEASES UNDER GLOBAL CHANGE

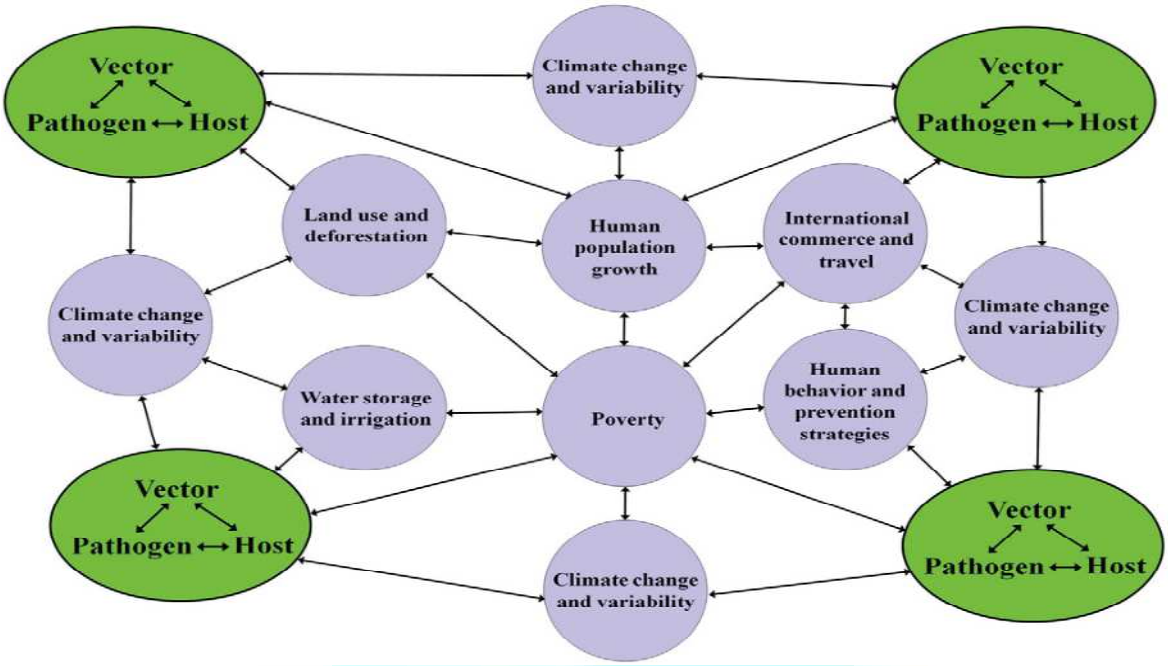


Although climate in the form of rising temperature has been proposed to influence the surge of increased dengue in the world in recent years, there is also good reason to believe that this surge may be due to the increases in the size and distribution of urban human populations, continuing poverty in many parts of the tropical world and an erosion of public health infrastructure in many regions (Gubler, 2002; Gubler, 2008).

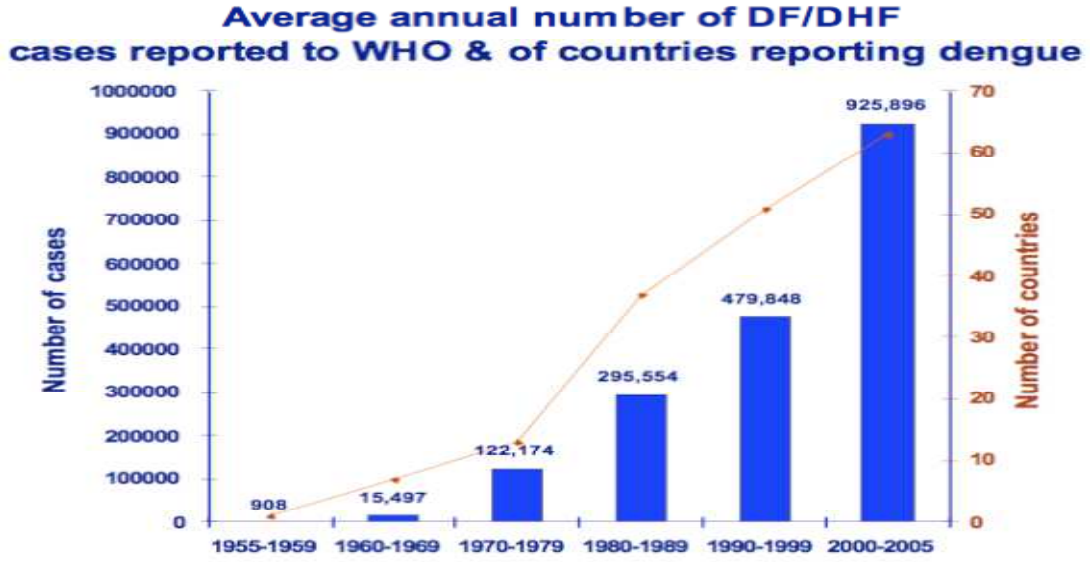
VECTOR-BORNE DISEASES

Emerging and resurging vector-borne diseases (VBDs) cause significant morbidity and mortality, especially in the developing world (Gratz 1999).Vector- borne diseases include, among others, malaria, with an estimated 247 million cases and nearly a million deaths in 2006, and dengue, with up to 50 million dengue infections and 500,000 cases of severe dengue hemorrhagic fever estimate to occur each year (WHO 2007, 2008). This burden is concentrated in the poorest regions of the World. For example, malaria alone is responsible for approximately 11% of the total disease burden in Africa, while all vector-borne diseases combined are responsible for less than 0.1% in Europe.

FIG. 1.3: THE VECTOR-BORNE DISEASE EPISYSTEM ILLUSTRATING INTERACTIONS BETWEEN SELECTED ENVIRONMENTAL FACTORS WITH EFFECTS ON THE VECTOR–PATHOGEN–HOST EPIDEMIOLOGIC CYCLE [MODIFIED FROM SUTHERST (SUTHERST, 2004)].

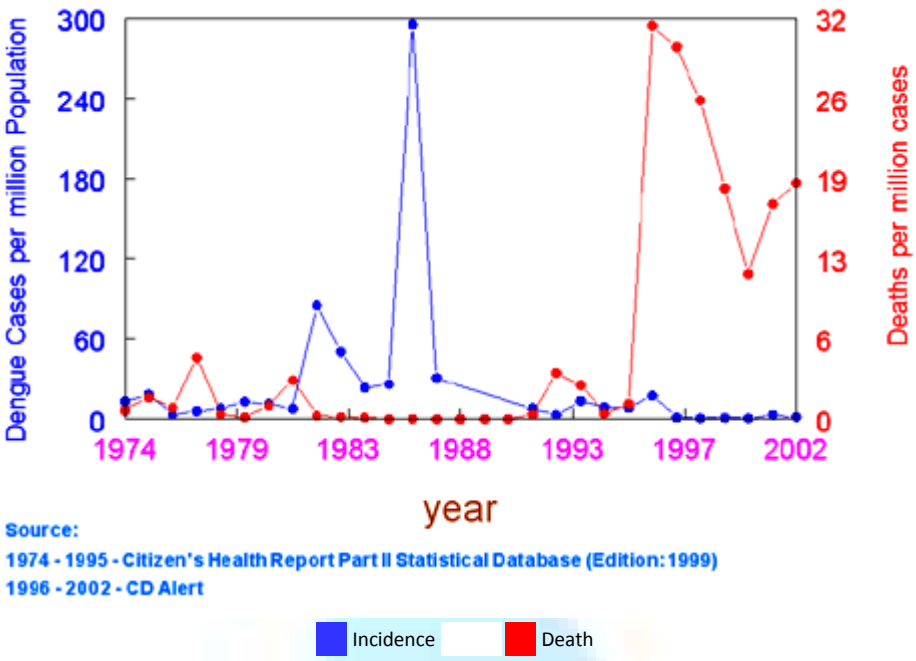


With approximately two billion people living in tropical and subtropical regions of the world, and an additional roughly 120 million people each year travelling to these regions, a large share of the world's population is at risk of contracting dengue (UNWTO 2006). Two estimates have suggested that between 50 and 100 million cases of dengue fever (DF) occur annually(WHO 2006) corresponding to an incidence rate of 2.5–5.0% of the two billion people worldwide at risk. These cases result in hundreds of thousands of hospitalizations, and about 20 000 deaths each year. The spectrum of dengue infection ranges from asymptomatic infection to death. Although death occurs rarely in the febrile phase, it is most commonly the result of hypoperfusion after the development of DHF. Between 250 000 and 500 000 people develop severe dengue each year (Deen *et al* 2009). Demographic and societal changes, decreasing resources for vector-borne infectious disease prevention and control, and changes in public health policy have all contributed to increased epidemic dengue activity, the development of hyper endemicity, and the emergence of epidemic DHF.



Source : WHO 2006

According to a report by the World Health Organization (WHO 1998), many countries in Asia experienced unusually high levels of dengue fever in 1998, as compared with other years.

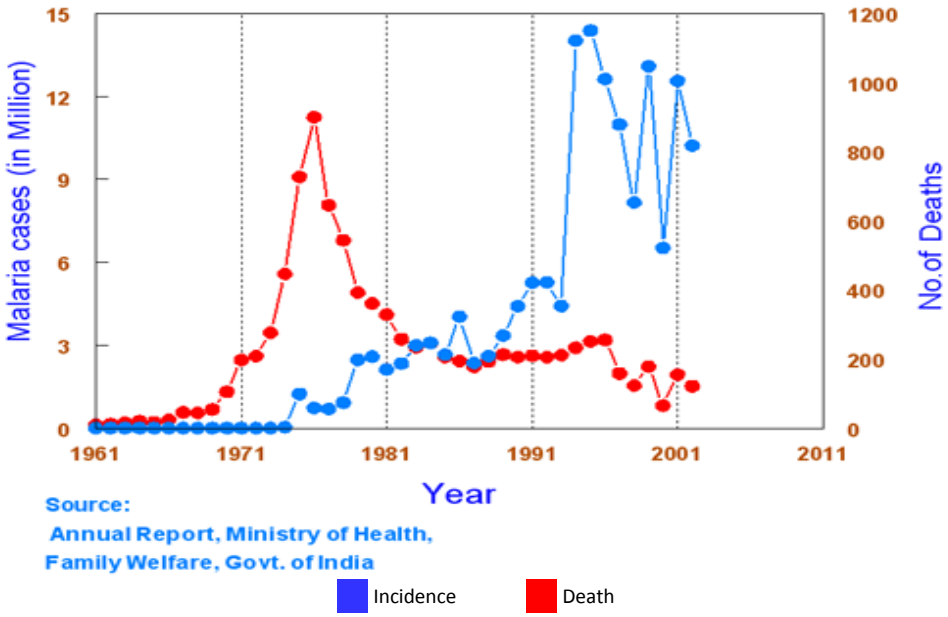


India's population is twice that of south-east Asia, the region that currently reports the most dengue-related deaths. Despite comparable environmental risk conditions, the number of reported cases and deaths in India is only a fraction of that reported in south-east Asia, In many regions of India, an increasing number of suspected cases of dengue are seropositive for IgM and IgG antibodies(Vijayakumar *et al* 2005).The existence of IgG antibodies in a patient demonstrates prior infection with dengue and an increased risk of the severe forms of the disease. Surveillance for dengue has been very limited in India and reporting to the central government has not been mandatory (WHO 1994). Although improvements are being made, the current gaps in epidemiological data and surveillance mean that the burden of dengue in India is uncertain.

MALARIA IN INDIA

In India the incidence of malaria during the past decade was between 20 and 30 lakh cases per year, with about 1000 reported deaths annually; this has shown no decline. The number of *Plasmodium falciparum* cases has also remained around 10 lakh per year. Many States had an Annual Parasite Index (API) of over 2/1000 in 2002; these include Arunachal Pradesh, Assam, Chhattisgarh, Goa, Jharkhand, Karnataka, Meghalaya, Mizoram, Orissa,Tripura, West Bengal, and Dadra and Nagar Haveli Vector-borne disease is not only an outcome but a cause of poverty. Countries with intensive malaria have income levels averaging only 33% of those without malaria, even after accounting for the effects of tropical location, geographic isolation, and colonial history (Gallup and Sachs 2001).

MALARIA INCIDENCE AND DEATH IN INDIA DURING 1961-2002



IMPACT OF GLOBAL WARMING ON VBDS

The epidemiological triangle of VBDs includes host, pathogen and a transmitting agent as insect vector/rodent with interaction of environment. All the VBDs are climate sensitive as the pathogens have to complete part of their development in particular species of the insect vector that transmit them. Gubler (1986) discovered that a great deal of precipitation which was brought about by the rainy season and the typhoons occurring in summer and fall encouraged the breeding and survival of mosquitoes. As the insects are poikilothermic creatures, developmental period of their life cycle and development of parasite in their

body are affected by climatic conditions. The role of climatic factors on vector-borne diseases has been studied extensively in various studies to understand the importance of it, if it's malaria the minimum temperature required for development of Plasmodium vivax parasite in anopheline mosquitoes is 14.5–16.5°C while for Plasmodium falciparum it is 16.5–18°C (Martens et al. 1995). At 16°C, it will take 55 days for completion of sporogony of P. vivax while at 28°C, the process can be completed in 7 days and at 18°C, it will take 29 days (WHO 1975). The duration of sporogony in Anopheles mosquitoes decreases with increase in temperature from 20°C to 25°C.

From 32°C to 39°C temperature, there is high mortality in mosquitoes (Craig et al. 1999) and at 40°C, their daily survival becomes zero (Martens 1997). The interplay between temperature and mosquitoes has recently been reviewed by (Dhiman et al. 2008). At increased temperatures, the rate of digestion of blood meal increases which in turn accelerates the ovarian development, egg laying, reduction in duration of the gonotrophic cycle and more frequency of feeding on hosts thus increases the probability of transmission (Martens et al. 1995). Reduction in duration of the gonotrophic cycle and the sporogony are related with increased rate of transmission (Macdonald 1957; Detinova 1962; Bruce-Chwatt 1980; Molineaux 1988). Rainfall helps in creation of mosquito breeding habitats and sometimes excessive rainfall causes flushing off the immature stages of mosquitoes. Excess rainfall can increase the breeding sites of mosquitoes and dry conditions can either eliminate or create several new breeding habitats in large water bodies such as lakes and rivers. The amount, intensity and duration of rainfall affect the population of mosquitoes (Russell et al. 1963). Rainfall also helps in increase in relative humidity (RH) and modifies temperature, which affects the longevity of mosquitoes, thus transmission of disease (Molineaux and Gramiccia 1980). If RH is below 60%, the life of mosquitoes is shortened which in turn reduces disease transmission. RH (60–80%) is considered to be optimum for effective transmission of malaria (Pampana 1969). Despite evidence that climatic patterns, including temperature and rainfall patterns, have direct effects on vector-borne diseases, there are reservations about the potential for predicting future effects of climate change on vector-borne diseases (Dobson, 2009; Fish, 2008; Gould and Higgs, 2009; Gould et al., 2006; Gubler, 2002; Gubler, 2008; Gubler et al., 2001; Lafferty, 2009; Randolph, 2009; Reiter, 2001; Reiter et al., 2004; Russell, 1998; Sutherst, 2004). These papers explore alternatives to climate-driven hypotheses for vector-borne disease epidemiology and generally point to the need for greater understanding of the ecology of vector-borne diseases in order to understand and predict the effects of future changes in the environment.

Thus, climatic conditions play important role in the distribution, degree of endemicity and epidemicity of diseases in an area. Some areas, which have most favourable conditions of temperature and rainfall, experience transmission of disease throughout the year while in areas experiencing colder months, transmission is seasonal and does not take place throughout the year. Many papers have explored the potential consequences of global climate change, particularly the impact of global warming, on vector-borne diseases (Dobson and Carper, 1992; Epstein, 2000; Epstein, 2007; Githeko et al., 2000; Greer et al., 2008; Hay et al., 2002; Kobayashi, 2008; Linthicum et al., 2008; Sutherst, 2004; Toussaint et al., 2006). The Intergovernmental Panel on Climate Change (IPCC, 2001; IPCC, 2007) lists vector-borne diseases among the most likely consequences to change due to changes in climate. Recent advances in Geographical information systems and new mapping techniques have paved the way for public health administrators to improve their planning, monitoring analysis and management of health systems.

In epidemiology with the association of GIS with RS (Remote Sensing) aids in visualizing and analyzing geographic distribution of disease with respect to time and space that is more difficult and impossible to perform in other way. The epidemiology of VBDs is complex and involves many factors. In this review, we focus on how advances in mapping, Geographic Information System (GIS), Remote Sensing (RS), and Decision Support System (DSS) technologies, and progress in the fields of spatial and space-time modelling, can be harnessed to reduce the burden that VBD inflict on humans.

REMOTE SENSING IN VBD

Mosquito borne diseases are prevalent throughout the world, and remote sensing applications in epidemiology have been most widely used to study mosquito-borne diseases. Remote sensing satellites provide continuous measurements of the earth and its environment, and offer a synoptic monitoring capability. Satellite remote sensing technology has shown promising results in assessing the risk of various vector-borne diseases at different spatial scales. Satellite measurements and other remote sensing techniques cannot identify the vectors themselves, but may be used to characterize the environment in which the vectors thrive, However, it is not possible to spot mosquitoes on satellite data, this is because of their relatively small size, which ranges from only 6 to 15 mm (average) whereas the highest resolution civilian satellite data available are at approximately one meter. Nevertheless, through the identification of habitat (which is a collection of soil, water, rocks, flora, fauna, and air) we can locate mosquitoes and their effects, such as malaria, with high accuracy.

Environmental variables such as land and sea surface temperature and amount, type, and health of vegetation can be identified and measured from space. The use of remote sensing techniques to map vector species distribution and disease risk has evolved considerably during the past two decades. The complexity of techniques range from using simple correlations between spectral signatures from different land use–land cover types and species abundance (Beck *et al* 1999) to complex techniques that link satellite-derived seasonal environmental variables to vector biology (Rogers et al 2002). Remote sensing data can be used at a regional scale to identify and monitor temporal and spatial vegetation characteristics, such as plant density, structure, biomass, and green leaf area which can then be used to infer attributes of larval habitats of disease vectors (Jovanovic, 1987).

Landsat data was used to determine green leaf area index (LAI) over 104 rice fields, and these measurements were compared to larval counts of Aedes freeborni at the edge of the fields and the minimum distance from the centre of each field to the nearest livestock pastures that provide the blood-meal source (Beck *et al* 1991) This analysis showed that fields that are near pastures that have high LAI and tiller density produce large numbers of mosquitoes, and fields with low LAI that are further from the pastures have lower numbers of mosquitoes. A combination of spectral measurements from the satellite data and distance measurements to pastures were used in discriminant analysis to identify high mosquito producing areas with 90% accuracy. Multispectral data from the SPOT (Satellite Probatoire d'Observation de la Terre) satellite was used to map the probability of mosquito presence in Belize (Roberts et al 1996). This study measured the distance of houses from waterways, altitude above specified waterways, and amount of forest between houses and waterways. This study measured the distance of houses from waterways, altitude above specified waterways, and amount of forest between houses and waterways. The use of RS in conjunction with GIS to predict areas of high mosquito density is illustrated in several studies from Central America. Rejmankova et al. (1995) used RS to estimate land-cover elements in Belize and then predict areas with high/low densities of *An. albimanus*.

Remote sensing data helps to identify and track environmental characteristics and changes useful to the study of the diseases. Satellite data can be used to monitor vegetation, land-use patterns, surface waters, soil moisture and quality, roads, build up areas and climatic changes. Remote sensing data allows the user to extrapolate local level measurements to a regional level and a discern spatial and temporal patterns that could not be otherwise seen. The potential of remote sensing has in principle been early recognised and adopted though. To facilitate the investigation of the Rift Valley fever, already in the 80's the data of a meteorological satellite have been used to produce an indicator of potential viral activity in Kenia (Linthicum et al.,1987).

Jovanovic (1988, 1991) briefly reiterated the utility of satellite data for monitoring of diseases by identifying operational areas of RS for present and future applications in public health activities. These include: (a) assessment of air, soil and water pollution by chemical and physical or biological pollutants harmful to human needs; (b) comparative studies of environmental pollutants and prevalence of environmentally-related human diseases; (c) rapid detection of environmental conditions favouring the growth of disease pathogens; (d) identification of sources of various pathogenic agents and their environment; (e) improving the planning and logistics of environmentally-related public health programs; (f) monitoring environmental changes during natural disaster; and (g) surveys of socioeconomic and more general situations related to human health.

To give a logical structure to the application and usage of RS in parasite and vector studies, Hugh-Jones (1989) indicated three phases of research: habitat identification and determination, variability in vector habitats and integration of other epidemiological factors. Arambulo and Astudillo (1991) demonstrated that RS and GIS have potential in a number of public problems like vector-borne infections. RS and GIS also were used as an integral part of a surveillance system in Israel in 1992 for the observation of imported cases of malaria, and when combined with the identification of the intervention areas, enabled malaria transmission to be kept within bounds (Kitron *et al.,* 1994). Clarke *et al.* (1991) evaluated the use of RS and GIS in UNICEF's dracunculiasis (Guniea Worm) eradication effort by applying Landsat TM data for the monitoring of this disease. Wood *et al.* (1991) determined that early-season rice canopy development, as

monitored using remotely sensed data, can be used to distinguish between high and low mosquito producing rice fields. New satellites and airborne systems will improve the precision, accuracy.

The combination of remotely sensed images with GIS provides extensive opportunities in the study of vector-borne disease and the following section details some studies of this type. Epstein (2000), in a recent article in *Scientific American,* examines global warming effects on the rise of diseases such as malaria, provides examples of risk maps, details some of the advantages of RS techniques for disease study, and encourages the research community to use satellite images for the monitoring of conditions which allow the vectors and diseases to proliferate.

GEOGRAPHICAL INFORMATION SYSTEM IN VBD (GIS)

Technological advances over the last decades with relevance to VBDs include the emergence of molecular techniques for vector species identification and pathogen detection and identification, and a rapid evolution in hardware and software options to support data collection, management, and analysis. These advances are now dramatically changing our capacity to predict, prevent, and control VBDs. The application of GIS to the health field is quite recent, but interest is growing among those involved in environmental and health research, and examples exist in the fields of geographical and environmental epidemiology, risk assessment, and public health (Trinca, 1998). Because of the ability to identify and map environmental factors associated with disease vectors, GIS are increasingly important in infectious and vector-borne surveillance. Examples include malaria (Kitron *et al.,* 1994), Lyme Disease (Glass *et al,* 1995), and Onchocerciasis (Richards, 1993), among others.

A Geographical Information System (GIS) is a computer-supported system consisting of hardware, software, data and the corresponding applications (Bill 1999). By means of GIS, data can be digitally recorded and edited, stored and reorganised, shaped and analysed as well as presented in an alphanumerical and graphic mode. GIS has many applications to the study of vector-borne diseases, as many of the underlying processes influencing the distribution of insect vectors of disease are spatially heterogeneous. Recently, there has been interest in applying GIS to study the continental and global distribution of malaria and the mosquitoes that transmit malaria (Coetzee, Craig and Le Sueur 2000; Craig, Snow and Le Sueur 1999; Omumbo et al. 1998). These continent-scale studies have also been used to estimate the impact of global warming on the distribution of mosquitoes and malaria.

GIS, in combination with remote-sensing (RS) technology, has also been employed to predict areas of high productivity of mosquitoes and potential malaria epidemics based on the detection of proxy ecological variables (Hay et al. 2000; Thomson et al. 1996). Mapping of disease incidence in GIS can readily be converted into areas of disease risk and then associations made with any related ecological indicator that appears to be involved, for instance, malaria infection with water bodies and vegetation.

GIS has two different types of data: on one hand geometric data which are the co-ordinates of points defining also curves and areas and on the other hand the attribute data containing the factual information. The functionalities of GIS include, among other things, the following selected aspects (Scholten and de Lepper, 1991; Briggs and Elliot 1995; Clarke et al., 1996):

- Data capture: data input by user employing scanner, digitizer tablet, keyboard etc., or data import from digital sources.
- Data check: plausibility, revision and completion.
- Data integration: transfer of data sets into a consistent geographic data structure by generalisation, co-ordinates transformation resp. Translation etc..
- Data storage: spatial data are stored as grid or vector data. Advanced GIS can process both types of data in hybrid systems. Normally, the data are stored in intra system data bases.
- Data retrieval: basic functions for a user-defined query of data bases.
- Data analysis: GIS provides a broad range of tools to analyse the database. In this respect, all GIS functionalities can be used, in particular the visualisation methods.
- Data display: the most important display format of GIS are maps. But also tables and graphics are possible formats for the presentation of results.

The value of GIS for VBD applications is its ability to seamlessly integrate disparate types of data and information such as environmental conditions, substance characteristics, fate and transport models, and spatio-temporal disease transmission characteristics. GIS supports multidisciplinary analysis using a systems approach and provides the ability to perform predictions of outbreaks based on available information. A number of issues must be considered when developing such a system including: (1) data quality; (2) personal confidentiality; and (3) methodological pitfalls (Albert, 2000). The currency and completeness of data incorporated into the system must be maintained. The scales of data used must be appropriate for the model or application they support. For example, 1 km imagery will not be appropriate for mapping wetlands and likewise, a 1:5000 land cover GIS is not necessary for performing climate modelling. RS could also be used as a tool for rapidly identifying potential vector breeding-sites to supplement a GIS approach to targeted vector control. The remote sensing data are increasingly used for investigations in the field of environmental health sciences for risk mapping, surveillance or monitoring, particularly of vector-borne diseases (Beck et al., 2000). Since the disease vectors make specific demands as to climate, vegetation, soil and other factors, remote sensing can be used to determine the habitat. Remote sensing is frequently applied on the investigation of the malaria risk. Anopheles lives, depending on species, in specific habitats. Thus in numerous studies, the habitat of Anopheles is analysed and compared with the incidence of malaria (Srivastava et al., 1999; Beck et al., 1994, 1997; Dale et al., 1998; Thomas et al., 2000; Hay et al., 1998). The advanced and technically improved conditions of the IKONOS satellite picture data performing a high geometric resolution are most suitable for investigations on a large scale (Meinel and Reder, 2001) and may open up new opportunities for innovations.

VBD SURVEILLANCE USING GIS

The development of GIS during the past 40 years provided the impetus for geographers to analyze large-scale spatial patterns (Glass *et al.,* 1995), but the real GIS revolution began in the mid 1980s and has since spread to almost all countries of the world (Openshaw, 1996). Croner *et al.* (1996) identified GIS, a hardware and software configuration with digital geo-referenced data for analysis and display, as a much-awaited tool for professionals in the field of public health. Disease surveillance requires professional analysis and sophisticated judgement of data leading to recommendations for control activities. The ultimate objectives of surveillance is prevention of disease. Disease surveillance involves the mapping the disease in terms of (a) disease, (b) host, (c) vector and (d) parasite. It includes monitoring the disease in human populations, pattern of drug resistance in the vectors and parasites, and the intensity of transmission by the vector populations.

Mapping the disease - Maps provides the graphic representation of the health issues. Among the disease maps confined to the collection, description and presentation of spatial disease distribution, dot maps, diagram maps, choropleth maps and flow maps are to be distinguished. Within dot maps, each dot represents the coordinates of one or more health events. Choropleth maps display the prevalence or incidence of health events for defined areal units (e.g. administrative districts) by colouring, shading or hatching. Diagram maps include the presentation of quantitative data in diagrams. Flow maps display the distribution dynamics of health events in time and space. Disease maps translate information into a certain spatial structure, facilitate the handling of spatial dimensions (Cliff and Haggett, 1988) and help to communicate complex epidemiological coherences. The first geographer who devoted his attention to disease mapping was August Petermann (Diesfeld, 1995). When he recorded the cholera epidemics on the British Isles for the years between 1831-1833 (Petermann,1852), the map was a fundamental tool and featured a remarkable quality. The oldest examples known are a world map of diseases drawn up by Finke in 1792 (Barrett, 2000b) and a mapping of yellow fever occurrences in the harbour of New York issued in 1798 (Stevenson, 1965).

Mapping the host - GIS can be used to map the host communities. When different host are exposed to a same parasite, their susceptibility may range from negligible to fatal. GIS can be used to determine the population and also stratify the risk factors. It will give the better way of the host- parasite relationship by giving us the potential breeding sites of the vectors, their prevalence and mortality.

Mapping the vector - The most important in the vector -borne control decision support system is the availability of the vector abundance data. Remote sensing data is much important in GIS to predict about the vector breeding sites.

Mapping the parasite – Mapping the parasite is the most important task, because a particular species of parasite is responsible for various diseases and it is useful to make an ideal vaccine for that corresponding disease.

VECTOR BORNE DISEASE DECISION SUPPORT SYSTEM

A GIS-based decision support system (DSS), with a remote sensing component, could significantly improve the management of vector borne disease events by providing: (1) an improved prediction capability based on climate and environmental models; (2) improved remediation measures through efficient allocation of resources; and (3) improved methods of prevention by providing a capability to perform scenario evaluation. A GIS based decision support system comprised of 4 stages: (1) planning; (2) mitigation; (3) response; and (4) recovery/ preparedness. In the planning stage, the DSS provides the ability to monitor environmental conditions and habitats and perform environmental forecasts. If conditions are deemed likely to facilitate a VBD, the mitigation stage is entered where the DSS will perform a series of modeling activities based on the planning inputs and assist decision makers in developing mitigation plans for the pending outbreak. Note that these plans include not only environmental and health forecasts, but also economic and resource forecasts as well. Based on these forecasts, a response can be formulated which reduces the impacts of the VBD. In this stage, the ill are tended to, destruction of the vector is performed, and the public is alerted to the presence of an outbreak. In the last stage of recovery/preparedness, environmental restoration is performed, potentially harmful material is removed (such as tires in the case of Rift Valley Fever), and hospital inventories are stocked with appropriate supplies. Through this four-stage process, lessons are learned, needed improvements to existing models can be identified, and ultimately improved management of VBD events will result.

CONCLUSION

Resurgence of vector-borne diseases in endemic areas and their introduction into new areas create havoc among health planners. As a result, they are searching for innovative technologies to control these ailments. One ideal solution for the monitoring of such diseases is satellite imagery which is critical for mapping and locating vector habitats, and GIS can be used to help understand the complex relationship between human and vector behavioral patterns (Corbley, 1999). Therefore, as reviewed in this paper, RS and GIS techniques offer significant potential for application to disease detection, monitoring, and prevention. The variety of analyses using different GIS tools demonstrates tremendous capabilities of the technology available to epidemiologists and researchers. Integration of GIS with remote sensing helped in identification, characterization, monitoring and surveillance of breeding habitats and mapping of malaria risk areas. GIS provides the necessary infrastructure for an end-to-end VBD decision support system for monitoring and responding to the critical phases of vector borne disease. Remote sensing can play an important role in this system by providing environmental information and supporting larger scale models. With the power of the tools of RS and GIS, geographic analysis of disease distributions, causes, and effects can be deducted. The VBD DSS could significantly enhance the ability of local communities and government organizations to conduct contingency planning for future outbreaks. A GIS based VBD decision support system would not only benefit the stakeholder community, but would also provide valuable analysis capabilities to other related domains such as bio-surveillance, health care forecasting, and national issues such as country's stability and it is user- friendly and more affordable. Studies using RS in conjunction with GIS will help identify gaps in our knowledge of the characteristics of larval biology and may even be used as a predictor of areas of high disease transmission. In this review, it have been shown that RS and GIS techniques significantly contributed in the studies of vector-borne diseases and their role for the monitoring of these diseases cannot be further over-looked.

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FEASIBILITY STUDY FOR IMPLEMENTATION OF AN ACTIVITY- BASED COSTING SYSTEM (ABCS) IN ALLOY STEEL INDUSTRIES (ASI)

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ABSTRACT

Precise appraisal of products and submission of suitable reports for decision-making is the goal of a costing system. Therefore, one of the concerns of steel industry is providing finished price to remove the weaknesses of absorptive costing system and providing proper information to access an integral quality. In fact, this system is one of the powerful and suitable tools for companies to access their goals and to preserve their competitive power. This paper studies the effective factors for a feasibility study for implementation of an activity-based costing system (ABCS) in alloy steel industries of Iran. The factors that deviate finished price in absorptive costing are: high production overload, production complexities, production diverse, volume diverse, production physical size diverse, complexity of raw materials, high inventory of finished semi-finished products at the end of period, and recognition of cost storages and cost-creation factors. Survey method was used to gather data including library, interview, and questionnaire. T Test was used to confirm or reject the assumptions. It was found that implementation of an activity-based costing system is feasible in ASI.

KEYWORDS

Activity-based costing, management accounting, product-level activities.

INTRODUCTION

Steel industry is a mother industry in country. Researchers believe that development is not possible without steel industry. Events such as world competition development, IT development, access to information systems during last two decades, and efforts of economic agents to meet world ranks and to enter into international markets necessitate views such as customer satisfaction and activity-based management.

Also, by increment of technology and other overload costs shares on production and services, traditional costing methods are obsoleted, while data for finished prices of products, services and customers are the most important one in financial information. Inefficiency of information by traditional costing systems has directed economic units toward activity-based costing system (ABCS). ABCS is one of the modern costing systems for products and services with capabilities such as calculation of finished price, improvement of production process, removal of abandoned activities, recognition of cost motives, operational planning, and determination of commercial strategies for an economic unit. This system concerns with cost and production creation reasons instead of concerning with effects, and if an activity is not justifiable, it will be removed, adjusted, or improved. Despite innovation of new methods in production styles and tools, costing systems are ever criticized. By a short review of the literature of management accounting and ABC, we try to identify the effective factors on implementation of ABC in ASI.

PROBLEM EXPRESSION

Companies have no other way to accompany with rapid changes of technology, so they try to use modern methods to improve their business quality and to control finished prices of their products. In this situation, companies are going to change their information systems and removal of traditional systems. Competition implies control of costs. Here, we study absorptive costing method. Regarding to diversity of products and processes, and regarding to sever competition in steel market, this method cannot respond information needs of managers. Now, we ask "Is it possible to use ABCS regarding diversity of activities, cost structures, production processes, and products?"

GOAL OF RESEARCH

One of the main goals of finished price accounting system (FPAS) is providing proper information for finished prices of products. If a trade unit has its production costs, it can concentrate on the most profitable activities and avoid non-profitable ones.

Available costing systems have weaknesses, because they report finished prices improperly when there are diverse products. ABC determines costs precisely. The strategic goal of this system is providing suitable information for costs and profits for better decision-making about prices, production combinations, and improvement of operations. The main goal of this research is "Feasibility study for implementation of an activity-based costing system (ABCS) in Alloy Steel Industries (ASI)".

TABLE 1: ASSUMPTIONS

Main assumption	Implementation of ABCS in ASI is feasible.
Sub-main assumption 1	Overload production share is high in ASI.
Sub-main assumption 2	There is production complexity in ASI.
Sub-main assumption 3	There is production diversity in ASI.
Sub-main assumption 4	There is production volume diversity in ASI.
Sub-main assumption 5	There is products' physical size diversity in ASI.
Sub-main assumption 6	There is raw material complexity in ASI.
Sub-main assumption 7	Inventory of finished and semi-finished products is high in ASI.
Sub-main assumption 8	Cost storage and cost-producing factors can be recognized in ASI.

THEORETICAL FUNDAMENTALS AND ACCOUNTING INFORMATION SYSTEM (AIS)

In practice, all organizations have AIS. These systems are similar in three cases: structures, processes, and goals. These items are more complex in production companies. Generally, accounting is recognition, measurement, recording, classification, and redaction of financial effects of transactions, operations, activities, and other conditions of financial events affecting on an economic unit and converting this data to comprehensive reports for beneficiaries and decision-makers. Accounting is the art of interpretation, measurement, and transferring the results of economic activities and operations. Accounting is the language of trade. Expressions like asset, debt, net profit, cash fund circulation, and share profit are common in accounting.

The goals of AIS can be used to:

1. Determine major strategies and long term planning
2. Make decisions about resource assignment
3. Plan and control financial reporting
4. Measure performances of staff

CALCULATION OF FINISHED PRICE PROCESS IN TRADITIONAL SYSTEMS AND ITS FAULTS

Improvement of production technology and changes of management thought for inventory, on-time production, and other factors have severely modified product costs structures and have increased overload costs and decreased direct and raw material costs.

In traditional systems, often direct labor cost is used to assign overload cost. While today, direct labor cost mostly include less than 15% and overload costs include more than 50% of product costs.

Therefore, assignment of overload costs up on direct labor hours conclude incorrect calculation of finished price.

In traditional system, finished price is calculated as follows:

1. Assignment of direct materials and direct remuneration to products and services
2. Assignment of overload costs to products and services by a certain absorption rate
3. Calculation of finished price

Disadvantages of this system are:

1. Direct labor cost has no value any more.
2. Usage of a certain assignment rate cannot show all relations between costs.
3. Despite high share of overload cost in product cost, its assignment method is not important.
4. This system does not respond in complex and unusual production processes.
5. This system does not provide proper and real information for finished price and profitability.

To overcome these faults, many companies have gravitated toward ABCS. This system does not replace order costing of step-by-step method, but it can be used in parallel of them. ABCS includes modern philosophy of managers (customer satisfaction) and competition in product costing quantitatively. Namely, rather than costs of direct material and direct remuneration, this system includes technology costs, product quality costs, and flexible production costs, too.

ACTIVITY BASED COSTING SYSTEM OVERVIEW AND BACKGROUND

In late of 1960s and early of 1970s, some writers pointed to the relation between activity and cost. However, in 1980, following reflection of weaknesses and deficiencies of common accounting systems to report cost information, universities noticed to this relation much more. This notice was based on three main structures:

1. **Structure 1:** Modern changes to introduce modern production technologies and mechanisms in different countries such as Japan,…
2. **Structure 2:** Mental philosophies of many company managers have largely changed in 1980s, and rather than profitability, international competition, customer satisfaction, quality control, and cost decrement also were added to their goals.
3. **Structure 3:** Many accounting writers proceeded to describe new production space, different roles of technology, and new views of managers. These writers claimed that not only traditional systems of industrial accounting could not respond needs of managers, but also their output might deviate managers.(Oava, 2002)***[1]***.Then, those writers introduced a new system called “Activity-based Costing System”.

ABC/M is a two-stage process, (1) associating cost to resource (activity), and (2) selecting an appropriate activity measurement (activity cost driver), [2]. Kee[3] named the two steps as; (1) breaking overhead costs into different cost pools and (2) assigning overhead costs hrough different activity cost drivers to products or orders. As a result, a more accurate overhead costs assignment is achieved. ABC/M supporters highlight two principal objectives, [4] and [5]: (1) to provide detailed information about the costs and consumption of activities in a specific process and (2) to provide accurate information for managers to improve decisions. This has also been corroborated by Gosselin[6] regarding a pilot and full ABC/M implementation studies. However, the use of ABC/M has been limited to a cost accounting approach, rather than as a managerial technique (Gosselin[6]; Kaplan and Anderson [7]; Gosseling[8]). ABC/M advantages, and constructive effects, on a firm's performance have been determined through numerous studies and dissertations. Kennedy and Afleck-Graves [9], Ittner et al. [10], and Cagwin and Bouwman[11] attested ABC/M as a preferable accounting approach compared to the TCA systems. Some studies such as; Novićević and Antić[12] and Cagwin and Barker [13] showed evidence of a positive impact of ABC/M on lean manufacturing components like Just-In-Time (JIT) and Total Quality Management (TQM). The preeminence of ABC/M in providing detailed cost information represents a potential powerful approach for developing PTP Supply Chain Decision Support Systems. Malik and Sullivan [14] developed an ABC/M-based Mixed-Integer Programming (MIP) decision support model for product mix problems. Kee[3] integrated some aspects of the Theory of Constraints (TOC) in ABC/M-based MIP modeling for the product mix problem and named it “Expanded ABC/M model.” The model identifies the firm's optimal product mix by evaluating simultaneously the resources and product cost, the production resources availability, and the business marketing opportunities. In Supply Chain Order Management, [15] and [16] presented a PTP– MIP model for accepting or rejecting orders by implementing ABC/M homogeneous cost pools' structure originally introduced by Cooper and Kaplan [2]. The purpose of the model was to gain insight into how significant Order Management decisions are in maximizing profitability when the firm has insufficient production resources to satisfy all the demand. Khataie et al. [17] added the possibility of pursuing two main different goals simultaneously, reducing the residual capacity and increasing the profitability to the previous models. A powerful PTP Order Management tool assists management to monitor, analyze, and foresee the consequences and outcomes of each decision, and monitors their business competitiveness factors dynamically.

WHICH COMPANIES SHOULD USE ABCS?

Using ABCS is not suitable for some companies and is ineffective for some others. ABC is suitable for companies with the following features:

1. Companies with different products and services.
2. Companies with high overload costs, so that these costs cannot be assigned their products equally.
3. Companies that use automatic machinery in production.
4. Companies with complex and unusual production processes.

CLASSIFICATION OF COSTS IN ABCS

1. Unit-level activities: which one unit is produced in each production step;
2. Batch-level activities: which one batch is produced in each production step;
3. Product-level activities: which different products are produced by supply;
4. Factory-level activities: which support general production process of factory.

The first three levels deal with those costs that can be assigned to products directly. However, the first level includes common costs for products and they can be divided between products optionally (e.g. lighting and cleaning costs).

ABCS is a modern phenomenon that has developed traditional costing thought in management accounting and has attracted notices of many economic units. Some of advantages of this system are:

1. Improvement of costing system and better assignment of costs
2. Determination of finished price and pricing more precisely and logically
3. Control of operations and better planning
4. Better evaluation of financial operations of managers
5. Removal of none value-added activities

Despite these advantages, today only scientific communities contribute ABCS and factories and industries have not contributed to it so much. Its reason is unfamiliarity of managers, industries, and related personnel and fear of costs of implementation of this system.

ABC IN ASI

ASI has a special place as one of the economic development branches between industries. This industry plays an important role in manufacturing of industrial parts. Products of this industry in country compete with similar external products.

The nature of this industry increases complexity of decisions by its structure and shape and its capital-consuming nature. Usage of suitable methods follows cost-saving and prevents incorrect decisions and methods.

Progressive trend of orders in internal and external markets have made it inevitable to move toward optimization of activities with high qualities and low prices. Therefore, necessity of using modern techniques is understood regarding the above mentioned conditions in industries of Iran and the concepts of ABCS. As mentioned before, this system was not paid attention too much, especially in its data gathering aspect and offering on-time information submission.

Traditional costing method deviates product costs because of its cost division methods. Traditional costing method emphasized on production volume and assigns all overload costs by a certain rate to products. But, ABC method assigns costs more properly.

Traditional costing method overstates costs of large products and understates costs of small products. It also overstates overload costs for high-produced products and understates overload costs for low-produced products. Such deviations often intensify each other so that cost of a product may be over or understated.

If resources for a unit of a product are not directly proportional to its other resources, traditions costing systems that depend product unit, report product costs improperly. Here are samples of cases that cause improper reporting:

- Diversity of production volume
- Diversity of production complexity
- Diversity of physical size of products
- Diversity of raw materials

The effects of different diversities can be recognized by ABCS. Each diversity needs an activity motor. Since traditional costing system uses a certain basis for division of overload costs, this deviates finished price of products. ABC can be implemented in companies with much overload cost and much product diversity (diversity in volume, physical size, complexity, and raw materials). Product diversity causes ABCS to determine overload costs properly. In turn, this causes proper finished price. Ongoing products and end of period finished products cause different profit reports between ABCS and traditional costing system. Ongoing products and end of period finished products cause conveyance of costs to next period. But, if there is not end of period inventory, reported profits for both systems will not be different very much.

RESEARCH METHOD

Since selection of research method depends on the goal and nature of research subject, survey method was selected.

MEASUREMENT TOOLS AND DATA GATHERING METHODS

One of the most important sections of a research is data gathering and editing. The selection of data gathering method depends on research nature, data type, and limitations.

Some studies use all recognized methods (interview, observation, questionnaire, etc.). In this research, the researcher has used the following methods:

a) Library
b) Interview
c) Questionnaire

DATA ABRIDGEMENT

a) Library method

For assumption 1, this method says that share of overload is high. Table 2 shows comparison of overload costs to total finished price costs, including direct material costs and direct remuneration costs for three years.

TABLE 2: OVERLOAD COSTS IN PRODUCTION

Item	2012	2011	2010
Production overload	48%	53%	48%
Direct materials	42%	34%	40%
Direct remuneration	10%	12%	12%
Total	100%	100%	100%

b) Interview

The researcher interviewed with managers and experts since they were colleagues of him. So the researcher could gather data by direct observations. Table 3 shows production complexity in ASI. Table 4 shows production diversity in ASI.

TABLE 3: COMPLEXITY IN ASI

Equipment / operation	Description
Electric arc furnace	To prepare primary melt, dephosphorization, and initial analysis set (20 ton)
Ladle furnace	To final set of analysis, temperature, desulfurization, and melt homogenization (20 ton)
Vacuumed degasification and decarbonization system	To decrease of remove dangerous gases in melt and decrement of carbon in stainless steel (20 ton)
Drip melting	To melt and treat steel and to increase its metallurgical properties
Heating furnaces and heat operations	To preheat, heat, and heat operations in different capacities (max. 90 ton)
Open die press	Hydraulic press to produce sections larger than 350 mm and hollow sections (3150 ton)
Four-hammer forging machine	To produce round, square, and stair sections less than 350 mm
Vertical furnaces for volume hardening	To tamper sections up to 1.6 m in diameter and 13.5 m in length and 20 ton
Warp-removal press	To remove cold and hot warps (1000 ton)
Induction hardening machine, cold roller	To harden with 30-70 mm in depth and 18 ton roller
Horizontal hardening machine, cold roller	To harden with 30-70 mm in depth and 20 ton roller
Gas tamper furnace (50 ton)	To tamper cold rollers (50 ton)
Under-zero quench operation tanks	Under-zero quench operations of rollers in min -90°C
Oil tamper furnace (20 ton)	To tamper cold rollers (20 ton)
Roller grinding machines	To grind rollers with 1μm precision (20 ton)
Milling and reaming machines	To machine middle and final steps of cold rollers

TABLE 4: PRODUCTION DIVERSITY IN ASI

Steel group	Standard number
Simple carbon steels and heat operations	ASTM A105, ST52, DIN1.1191, 1.7218, 1.6582, 1.7225, A694
Hardened steels	DIN1.7131, 1.5920, 1.5919, 1.5752, 1.7147, 1.7149
High temperature resisting steels	DIN1.7335, 1.8070, 1.7258
Cold-operation tool steels	DIN1.2436, 1.2379, 1.2080, 1.2767, 1.2510, 1.2550
Hot-operation tool steels	DIN1.2367, 1.2365, 1.2344, 1.2567, 1.2714, 1.2716
Carbon tool steels	DIN1.1730, 1.1740, 1.1525, 1.1545, 1.1645
Spring steels	DIN1.1248, 1.8159
Plastic mold steels	DIN1.2312, 1.2083, 1.2311
Stainless steels	DIN1.4006, 1.4012, 1.4057, 1.4301, 1.4401, 1.4404
Fireproof steels	DIN1.4841, 1.4828
Fast-cut steels	DIN1.3207, 1.3255, 1.3343

Production diversity in ASI is so that minimum production is 10-15 ton, and it reaches to 30 ton for some steels such as stainless steels that need melting support.

One of the most diverse parameters in ASI is physical size (table 5).

TABLE 5: DIVERSITY OF PHYSICAL SIZE

Section shape	Dimensions
Round and stair	80-100 mm
Square	80×80 to 100×100 mm
Flat	60×140 to 400×1800 mm
Ring	Inside min 350 and outside max 3400 mm
Cylinder	Inside min 200 and outside max 1300 mm
Disc	Max 2000 mm
Shapeless	Max 40 ton

C) QUESTIONNAIRE

The questionnaire contained 24 questions by Likert 5-option scale (very low, low, medium, high, very high). To complete the questionnaire, the researcher has went to the offices of managers and experts. These persons were familiar with financial affairs and ASI. Then Excel and SPSS were used to analyze data.

VALIDITY AND RELIABILITY OF MEASUREMENT TOOLS

The views of experts were used to increase validity of research tools (library, interview, questionnaire). Reliability of test was measured by Cronbach's Alpha, which was equal to 0.79625 that shows suitable reliability. The best reliability is >0.70 .

STATISTICAL METHOD

Statistical methods were used in two methods:

a) **Descriptive statistics:** This method merely describes society and its goal is calculation of society parameters. If values and indices are calculated by counting all elements of a society, it is called "descriptive statistics". Descriptive statistics indices are: table, average, dispersion, SD, etc.

b) **Statistical inference:** Here we suggest a special kind of statistical inference called "statistical hypothesis tests". In this research, statistical hypothesis test is:

$\mu>3$: H0 is confirmed

$\mu\leq3$: H1 is rejected

T Test was used to examine data and statistical sample. In this research, Lickert Test (very high (5), high (4), medium (3), low (2), very low (1)) was used to estimate μ . So, the assumption is confirmed by confidence interval of 95% (α=5%; significance level<5%). If upper and lower limits are positive in 95% confidence interval and the statistic is not negative, then the assumption is evaluated higher than average.

If H1 is confirmed, it indicates that ABCS is applicable in ASI. If H0 is confirmed, it indicates that ABCS is not applicable in ASI.

ANALYSIS OF ASSUMPTIONS

$\mu>3$: H0 = There is an effective factor on ABCS in ASI.

$\mu\leq3$: H1 = There is no effective factor on ABCS in ASI.

Table 6 shows descriptive statistics indices for effective factors on implementation of ABCS. The average value for 50 samples is > 4 and SD is max 0.81117. As table 7 shows, α=5% (significance level<5%), then H0 is confirmed.

TABLE 6: DESCRIPTIVE STATISTICS INDICES

	N	Mean	SD	Std. Error Mean
Sub-main assumption 1	50	4.7	0.38244	0.05408
Sub-main assumption 2	50	4.61	0.24826	0.03511
Sub-main assumption 3	50	4.0667	0.76190	0.10775
Sub-main assumption 4	50	4.46	0.73183	0.10308
Sub-main assumption 5	50	4.1933	0.81117	0.11472
Sub-main assumption 6	50	4.5	0.31044	0.04390
Sub-main assumption 7	50	4.74	0.35341	0.04998
Sub-main assumption 8	50	4.4667	0.26937	0.03810

Table 7 shows output of SPSS software for single-sample T Test.

TABLE 7: SINGLE-SAMPLE T TEST

Test value = 3						
Sub-main assumptions	T	df	Sig.	Mean difference	95% confidence interval	
					Lower	Upper
Sub-main assumption 1	31.432	49	0	1.7	1.5913	1.8287
Sub-main assumption 2	45.857	49	0	1.61	1.5394	1.6806
Sub-main assumption 3	9.899	49	0	1.06667	0.8501	1.3832
Sub-main assumption 4	14.302	49	0	1.46	1.3549	1.6651
Sub-main assumption 5	10.403	49	0	1.19333	0.9638	1.4339
Sub-main assumption 6	34.167	49	0	1.5	1.4118	1.5882
Sub-main assumption 7	34.814	49	0	1.74	1.6396	1.8404
Sub-main assumption 8	38.5	49	0	1.46667	1.3901	1.5432

As you see in table 7, upper and lower limits in confidence interval of 95% are positive and T statistic is positive, too. This shows that the views of respondents for the effective factors on implementation of ABCS are higher than the average. Thus H0 is confirmed and H1 is rejected. So, there are effective factors on implementation of ABCS in ASI.

CONCLUSION

Regarding to the results, we conclude that there are effective factors on implementation of ABCS in ASI. Therefore, implementation of ABCS in ASI is feasible. Excess changes in economics o alloy steel have changed its conditions significantly. International competence and rapid new technologies have encountered this industry with major modifications. Thus, management accounting is changing beside changes of production systems. Usage of modern costing management in this industry increases its competitive power and provides conditions to produce more qualitative and cheaper products. ABCS can provide better information for decisions and helps diagnosis of none value-added costs. ABCS helps managers to understand capital cost and investment better. It also helps managers not to decide by after-tax profit, but follow long term programs and improve capital resources by considering economic efficiency. However, this system will not improve activities of a company automatically, but it provides information affecting efforts of managers to improve their companies.

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AN IMPACT OF SERVICE QUALITY ON LOYAL CUSTOMER AND ITS SATISFACTION: A STUDY OF PRIVATE BANKS IN KANPUR CITY (INDIA)

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ABSTRACT

Service quality has a significant impact on a bank's success and performance. In Indian banking industry, customers perceive very little difference in the banking products offered by banks dealing in services as any new offering is quickly matched by competitors. The major aim of the research paper is to evaluate the impact of service quality on customer loyalty among private bank customers in Kanpur city, Uttar-Pradesh with customer satisfaction mediating these variables. The findings show that improvement in service quality can enhance customer loyalty. The service quality dimensions that play a significant role in this equation are reliability, empathy, and assurance. The findings indicate that the overall respondents evaluate the bank positively, but still there are rooms for improvements. The five dimensions of SERVPERF model i.e. reliability, assurance, tangibility, empathy and responsiveness were used to measure the quality of service offered by the private banks. In order to achieve the aims, both primary and secondary sources of data were used. The primary data were collected through structured questionnaire. In this study, the research design will be Descriptive Research Design. The research findings indicate offering high quality service increase customer satisfaction, which in turn leads to high level of customer commitment and loyalty.

KEYWORDS

Customer Satisfaction, Indian private banking, Loyalty, SERVQUAL, and SERVPERF.

INTRODUCTION

India was a latecomer to economic reforms, embarking on the process in earnest only in 1991, in the wake of an exceptionally severe balance of payments crisis. The economic liberalization of the financial sector started in 1991 laid a foundation for the formation and expansion of banks in India. This coupled with rapid technological advancement and improved communication systems, have contributed to the increasing integration and resemblance amongst banks in the financial sector. As a result, Indian banks are now faced with very high and intense competition (Harvey, 2010).

Banks operating in India is consequently put into lot of pressures due towards increase in competition. Various strategies are formulated to retain the customer and the key of it is to increase the service quality level. Service quality is particularly essential in the banking services context because it provides high level of customer satisfaction, and hence it becomes a key to competitive advantage (Ahmossawi, 2001). In addition, service quality has a significant impact on a bank's success and performance (Mouawad and Kleiner 1996). Nowadays, service quality has received much attention because of its obvious relationship with costs, financial performance, customer satisfaction, and customer retention.

Different meaning could be attached to the word quality under different circumstances. It has been defined in a different way by various bank professionals and research scholars. Some of the prominent definitions include "Quality is predictability" (Deming, 1982), "conformance to specification or requirements" (Crosby, 1984), "fitness for use" (Juran, 1988) and "customer's opinion" (Feigenbaum, 1945), "Quality is like a Human value" (Kushwaha R.K & Mandal. D,2013). These initial efforts in defining quality originated largely from the Banking sector. A solid foundation in defining and measuring service quality was emanated in the mid eighties by Gronroos (1984) and Parasuraman et al.(1985).

TABLE 1: STUDIES CONDUCTED BY ADOPTING SERVPERF

Authors	Country
Beerli et. al (2004)	Spain
Wang et. al (2003)	China
Lee and Hwan (2005)	Taiwan
Zahoor (2011)	Pakistan
Mensah (2010)	Ghana
Sulieman (2011)	Jordan

They were amongst the earliest scholars laid down the foundation for the definitions as well as development of service quality. Defining service quality is difficult as compared to product quality due to some features unique to services including intangibility, inseparability, heterogeneity and pershability (Chang and Yeh, 2002). In presence of these limitations, Parasuraman come up with a comprehensive way of defining service quality.

REVIEW OF LITERATURE

SERVICE QUALITY

Service quality is a concept that has aroused considerable interest and debate in the research literature because of the difficulties in both defining it and measuring it with no overall consensus emerging on either (Wisniewski, 2001). There are a number of different "definitions" as to what is meant by service quality. One that is commonly used defines service quality as the extent to which a service meets customers' needs or expectations (Lewis and Mitchell, 1990; Dotchin and Oakland, 1994a; Asubonteng et al., 1996; Wisniewski and Donnelly, 1996). Service quality can thus be defined as the difference between customer expectations of service and perceived service.

If expectations are greater than performance, then perceived quality is less than satisfactory and hence customer dissatisfaction occurs (Parasuraman et al., 1985; Lewis and Mitchell, 1990). Always there exists an important question: why should service quality be measured? Measurement allows for comparison before and after changes, for the location of quality related problems and for the establishment of clear standards for service delivery. Edvardsen et al. (1994) state that in their experience, the starting point in developing quality in services is analysis and measurement. The SERVQUAL approach, which is studied in this paper, is the most common method for measuring service quality.

CUSTOMER SATISFACTION

Early concepts of satisfaction research have defined satisfaction as a post choice evaluative judgment concerning a specific purchase decision (Churchill and Sauprenant 1992; Oliver 1980). Most researchers agree that satisfaction is an attitude or evaluation that is formed by the customer comparing their pre-purchase expectations of what they would receive from the product to their subjective perceptions of the performance they actually did receive (Oliver,1980). Further, "Satisfaction is a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations". (Kotler, 2000, p.36).Customer satisfaction is a collective outcome of perception, evaluation and psychological reactions to the consumption experience with product/service. (Yi,1990).

SERVICE QUALITY AND CUSTOMER SATISFACTION

Kotler and Armstrong (2012) preach that satisfaction is the pos-purchase evaluation of products or services taking into consideration the expectations. Researchers are divided over the antecedents of service quality and satisfaction. Whilst some believe service quality leads to satisfaction, others think otherwise (Ting, 2004). The studies of Lee et al. (2000); Gilbert and Veloutsou (2006); Sulieman (2011) and Buttle (1996) suggest service quality leads to customer satisfaction. To achieve a high level of customer satisfaction, most researchers suggest that a high level of service quality should be delivered by the service provider as service quality is normally considered an antecedent of customer satisfaction. As service quality improves, the probability of customer satisfaction increases. Quality was only one of many dimensions on which satisfaction was based; satisfaction was also one potential influence on future quality perceptions (Clemes, 2008). Service quality is an important tool to measure customer satisfaction (Hazlina et al., 2011). Empirical studies show that the quality of service offered is related to overall satisfaction of the customer. According to Jamal and Anastasiadou (2009), reliability, tangibility and empathy positively related with customer satisfaction. Sulieman (2011) found that reliability, tangibility, responsiveness and assurance have significant and positive relationship with customer satisfaction. Meanwhile empathy was found to have a significant and negative effect on customer satisfaction. Moreover, the result of Ravichandran et. al (2010) indicates responsiveness is the only significant dimension of service quality that affects the satisfaction of customers positively.

CUSTOMER SATISFACTION AND LOYALTY

Both the service management and the marketing literatures suggest that there is a strong theoretical foundation for an empirical exploration of the linkages between customer satisfaction and customer loyalty. According to these literatures, customer satisfaction with the service experience will lead to higher level of customer loyalty. Horstmann (1998), states that there is a strong and positive relationship between customer satisfaction and loyalty. A satisfied customer is six times more likely to repurchase a product and share his experience with five or six other people (Gronroos, 2000; Zairi, 2000); further unsatisfied customer can banish more business from the organization than ten highly satisfied customers do (Mohsan, 2011). With higher customer satisfaction the level of loyalty increases Tee et al. (2012) found a significant positive relationship between customer satisfaction and customer loyalty. Other several studies have indeed found satisfaction to be a leading factor in determining loyalty (Sit et al., 2009; Mensah, 2010; He and Song, 2009). These studies have concluded that there is a significant relationship between customer satisfaction and loyalty. They assert that high level of customer satisfaction will result in increased loyalty for the firm and is positively associated with repurchase intentions, positive words of mouth and profitability. On the basis of the above empirical literatures, customer satisfaction is indicated as a foremost determinant of customer loyalty.

In Indian banking industry, customers perceive very little difference in the banking products offered by banks dealing in services as any new offering is quickly matched by competitors. There are disappointments of customers over the service offered and the available services don't match with the expectation of the customer. This study addresses all these issues and tries o indentify the dimension of quality which achieved least together with its implication on customer satisfaction and loyalty.

SERVQUAL METHODOLOGY

Clearly, from a Best Value perspective the measurement of service quality in the service sector should take into account customer expectations of service as well as perceptions of service. However, as Robinson (1999) concludes: "It is apparent that there is little consensus of opinion and much disagreement about how to measure service quality". One service quality measurement model that has been extensively applied is the SERVQUAL model developed by Parasuraman et al. (1985, 1986, 1988, 1991, 1993, 1994; Zeithaml et al., 1990). SERVQUAL as the most often used approach for measuring service quality has been to compare customers' expectations before a service encounter and their perceptions of the actual service delivered (Gronroos, 1982; Lewis and Booms, 1983; Parasuraman et al., 1985). The SERVQUAL instrument has been the predominant method used to measure consumers' perceptions of service quality. It has five generic dimensions or factors and is stated as follows (van Iwaarden et al., 2003):

1. Tangibles:-Physical facilities, equipment and appearance of personnel.
2. Reliability:-Ability to perform the promised service dependably and accurately.
3. Responsiveness:- Willingness to help customers and provide prompt service.
4. Assurance (including competence, courtesy, credibility and security):- Knowledge and courtesy of employees and their ability to inspire trust and confidence.
5. Empathy (including access, communication, understanding the customer):-Caring and individualized attention that the firm provides to its customers.

In the SERVQUAL instrument, 22 statements measure the performance across these five dimensions, using a seven point likert scale measuring both customer expectations and perceptions (Gabbie and O'neill, 1996). In making these measurements, respondents asked to indicate their degree of agreement with certain statements on liker type scale. For each item, a gap score (G) is then calculated as the difference between the perception score (P) and the expectation score (E). The greater the gap scores the higher the score for perceived service quality. It is important to note that without adequate information on both the quality of services expected and perceptions of services received then feedback from customer surveys can be highly misleading from both a policy and an operational perspective.

The SERVPERF model was carved out of SERVQUAL by Cronin and Taylor in 1992. SERVPERF measures service quality by using the perceptions of customers. Cronin and Taylor argued that only perception was sufficient for measuring service quality and therefore expectations should not be included as suggested by SERVQUAL (Baumann et al, 2007). The SERVPERF scale is found to be superior not only as the efficient scale but also more efficient in reducing the number of items to be measured by 50% (Hartline and Ferrell, 1996; Babakus and Boller, 1992; Bolton and Drew, 1991). In this study, the SERVPERF scale is used to measure to service quality in retail banking. Many studies have been conducted by adopting the SERVPERF model; some of the most relevant are given in Table 1.

OBJECTIVES OF THE STUDY

- To evaluate the impact of service quality on customer loyalty among private bank customers in Kanpur city.
- To measure the quality of service offered by private banks operating in Kanpur city.
- To investigate the relationship between service quality, customer satisfaction and loyalty.

HYPOTHESIS

Tangibles have been defined as physical facilities, equipment and appearance of personnel (Parasuraman et al., 1988). Issues related o the branches such as access to the facilities, safety and convenience are on tangible basis (Castro, 1997 as cited by Bellini et al., 2005). Thus, the following hypotheses are proposed:

H1a. Tangibles will have positive effect on customer loyalty.

H1b. Tangibles will have positive effect on customer satisfaction.

Parasuraman et al. (1988) defined reliability as the ability to perform the promised service dependably and accurately. Nguyen & Leblanc (2001) consider reliability as reputation that can be the most reliable indicator of service quality which could be related to customers past experiences (Ndub isi, 2006). As such, the following are hypothesized:

H2a. Reliability will have positive effect on customer loyalty.

H2b Reliability will have positive effect on customer satisfaction.

According to Parasuraman et al. (1988), responsiveness is willingness to help customers and provide prompt service. Responsiveness is likely to have an impor tant and positive effect on customer satisfaction (Jun & Cai, 2001; Diaz & Ruiz, 2002; Joseph et al., 2005; Glaveli et al., 2006). Therefore, the fo llowing are hypothesized:

H3a. Responsiveness will have positive effect on customer loyalty.

H3b. Responsiveness will have positive effect on customer satisfaction.

Parasuraman et al. (1988) defined empathy as the caring, individualized attention the firm provides for its customers. Empathy is proved to be influential in customer loyalty (Butcher, 2001; Ndubisi, 2006; Ehigie, 2006). Thus, the followings are hypothesized:

H4a. Empathy will have positive effect on customer loyalty.

H4b. Empathy will have positive effect on customer satisfaction.

Parasuraman et al. (1988) defined assurance the knowledge and courtesy of employees and their ability to inspire trust and confidence. Several studies suggest that the exchange of information is an important part of both traditional selling and relationship marketing which may lead to a shared understanding (Ndubisi, 2006; Lymperopoulos et al., 2006). Therefore, the following hypotheses are proposed:

H5a. Assurance will have positive effect on customer loyalty.

H5b. Assurance will have positive effect on customer satisfaction.

H6a. There is relationship between service quality and customer satisfaction in banking services.

H6b. There is relationship between customer satisfactions and loyalty in banking services.

RESEARCH METHODOLOGY

RESEARCH DESIGN

Research Design is a map or blueprint according to which the research is to be conducted. In the present study, the research design will be **Descriptive Research Design**. Descriptive research includes survey and fact finding enquiries. The research design specifies the method of data collection and data analysis.

DATA COLLECTION METHOD

A research design is an arrangement of conditions for collection and analysis of Data in a manner that aims to combine relevance to the research purpose with Economy in procedure. It constitutes the blueprint for collection, measurement and analysis of data.

a) Primary data: These are those data which are collected afresh and for the first time, and thus happen to be original in character. We will be using the structured questioners.

b) Secondary data: These are those which have already been collected by someone else and which have already been passed through the statistical process. We will collect it from the sources like internet, published data etc.

SAMPLING PLAN

SAMPLING TECHNIQUE

First step in sampling plan is to decide the Sampling Technique, Universe or Population.

We will be going to choose the sample according to the "**Convenience Sampling**". Once the universe is decided the researcher must concern himself to find:

- What sampling unit should be studied?
- What should be the sampling size?
- What sampling procedure should be used?

UNIVERSE

The first step in developing any sample design is to clearly define the set of objects, technically called the universe. In present research, universe will be the ultimate customers of the private banks in Kanpur city (Eastern Uttar-Pradesh).

GEOGRAPHICAL LOCATION

The present research will be conducted in Kanpur city.

SAMPLING UNIT

The basic thing is to be decided in sampling unit who is to be surveyed. In the present study, the sampling units will be the respondents who are the ultimate customer of the banks i.e. All population ranging between the ages of 16 to 50 and above.

SAMPLE SIZE

The second issue is to be decided is 'The Sample Size'. The whole of the universe can't be studied in a single research work. The researcher has to select a relevant fraction of the population or universe. In the present study the sample size will be of 345 Respondents.

DATA ANALYSIS & INTERPRETATION

The results of Table 2 provide data on demographic characteristics of the respondents. It includes variables like age, gender, educational qualifications, and frequency of use. The sample includes 345 customers of Indian private banks. Females make 33% of the customers on the other hand males respondents represented (67%) of the survey population. The largest group of respondents (58%) is aged between 31 and 55. The next largest group (34%) is aged between 16 and 30. Smaller groups of respondents are aged above 50 (8%). With regard to educational level; respondents with SSC and below make 16% of the customers. While first degree holders are the largest group of respondents comprising 69% of the respondents. Finally, holders of postgraduate degrees make 15 of the customers. Regarding the frequency of use, majority of the respondent are not frequent users (51 and 46%); they use the service at most once in a month.

TABLE 2: CHARACTERISTICS OF THE RESPONDENTS

	Frequency	Percentage
1. Gender		
Male	214	67.0
Female	131	33.0
Total	**345**	**100.0**
2. Age		
16-30	133	34.0
31-50	192	58.0
Above 50	20	8.0
Total	**345**	**100.0**
3. Educational Background		
SSC and Below	89	16
Undergraduate	219	69
Postgraduate and above	37	15
Total	**345**	**100.0**
4. Frequency of use		
Daily	0	0
Weekly	8	3
Monthly	163	46
Other	174	51
Total	**345**	**100.0**

Table 3 shows the mean score for the five dimensions of service quality. The highest mean is scored by tangibility followed by assurance and reliability. The least mean score is for empathy followed by responsiveness.

According Table 3, the tangibility dimension of service quality is carried out superior to the other four dimensions with a mean score of 3.50. This indicates the private banks are performing at satisfactory level in possessing good looking equipments, visually appealing materials and neat appearing employees. The second dimension as per the rating of the customers is assurance with a mean score of 3.18. The customer perceived that the banks are performing better in having knowledgeable and courteous employees and providing secure and trustworthy service. The third dimension is reliability with 3.10 mean score. The least performed dimensions are responsiveness and empathy with a mean score of 2.73 and 2.71 respectively. As per the response of the customers, private banks are not good in delivering responsive and empathic service. This indicates that there are weaknesses in helping customers, responding to customer inquiries, delivering prompt service and understanding individual customer needs.

TABLE 3: MEAN SCARE FOR SERVICE QUALITY DIMENSIONS

Service quality dimensions	Mean score	Standard deviation
Tangibility	3.5000	0.53967
Reliability	3.1000	0.74598
Responsiveness	2.7250	0.55327
Assurance	3.1850	0.65603
Empathy	2.7050	0.55132

According to the Table 4, there is a significant positive relationship between the five dimensions of service quality and customer satisfaction, the highest correlation is between empathy and customer satisfaction (0.986); followed by responsiveness (0.918), tangibility (0.898) and assurance (0.896) respectively. The weakest correlation is between reliability and customer satisfaction (0.742). Because the correlation was positive, service quality and customer satisfaction is positively related, which means the better service quality was the higher customer satisfaction. Accordingly, the most important service quality dimension that affects customer satisfaction is empathy, which goes to prove that empathy perceived as a dominant service quality followed by responsiveness; indicating improvements in employees' customer satisfaction levels were significant.

TABLE 4: CORRELATIONS RESULTS OF SERVICE QUALITY AND CUSTOMER SATISFACTION

Variables	Customer satisfaction	Tangibility	Reliability	Responsiveness	Assurance
Tangibility	0.898	----------	----------	----------	----------
Reliability	0.742	0.776	----------	----------	----------
Responsiveness	0.918	0.679	0.482	----------	----------
Assurance	0.896	0.725	0.801	0.783	----------
Empathy	0.986	0.748	0.787	0.768	0.823

Table 5 indicates empathy, responsiveness and assurance dimension of service quality have a significant influence on customers' satisfaction at 95% confidence level. Conversely, reliability and tangibles dimension have no significant influence on customers' satisfaction. The significant service quality factors have been included for the establishment of the function. The established regression function is:

Z = - 0.115 + 0.052X1 + 0.039X2 + 0.166X3 + 0.145X4 + 0.721X5

TABLE 5: REGRESSION RESULTS OF SERVICE QUALITY AND CUSTOMER SATISFACTION

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	-0.115	0.079	--------	1.457	0.219
Tangibility	0.052	0.023	0.052	2.245	0.0088
Reliability	0.039	0.074	0.038	0.792	0.473
Responsiveness	0.166	0.145	0.155	1.143	0.017
Assurance	0.145	0.048	0.143	3.019	0.039
Empathy	0.721	0.153	0.730	4.712	0.009
Adjusted R square	0.907				
F: 18.566*					

The regression results indicate all the service quality dimensions (tangibility, reliability, responsiveness, assurance and empathy) combined significantly influence the satisfaction of customers. The adjusted R2 of 0.907 indicates 90.7% of the variance in customer satisfaction can be predicted by the service quality offered by the private banks (Table 6). According Mcllroy and Barnett (2000) an important factor to be considered when developing a customer loyalty program is customer satisfaction. Satisfaction is a critical scale of how well customers' needs and demands are met while customer loyalty is a measure of how likely a customer is to repeat the purchases and engage in relationship activities.

TABLE 6: REGRESSION RESULTS OF CUSTOMER SATISFACTION AND LOYALTY

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	2.047	0.341	-------- -	5.998	0.000
Satisfaction	0.446	0.113	0.814	3.964	0.004
Adjusted R square	0.620				
F: 15.713*					

The above table displays the relationship between customers satisfaction with their loyalty to the bank. In order to test the relationship, linear regression is used. The overall satisfaction of customers seems to have statistically significant and positive effect on their loyalty. The adjusted R2 of 0.62 indicates 62% of customer satisfaction is associated with their loyalty. This indicates customer satisfaction plays an important role in enhancing customer loyalty in Ethiopian private banks the area where banks need to work in order to improve customer perception of service quality. Counter staff need to be continuously trained with proper skill of providing caring and prompt service. Moreover, staff that are committed in implementing quality services and gained recognitions from customers should be given better rewards.

The results of this study shows all service quality dimensions are positively correlated with customer satisfaction indicating quality banking service as a prerequisite for establishing and having a satisfied customers. According to the correlation result, empathy and responsiveness are the dominant determinants of customer satisfaction. This indicates that banks required initializing provision of caring, individualized attention given to the customers. Moreover, managers should encourage service recovery and problem solving attitude prevailing in their banks. The positive significant coefficient for customer satisfaction and loyalty relationship suggests higher customer satisfaction on banking service and the higher the loyalty of customers towards the banks. Thus, satisfied customer is important in developing a loyal customer. Therefore organizations should always strive to ensure that their customers are very satisfied. Customer loyalty and retention is potentially one of the most powerful weapons that financial institutions of can employ in their fight to gain a strategic advantage and survive in today's ever-increasing competitive environment. Moreover, banks need to develop strategies that enhance loyalty of their customers.

DISCUSSION & SCOPE OF THE STUDY

In order to assess the service quality performance, the five dimensions of service quality were used. Among the five dimensions, the banks were found to be superior in providing appealing service environment. The banks are good in tangibility, reliability and assurance dimensions. The mean score values are lowest for responsiveness and empathy indicating inferior performance of these banks in those dimensions of service quality. These are the area where banks need to work in order to improve customer perception of service quality. Counter staff need to be continuously trained with proper skill of providing caring and prompt service. Moreover, staff that are committed in implementing quality services and gained recognitions from customers should be given better rewards. The results of this study shows all service quality dimensions are positively correlated with customer satisfaction indicating quality banking service as a prerequisite for establishing and having a satisfied customers. According to the correlation result, empathy and responsiveness are the dominant determinants of customer satisfaction. This indicates that banks required initializing provision of caring, individualized attention given to the customers. Moreover, managers should encourage service recovery and problem solving attitude prevailing in their banks. The positive significant coefficient for customer satisfaction and loyalty relationship suggests higher customer satisfaction on banking service and the higher the loyalty of customers towards the banks. Thus, satisfied customer is important in developing a loyal customer. Therefore organizations should always strive to ensure that their customers are very satisfied. Customer loyalty and retention is potentially one of the most powerful weapons that financial institutions of can employ in their fight to gain a strategic advantage and survive in today's ever-increasing competitive environment. Moreover, banks need to develop strategies that enhance loyalty of their customers.

CONCLUSION

The main aim of the study was to assess the service quality of private banks and its impact on customer satisfaction. The study also tried to test the relationship that exists between customer satisfaction and their loyalty. The mean score values for service quality dimensions was between 2.6 and 3.4. This indicates that improvements of service quality should be conducted on all the five service quality dimensions, especially the dimensions of responsiveness and empathy. This study also found a positive relationship between all service quality dimensions and customer satisfaction. Accordingly, the results of this research paper confirmed the theory of literatures regarding the relationship between service quality dimensions and customer satisfaction. Although this research provides some significant insights into service quality in Indian banking industry, there is still a chance to extend the findings to gain a more comprehensive understanding of the nature of banking services. The future research may highlight the service quality in banking in total, comparative

analysis on SERVPERF scores in different types of banks and comparative analysis on SERVQUAL and SERVPERF scores in banking industry. The future research may be directed to analyze the application of SERPERF to other service industries by incorporating other dimensions of service quality.

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A STUDY ON EMPLOYEE PERFORMANCE APPRAISAL IN CEMENT INDUSTRY IN TAMILNADU

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ABSTRACT

Performance appraisal is one of the most complex and controversial human resource techniques. As far as appraisal is concerned, both organisation and employees have their own viewpoint. From the employee viewpoint, he comes to know the organisation's expectations, his past performance, ways to improve the current performance and even gets reward or recognition of his good work. Looking from the organisation's side one of the most important reasons for having a system of performance appraisal is to establish and uphold the principle of accountability. Every organisation is having an objective towards optimum performance and the employees are the key in achieving that. It is necessary that the employee's performance should reach optimality for the success of the organisation. The present paper focuses on importance of employee performance appraisal. An attempt has been made to study the methods of performance appraisal used in sample unit. Last part of the paper reveals the suggestions.

KEYWORDS
Organizations Expectations, Performance Appraisal, Optimum Performance, Methods of Performance Appraisal.

INTRODUCTION

Indian Cement industry is currently ranked second in the world behind China. Cement industry in India is on a roll at the moment driven by a booming real estate sector, global demand and increased activity in infrastructure development such as state and national highways. Production capacity has gone up and top cement companies of the world are trying to enter the Indian market. As various infrastructure projects road network and housing project are coming up many of which are backed by the government. The Indian cement industry is truly big in size and hence accommodates a number of cement companies in the market.

Human Resource Development is the basis of success of any organisation. HRD helps to enhance employee's effectiveness and helps to achieve organizational goals. Performance appraisal can be defined as "the process of evaluating the performance of an employee and communicating the result of the evaluation to him for the purpose of rewarding and developing the employee". Performance appraisal in the real sense can be carried out only when the employees are provided with the required amount of training. Every organisation now-a-days is using various methods for appraising the performance of the employees, so that the real potential of the human asset can be known and utilized in proper way. Performance appraisal not only evaluates the work done by the employees but also tries to boost the morale and motivate them to do their best.

OBJECTIVES OF THE STUDY

1. To examine the importance of performance appraisal.
2. To study the methods of performance appraisal used in sample unit.
3. To analyse and interpret data.
4. To offer suitable suggestions in the light of the findings.

METHODOLOGY

The present study is based on primary and secondary data. Primary data was collected through well structured questionnaire and secondary data was collected from company's website.

IMPORTANCE OF PERFORMANCE APPRAISAL

1) PERFORMANCE FEEDBACK

Most employees are very interested in knowing how well they are doing at present and how they can do better in future. They want this information to improve their performance in order to get promotions and merit pay. Proper performance feedback can improve the employee's future performance. It also gives him satisfaction and motivation.

2) EMPLOYEE TRAINING AND DEVELOPMENT DECISION

Performance appraisal information is used to find out whether an employee requires additional training and development. Deficiencies in performance may be due to inadequate knowledge or skills. If the performance appraisal results show that he can perform well in a higher position, then he is given training for the higher level position.

3) VALIDATION OF SELECTION PROCESS

Performance appraisal is a means of validating both internal (promotions and transfers) and external (hiring new employees from outside) sources.

4) PROMOTIONS

Performance appraisal is a way of finding out which employee should be given a promotion, past appraisals, together with other background data, will enable management to select proper persons for promotion.

5) TRANSFERS

Performance appraisal is also useful for taking transfer decisions. Transfers often involve changes in job responsibilities such identification of employees who can be transferred is possible through the performance appraisal.

6) COMPENSATION DECISION

Performance appraisal can be used to compensate the employees by increasing their pay and other incentives. The better performance is rewarded with merit pay.

7) LAY OFF DECISIONS

Performance appraisal is a good way of taking lay off decisions. Employees may be asked to lay off, if the need arises. The weakest performers are the first to be laid off.

8) HUMAN RESOURCE PLANNING (HRP)

The appraisal process helps in human resource planning (HRP). Accurate and current appraisal data regarding certain employees helps the management in taking decisions for future employment.

METHODS OF PERFORMANCE APPRAISAL USED

TRADITIONAL METHODS

1. Performance appraisal Assessment
2. Ranking Method
3. Rating scale method
4. Critical incident method
5. Checklist method

MODERN METHODS

1. Management by Objectives
2. Behaviorally anchored Rating Scale

Following are some of the most commonly used traditional methods:

1. **Performance Appraisal Assessment / Self Assessment Method:** The assessment can be accomplished by an individual or by a combination of the immediate superior, other managers acquainted with the assessee's work, a higher level manager, a personnel officer, the assessee himself, and the assessee's subordinates. Therefore, it is a regular part of the company's evaluation process.

2. **Ranking Method:** Ranking method which is commonly used in the unit straight ranking method. Simply ranks the person from the 'most valuable' to the 'least valuable' and is the simplest method of separating the most efficient from the least efficient.

3. **Rating Scale Method:** Ratings are of two types;

1) Graphic rating method aimed at evaluation of personality and qualities of an employee, those are useful for his performance at job. Qualities based on personality characteristics include leadership, industriousness, attitude, creativity, loyalty etc. Whereas other qualities include target, responsibility, quality of worklife, achievement etc.,

2) Second is the Discrete Scale which provides two or more categories in which the rater tick mark the best performer and describes the person being rated. As such scale like good, average, poor and others.

4. **Critical Incident Method:** With the critical incident method, the supervisor maintains a record or log of positive and negative of uncommonly incidents of an employee's work related behavior and reviewing it with the employee at predetermined times. It provides actual examples of good and poor performance of the employees.

5. **Checklist Method:** Under this method a list of statement describing the job related behavior of the employees is given to the evaluation by the subordinate. If the evaluation perceives that the employees possesses a particular trait, the statement is checked and hence, then submitted to the Human Resource Department, where counting of the checks is carried out and performance is assessed.

MODERN METHODS OF PERFORMANCE APPRAISAL

Modern methods are developed by Peter Drucker

1. **Management by Objectives:** As per George Oriorne, the author of the first book with the title management by objectives and the man who popularized MBO in USA, say's "MBO is a system, wherein the superior and the subordinate manager of an organisation jointly define its common goals, define each individual's major areas of responsibility in terms of the result expected of him and use these measures as guides for operating the unit and assessing the contribution of each of its members".

2. **BARs / Behaviourlly Anchored Rating Scale:** This rating scale is prepared by identifying effective as well as ineffective critical area of performance behaviour for getting result and identifies such critical area in knowledge, judgement, human relation, skill organisational, skill of monetary transaction and observational ability.

DATA ANALYSIS AND INTERPRETATION

1. **AGE-WISE DISTRIBUTION OF RESPONDENTS**

16% of respondents fall in the age group of 18-30, 28% of respondents fall in the age group of 31-40, 36% of respondents fall in the age group of 41-50 and further 20% of the respondents fall in the age group of 50 and above.

2. **EDUCATIONAL STATUS OF RESPONDENTS**

46% of the respondents have completed matric and 24% have completed their under-graduation, 10% of respondents have completed Graduate and 04% of respondents have completed Post-graduation and rest 16% of respondents have obtained professional qualification like I.T.I., diploma and so on.

3. SERVICE OF RESPONDENTS

20% of respondents were having an experience below 5 years, a very least number i.e., only 4% of respondents are having a service period from 6-10 years, another 12% of respondents fall in the service of 11-15, 64% of respondents were belonging to 16 and above years of experience.

4. NATURE OF SERVICE OF THE RESPONDENTS IN THE CEMENT COMPANY

94% of respondents are permanent and remaining 6% of the respondents are working as a temporary or casual labour. Thus, from the above table it is concluded that the majority of the respondents are working as a permanent employee.

5. PERFORMANCE APPRAISAL METHOD

Clearly understood that self assessment method and ranking method are more regularly used. Whereas, graphic rating scales and management by objectives are the methods which are less used. Hence, to look over the performance of the employees other methods are also used such as behaviorally anchored rating scale, critical incidental method etc. It means that performance appraisal done on regular basis by using different method. This helps the employees to know where they are lagging behind and the kind of knowledge they further need.

SUGGESTIONS

1. Efficient personnel should be selected to appraise performance of the employees and they should be given sufficient training in the methods of appraisal. It is therefore, suggested that the performance of the man should be appraised by two or more persons in order to have objective result.
2. The feedback must be given to the employees at the earliest possible time, so that the employees can overcome the weaknesses and grow with the strength.
3. It has been suggested that behavioural training programme should also be conducted on regular basis. Because knowledge is not enough, behavior at the work is also a base to mark the performance of employees.
4. Methods of helping poor perfomers to improve upon their performance, such as counselling and change of role as well as transfer should be put in place or strengthened, if in existence already.

CONCLUSION

Performance appraisal provides opportunities to develop one's self-awareness, self-exploration and self growth. Participating performance appraisal is an essential component of a fair and ethical evaluation of an employee's performance.

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DETERMINANTS OF MOBILE BANKING TECHNOLOGY ADOPTION OF COMMERCIAL BANKS IN ETHIOPIA

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ABSTRACT

Nowadays, mobile banking technology is one of most important technologies in the banking sector. As a result many banks all over the world are adopting it and taking advantage of the technology. Ethiopia, on the other hand didn't adopt the technology yet. Therefore, this research is conducted to identify the determinants of mobile technology adoption of commercial banks in Ethiopia. Thus, the sampling technique used is complete enumeration whereby all commercial banks are considered. However among the seventeen actively operating banks, two banks could not be accessed. Hence the Information Technology managers and presidents of fifteen commercial banks are considered. Data has been collected from the target respondents using questionnaire and interview and analyzed using descriptive analysis. Accordingly technological and non-technological factors are identified. Technological factors are factors that are directly related with the attributes of the technology to be adopted. Such technological factors that are found to determine commercial banks mobile banking technology adoption in Ethiopia includes relative advantage, compatibility, simplicity, observability and trialability. In addition non-technological factors also determine mobile technology adoption of the Ethiopian commercial banks. They are external in nature; in that they are not directly related with the technology itself. These non-technological factors are economical capability, political issue, societal issues as well as organizational readiness. From the interview with the presidents of the banks, we have also found that the main problems that block banks from adopting mobile banking technology yet is the lateness of National Bank of Ethiopia to enact a law regarding mobile banking technology adoption. Moreover, the intention of commercial banks is determined. The banks expressed that they have intention to adopt mobile banking technology.

KEYWORDS
Mobile Banking, Technology Adoption, Commercial Banks of Ethiopia.

1. RATIONALE

Following the fast growth and development in Ethiopia, the demand for the banking service increased where by the current banks cannot accommodate the demand of the banking service. It is not unusual to look a lengthy waiting queue in commercial banks of Ethiopia. In addition to the complaint of urban customers about the service quality, there are significant numbers of potential customers living in small cities and rural towns who have no access to banking service. When such people need to get banking service, they are expected to move for hours to the larger cities where banks have opened their branches. Most of these small cities and some rural towns have access to telecommunication network and use mobile phone for exchange of information, which leaves an opportunity for banks to use mobile-related technology to address such customers. In this regard, modern technologies like mobile banking technology could have been considered as an alternative to address the above mentioned potential customers, who have no option to get financial service from banks except crossing kilometres to the nearby city.

It is true that the adoption of modern information technologies benefit banks. The researchers OKonoye and his colleagues (Okunoye *et.al.*, 2007) assured that application of Information Technology in banks makes them efficient in their activities. As a result modern technologies (particularly information technologies) are getting increasing acceptance in developing countries (Ghaziri, 1998).

Mobile banking technology is one of the technologies which is very important for developing countries to provide banking service in a cost effective manner. It is a technology that could help banks to increase the existing service quality as well as to expand the service to unbanked areas. But when we see the context of Ethiopia, adoption of information technologies (particularly mobile banking technology) is very low. The reason behind has not yet discovered. Theoretically different factors are attributed to the delay of banks to adopt mobile banking technology. Thus, the actual factors that hinder Ethiopian commercial banks to adopt mobile banking technology need to be investigated. Therefore, this research is concerned with identification of the determinants of mobile banking technology adoptions of Ethiopian commercial banks.

2. LITERATURE

2.1. MOBILE PHONES AND MOBILE BANKING TECHNOLOGY

The term "mobile banking" refers to the use of mobile phones as a channel of offering banking services which includes traditional services such as funds transfer, as well as new services such as online and electronic payments. Hence, mobile banking is defined as doing bank transactions via mobile phone (Mcknight and Chervany, 2001).

Mobile Banking can also be defined as a service provided by the bank that enables users to receive information on their accounts and make monetary payments and transfers to third parties based on orders sent via mobile phone. Transactions can be made to legal or natural persons who have a valid Mobile Payment Reception. The Mobile Bank allows its customers to receive information on account balances of the customer, transactions on the customer's accounts, currency exchange rates and so on (Shammot and Al-Shaikh, 2008).

Mobile banking technology is an application of mobile computing which provides customers with the support needed to be able to banked anywhere, anytime using a mobile handheld device and a mobile service such as text messaging (SMS). Mobile banking removes space and time limitations from banking activities such as checking account balances, or transferring money from one account to another (Shi Yu, 2009).

Collins *et.al*, (2009) in his survey found that financial services are very important for the poor; but not available as much as they should have been addressed. According to him the poor is in far access to formal financial institutions; hence, they are forced to use informal financial institutions which are inflexible and unreliable. About 2.6 billion people in the world do not have access to formal financial services, and yet one billion of them have a mobile phone. Consequently, branchless banking systems should take advantage of increasingly ever-present real-time mobile communications networks to bring banking services into everyday retail stores, thereby alleviating the lack of banking infrastructure in the communities where poor people live and work (Dermish *et. al*., 2012).

2.2. MOBILE BANKING TECHNOLOGY AND BANKS

As a result of industrial revolution and globalization, commercial transactions have been rapidly increased. As a result mobile banking becomes one of the newest approaches to the provision of financial services through wireless network, and gaining increasing acceptance within the banking sector which has been made possible by the widespread adoption of mobile phones even in developing countries (Amila *et. al*., 2008).

More than three billion mobile phones are currently in operation worldwide and fully 70% of the total population of developing countries fall within the coverage of existing cellular networks. Africa is, in this regard, the fastest growing mobile market in the world. The continent's subscriber base grew by 66% in 2005 to 135 million users, compared to growth of just 11% in Western Europe during the same period. Mobile phones work easily, they require minimum investment and training and they can perform a variety of functions. This is a good opportunity to adopt mobile banking technology to expand banking services. Mobile banking technologies are particularly valuable in rural areas where no bank branches exist and where other traditional banking channels, such as ATMs, fixed line telephones and the internet are unavailable. According to the researcher, mobile banking technology in developed economies is just another channel among many others which are competing for consumer acceptance and investor commitment. Most of the population are already happy with the standard banking services, which means there's only a limited need in these markets for mobile banking technology.

But, in Africa and other developing countries mobile banking technology is the most cost effective means of delivering financial services and simplest and economic way of providing access to remittances. In Africa and other developing economies, where “necessity” is the mother of invention, mobile banking can fulfil fundamental needs very quickly, helping to advance technologies and providing major transformational change. For this reason, mobile banking technology will have strategic advantage through its strategic probability of expansion to rural area than other technologies for the fact that a mobile banking technology does not require many infrastructures except availability of mobile network and the rural people can get such service through their mobile phone. Therefore, this provides a long term opportunity for banks to expand the service to rural area so that the technology will be adopted all over the concerned developing nation (Kopicki and Miller, 2008).

2.3. MOBILE BANKING TECHNOLOGY IN TODAY’S BANKING SECTOR

Nowadays the banking industry is changing rapidly. Development of international economic and competitive markets also has affected the banks. Technology is a major force in this environment that led to breaking the geographical, legal and industrial barriers and has created new products and services. In recent years, with growth and development of information technology, all aspects of human life have been radically transformed (Liao and Cheung, 2002). Mobile banking services have fundamentally changed the ways and methods of doing daily activities by bank customers; and banks have also used it not only as a new way to increase customer satisfaction, but also as a model strategy to reduce costs and increase profitability (Lin and Lu, 2001). Meanwhile, mobile banking is one of the main branches of the mobile commerce that has critical and influential role on other areas of the business. Mobile banking is a one payment method that, if applied in an appropriate manner, can greatly reduce the banking costs (Davis *et. al*., 1989).

To survive in the competitive market of modern banking sector, banks need to pay attention to optimal management of necessary costs in using various technologies, and use the best methods to create minimum cost. Use of mobile banking technology reduces the banking costs to a great extent. Besides, it increasingly provides customer satisfaction through easy access to financial transactions at any time and place with the lowest possible tool (just a mobile phone) instead of waiting for hours in banks’ offices to get the required service (Fishbein and Ajzen, 1975).

2.4. ADVANTAGES OF MOBILE BANKING

There are number of reasons that persuaded banks to be in favour of mobile banking technology. The technologies are set to become a crucial part of the total banking services experience for the banks. Also, they have the potential to bring down costs for the bank itself.

According to Michael Ardovino (2007), a major benefit of Mobile banking is banking the “unbanked” who generally can’t afford the cost of formal banking services delivered at big cities that require customers to travel hundreds of miles to get the service.

Similarly as the definition of mobile banking technology generally implies, mobile banking is used to provide banking services using mobile phones. The customers can then check their balance on the phone and authorize the required amounts for payment. The customers can also request for additional information. They can automatically view deposits and withdrawals as they occur and also pre- schedule payments to be made or cheques to be issued. Similarly, one could also request for services like stop cheque or issue of a cheque book over one’s mobile phone. (Hamza *et.al.*, 2011).

More over Marwan *et.al., (2008)* listed out the main advantages of mobile banking technology as low administrative costs, transmission of data at any time, concern with personal contact, increases bank productivity, provides database at any time, monitoring & following reports related to work, easy device to use, enables bank dealing individually according to customers’ needs, provides free of charges services, easy procedures to obtain from bank, problems can be solved in timely manner, high degree of comfort ability, accounts are confidential and e-security.

Because of its importance, mobile banking services is continuing to grow so that economic experts forecast that by 2013, 300 billion transactions worth more than 860 billion dollars will be done through mobile banking (Pavlou, 2003). This is an indication of the possibility of mobile banking technology to expand to vast number of customers. However, knowing how such customers and banks that are expected to adopt the technology perceive the technology is a crucial issue. One of Information Technology an adoption concern, particularly in the field of mobile banking technology, is the intention of the technology adopters to the technology to be adopted (Gefen, 2003). The following section gives a clue on factors affecting technology adoption.

2.5. FACTORS AFFECTION TECHNOLOGY ADOPTION

There are different factors affecting banks intention to adopt a new technology. These factors contribute to the level of expansion of the technology all over the world. Such factors that are reviewed from different empirical studies are categorized in to two to suit them with the Ethiopian context. These are technological factors and non-technological factors.

2.5.1. TECHNNOLOGICAL FACTORS

All nations in the world may not innovate similar technologies at a point of time. Different technologies are innovated in different countries at different time. Thanks to globalization, if one technology innovated in a nation is found to be important to the other part of the world; it will made diffused using various mechanisms. The attitude of the adopters to the technologies is a critical component in encouraging or discouraging diffusion of such technology. As a result dealing with the attitude of such adopters towards the technology to be applied or already adopted technology is quit important. The successfulness of diffusion of innovation is determined by different factors that influence the attitude of such adopters.

As cited by Zemenu (Zemenu[1], 2012), according to Rogers Diffusion of Innovation (DOI) theory, (Rogers, 2003) the successful diffusion of new technologies is determined by five factors namely relative advantage, ease of use (simplicity), compatibility, trialability and observability. Adopter nations (particularly technologically poor countries) used to enjoy and are enjoying from the new technologies by adopting such innovated technologies from the innovators.

Diffusion of Innovation Theory (DOI) helps to know the perception of customers (adopters of the technology) towards the new technology to be adopted. Since there is no bank formally started mobile banking service, the banks themselves are adopters. Hence in this paper the five factors of DOI, which are named as technological factors in this paper, are attributed to banks and used to determine banks' intention through their presidents and IT managers (as presidents and IT mangers are the ultimate decision makers to adopt or not to adopt the technology). These factors are:

- ***Relative advantage*** – that is the degree to which an innovation is supposed to be better than the idea it supersedes. The degree of relative advantage may be measured in economic terms, in social-prestige factors, convenience, and satisfaction are also often important components. It does not matter so much whether an innovation has a great deal of "objective" advantage. What does matter is whether a potential adopter perceives the innovation as advantageous. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be.
- ***Compatibility*** – is the degree to which an innovation is believed to be consistent with the existing values, past experiences, and needs of potential adopters. An idea that is not compatible with the prevalent values and norms of a social system will not be adopted as rapidly as an innovation that is compatible. The adoption of an incompatible innovation often requires the prior adoption of a new value system. The greater the compatibility, the faster is the rate of technology adoption.
- ***Simplicity*** – that is the degree to which an innovation is supposed to be simple to understand and use. Some innovations are readily understood by most members of a social system; others are more complicated and will be adopted more slowly. In general, new ideas that are simpler to understand will be adopted more rapidly than innovations that require the adopter to develop new skills and understandings.
- ***Trialability*** – that is the degree to which an innovation supposed to be experimented on a trial basis before it really convince large majority of the adopters. If the innovation is not tested, it is likely that the innovation will not succeed as expected. If an innovation can be broken down into parts and tried small portions at a time, the innovation has a greater chance for adoption; because an innovation that is trialable represents less uncertainty to the individual who is considering it for adoption.
- ***Observability*** – that is the degree to which the results of an innovation are supposed to be visible to others. The easier for individuals to see the results of an innovation, the more convincing the innovation to be adopted; for the fact that such visibility stimulates peer discussion of a new idea, as friends and neighbours of an adopter ask him or her for innovation-evaluation information about it.

In general, innovations that are perceived by receivers as having greater relative advantage, compatibility, trialability, observability, and less complexity will be adopted more rapidly than other innovations. And these are not the only qualities that affect adoption rates, but past research indicated that they are the most important characteristics of innovations in explaining rate of adoption.

2.5.2. NON-TECHNOLOGICAL FACTORS

The five attributes of Roger's diffusion of innovation theory are concerned only with the attributes of the technology itself. And for this fact they are categorized under technological factors. However, the technological attributes alone are not the elements that determine the adoption of a certain technology. Therefore, other non-technological factors should also be considered. Rogers (2003) also said that the five attributes of the new technologies that are explained in the diffusion of innovation theory are not the only factors affecting technology adoption.

As a result, in this research, Rogers's diffusion of innovation theory is modified in such a way that it can incorporate non technological factors. That is the non-technological factors (particularly from adopter point of view) are tried to be considered for the fact that the adopters situation have an effect on the adoption of the technology.

- ***Organizational Readiness***: organizational readiness is concerned with management commitment, organizational culture, and organizational structure, employees' knowledge and technical skill and related issues of the organization.
- ***Economical Capability***: this variable is seen independent of organizational readiness for the fact that it is very fundamental in adoption of technology. It deals with the issues related to the economical environment of the technology to be adopted that can affect the organization tremendously. Contextually Economic capability refers to the Economical maturity of the organization to adopt the technology. It refers to view of the technology from economical benefit and loss perspective
- ***Social issue***: social issue is Banks' perception of societal attitude towards mobile banking technology. It focuses on people's attitudes and beliefs (as viewed by the banks) and is closely linked to the demand and supply of the organization. It is the banks' perception of customers' attitude towards the technology to be adopted.
- ***Political issue***: deal with policies and actions created by government bodies which affect the way in which organizations carry out daily activities. Legislation may hamper an organization in several ways thus it needs to be closely examined. Other issues to be examined under the political frame are tax regimes and fiscal policy.

1.5. RESEARCH OBJECTIVES

- Determining the intention of banks towards mobile banking technologies.
- Identifying technological factors affecting the mobile banking technology adoption of Ethiopian commercial banks.
- Identifying non-technological factors affecting mobile banking technology adoption of commercial banks of Ethiopia.

2. METHODOLOGY

2.1. POPULATION, SAMPLING TECHNIQUE AND SAMPLE SIZE

The target populations of this study are all public and private commercial banks operating in Ethiopia. The national bank and development banks of Ethiopia are not considered in that the service in commercial banks and in national or developmental banks has difference and might lead to inappropriate finding. Furthermore, the need of development banks and national banks to mobile banking technology is not series issue compared to commercial banks.

The sampling technique used is complete enumeration where all selected banks' IT managers and presidents are part of the study. There are seventeen commercial banks in Ethiopia when this research is conducted. Among these banks Berhan International Bank and Zemen Bank didn't provide response to the questionnaire. Consequently the sample size holds fifteen concerned banks' managers (i.e. fifteen IT managers and another fifteen presidents from fifteen commercial banks). Banks have an IT manager per bank who is concerned with management of IT related activities.

2.2. DATA TYPE, SOURCE AND DATA COLLECTION TECHNIQUES:

Only primary data is used in this study. The data is collected from the IT managers as well as presidents of the banks. Questionnaires was developed and distributed to collect primary data from the IT managers and presidents of the banks. The questions include closed ended questions. Furthermore, semi-structured interview is used to collect further information from the presidents.

[1] **Remark:** In his previous research, Zemenu had shown that United Bank S.C. and Dashen Bank S.C. have adopted mobile banking technology. This was because of inflated information gathered from the branch offices. According to data collected from the head offices of commercial banks while conducting this research, it is discovered that the banks didn't formally adopt mobile banking technology yet. Therefore, readers of the previous research need to take this new finding in to consideration for the above mentioned banks didn't adopt mobile banking technology in 2011.

2.3. DATA PROCESSING AND ANALYSIS

First, the data collected through questionnaire is edited and coded. The questions are developed in the form of five rating likert scale that ranges from 1, which represents strongly disagree, to 5 that represents strongly agree. Hence we have used simple descriptive analysis using percentage of frequencies provided to each of the scales. Moreover, simple correlation is used to know the correlation between intention of banks with technological and non-technological factors.

2.4. PERIOD OF THE STUDY: the study was conducted from March 2012 to December 2012.

3. FINDINGS

3.1. INTENTION OF BANKS TOWARDS ADOPTION OF MOBILE BANKING TECHNOLOGY

A questionnaire that has binary response was distributed to all the target banks' IT managers and presidents. All IT managers and banks' presidents of sample banks respond that the bank at which they are managing have intention to adopt mobile banking technology. Hence we can say that the Ethiopian commercial banks have understood the use of mobile banking technology and, hence, have intention to adopt the technology.

3.2. FACTORS AFFECTING MOBILE BANKING TECHNOLOGY ADOPTION

Researchers found different variables that contribute to the technology adoption in their studies. Such empirical studies are used as reference to know what variables affect mobile banking technology adoption. Therefore, in this regard, the researchers have used such variables as bench mark to assure whether such variables determine adoption of mobile banking technology of Ethiopian commercial banks.

3.2.1. TECHNOLOGICAL FACTORS AFFECTING MOBILE BANKING TECHNOLOGY

Technological factors are factors that are directly related to the attributes of the technology to be adopted. These factors explain the characteristics of the technology based on the variables that are to be measured from point of view of adopters. Different questions are asked to know the IT managers and presidents' perception towards each of the variables. The questions were constructed based on five rating likert scale that ranges from strongly agree (SAGR) to strongly disagree (SDIS). The following table shows the banks' IT managers and Presidents perception regarding technological variables, which will determine the banks' perception towards the variables. The abbreviations AGR, NTR and DIS are abbreviations of agree, neutral and disagree respectively.

TABLE 1: BANKS' PRESIDENTS' AND IT MANAGERS' PERCEPTION OF TECHNOLOGICAL FACTORS

Variables	SAGR	percent	AGR	percent	NTR	percent	DIS	percent	SDIS	percent	Total	percent
Relative Advantage	11	36.67%	18	60.00%	1	3.33%	-	-	-	-	**30**	**100%**
Compatibility	13	43.33%	14	46.67%	3	10.00%	-	-	-	-	**30**	**100%**
Simplicity	0	0.00%	20	66.67%	10	33.33%	-	-	-	-	**30**	**100%**
Observability	13	43.33%	15	50.00%	2	6.67%	-	-	-	-	**30**	**100%**
Trialability	3	10.00%	20	66.67%	7	23.33%	-	-	-	-	**30**	**100%**

Source: primary data (2012)

The above table shows respondents response towards the technological factors. Relative advantage is the a variable that is used to represent banks' IT managers/presidents perception on relative advantage of mobile banking technology compared to the traditional banking service delivery system. Accordingly 36.7% of the banks IT managers and presidents have strongly agreed that mobile banking technology has a relative advantage and the rest 60% have also agreed that the technology has, in fact, relative advantage. Only 3.33% of respondents are indifferent regarding the mobile banking technology's relative advantage. So, we can say that most respondents have high perception that mobile banking technology has relative advantage compared to the traditional banking service system.

Regarding the compatibility of mobile banking technology, 43.33% of respondents have strongly agreed that the technology has no difficulty of compatibility with culture, local language, living styles and other values of the community. 46.67% of respondents also agreed with compatibility of mobile banking technology. On the other hand 10% of them are indifferent about compatibility of the technology. Hence we can say that 90% of the total respondents perceived that mobile banking technology is compatible.

Simplicity of the technology is the other concern of technology adoption. In this case, although 66.67% of the total respondents said that they agree on simplicity of the technology, they seem to doubt on its simplicity; because, no participant has responded 'strongly agreed' on simplicity of the technology and the rest 33.33% of total respondents are indifferent regarding simplicity of mobile banking technology. IT managers and presidents of banks said that the literacy level of customers may make the usage more complex than expected and as a result may pull the adoption of the technology down.

The other variable that contributes to the adoption of mobile banking technology is observability. Theoretically, the more observable the technology while being used by others, the more rate of diffusion will be. The finding of this research agrees with what is theorized. Because most of the respondents have positive response regarding observability of the technology in that 43.33% and 50.00% of respondents have respond strongly agree and agree respectively. Only 6.67% didn't show agreement regarding this variable. This shows that most of respondents perceive that observability positively affect adoption of mobile banking technology.

The last variable is trialability of mobile banking technology. In this regard most of the respondents (66.67%) replied agree for the trialability of mobile banking technology; and a significant number of respondent (23.33%) are didn't agree about the trialability of the technology. Only 10% replied strongly agreed. But still most of the respondents have agreed that mobile banking technology can be used in trial basis.

3.2.2. NON-TECHNOLOGICAL FACTORS AFFECTING MOBILE BANKING TECHNOLOGY

Non-technological factors are factors that are not directly related with the technology to be adopted. The following table explains the responses to the under listed variables affecting mobile banking technology adoption.

TABLE 2: IT MANAGERS' AND PRESIDENTS' PERCEPTION OF NON-TECHNOLOGICAL FACTORS

Variables	SAGR	percent	AGR	percent	NTR	percent	DIS	percent	Total	percent
Organizational Readiness	11	36.67%	14	46.67%	5	16.66%	0	0.00%	30	**100%**
Economic Capability	1	3.33%	24	80.00%	5	16.67%	0	0.00%	30	**100%**
Political issue	4	13.33%	9	30.00%	16	53.33%	1	3.33%	30	**100%**
Societal issue	0	0.00%	18	60.00%	12	40.00%	0	0.00%	30	**100%**

Source: primary data (2012)

The first variable among the non-technological factors is organizational Readiness. Organizational readiness is expressed via competent knowledge and skills of employees, top management commitment & support, organizational culture, organizational structure and so on. In Ethiopian context the banks expressed that their bank is ready to adopt mobile banking technology 36.67% and 46.67% of the respondents replied strongly agree and agree respectively, indicating that the banks are ready to accustomed themselves the mobile banking technology. There is no respondent disagreed in the issue.

Similar to organizational readiness, there is no bank disagreed regarding the economic capability of banks to adopt mobile banking technology. A total of 83% of respondents expressed their agreement in that economic capabilities of banks do not block them from adopting the new mobile banking technology.

The other variable is the political issue, which is concerned with the regulatory systems of the central bank of the nation. In this regard most of respondents (53.33%) are indifferent to agree or disagree; implying there might be some problems that hesitate the respondents to agree on the issue. There are of course, 43.33% of respondent who expressed their agreement. 3.33% of respondents expressed that they claim political issue is a bottle neck to adopt such technology in that the national bank of Ethiopia didn't enact a law allow adoption of mobile banking technology.

Regarding societal issue, although most of the respondents (60%) expressed their agreement in that the society can easily accept the technology, a significant percentage (40%) of respondent expressed their doubt in this issue. Identification of respondent gap has been tried to be solved using interview questions with the presidents of banks to be discussed below.

3.3. CORRELATION BETWEEN THE VARIABLES AND INTENTION OF BANKS TO ADOPT MOBILE BANKING TECHNOLOGY

Generally speaking, the explained technological and non-technological factors have no negative impact in Ethiopian banks to adopt mobile banking technology. The main representative of banks regarding the technology adoption replied their perception in that mobile banking technology has relative advantage; it is compatible, simple, observable and can be tried without incurring significant cost.

Moreover, they assured the bank at which they are managing has no management, commitment or economic problem. But they are a few in doubts about the social issue and more on political issue. However, the general response shows that the variables do negatively affect them to adopt the technology. This shows that banks have intention to adopt mobile banking technology. Such relationship between adoption intention of banks and the variables is shown under the following correlation matrix.

TABLE 3: CORRELATION BETWEEN INTENTION AND TECHNOLOGICAL AND NON-TECHNOLOGICAL FACTORS AFFECTING MOBILE BANKING TECHNOLOGY ADOPTION

	intention	rel_adv	compatib	simplicity	observ	trial	politica	social	organiz	economic
intention	1.0000									
rel_adv	0.4309	1.0000								
compatib	0.4023	0.6287	1.0000							
simplicity	0.5148	0.5472	0.4576	1.0000						
observ	0.4364	0.4229	0.5065	0.4423	1.0000					
trial	0.4660	0.2435	0.2757	0.4893	0.5525	1.0000				
politica	0.2476	0.4449	0.3465	0.3085	0.4515	0.0716	1.0000			
social	0.2689	0.2515	0.1231	0.1336	0.2179	0.1359	0.0322	1.0000		
organiz	0.5401	0.4063	0.4357	0.4528	0.5169	0.3886	0.5142	0.1589	1.0000	
economic	0.5549	0.5442	0.4889	0.6415	0.7109	0.4289	0.7169	0.1514	0.7870	1.0000

Source: primary data (2012)

The association shows there is positive relationship among all the variables and intention. Although this association (correlation) doesn't directly indicate the cause-effect-relationship between intention and the technological and non-technological factors, we can say it is probable that this association is causation. Because the theory assures that there is cause-and–effect relationship between intention of adoption and the factors.

3.4. ANALYSIS OF THE INTERVIEW QUESTIONS

Interview questions have been designed to the presidents of the commercial banks. Although we have distributed questionnaire to Information Technology managers and the presidents themselves, we conducted interview so as to address some questions that need further detail. Most of the presidents provided us identical information and we presented the interview analysis of some of the presidents as under.

COMMERCIAL BANKS OF ETHIOPIA

According to the interview with the president of commercial bank of Ethiopia, the bank has adopted CORE banking system, a system that interconnects all of its branches through telecommunication networking. Regarding adoption of mobile banking technology, he expressed that the bank has plan to introduce such technology, but not implemented yet because of lack of rule and regulation from the national bank of Ethiopia. According to the interview, the manager also added his expectation that customers are ready to accept new technologies adopted given that the technologies provide benefit to the customers by saving their cost and time, for instance. He also addressed that the employees are ready to adopt any new technology in the bank; because, the implementation of the technology will ease their work and bring additional knowledge to them.

CONSTRUCTION AND BUSINESS BANK S.C.

The president of the Construction and Business Bank S.C., regarding their intention to adopt mobile banking technology, answered that they have intention and plan to adopt mobile banking technology even though the priority the bank is opening other branches to areas where it didn't yet address. Describing that the bank is networking its branches through the CORE banking system, the manager said that the bank is waiting for the enactment of regulation by national bank of Ethiopia on this new technology. The president also described his confidence regarding the demand of such time and cost saving technology, and supposed that in this era of Information Technology, customers will undoubtedly be ready to use the technology. The president added his intellectual comment saying mobile banking technology is useful for all stakeholders in that it simplifies the way banking service is delivered.

COOPERATIVE BANK OF OROMIA S.C.

Cooperative Bank of Oromia, through its president, expressed that it has already adopted CORE banking system but not mobile banking technology yet. The president said that although the bank didn't plan to adopt mobile banking technology ever before, it believes that mobile banking technology will result in good advantage for the bank itself as well as for the customers. He said that customers' illiteracy might be one problem of adopting mobile banking technology. Regarding the bank's customers' readiness to adopt mobile banking technology, the president said we expect that our customers are ready to adopt mobile banking technology. This is proved through the CORE banking system, that customers have easily adopted it, we introduced before. However, there might be problem of adoption in rural Ethiopia, which will be time taking for the technology to be adopted. He also confidentially described that employees are ready to adopt any technology as long as it benefit our bank. The president generalized his idea by his comprehensive comment regarding benefits of mobile banking technology. He said the technology can be advantageous in terms of economy, time, safety and provision of faster service.

BUNA INTERNATIONAL BANK S.C.

Buna international bank has implemented CORE-banking system and it has planned to adopt mobile banking technology. The president of the bank said that this will be true if and only if the national bank of Ethiopia enacted the law that regulates this new technology. The president has explained that he had gone to India for experience sharing on how to adopt mobile banking technology; and hence the bank is only waiting for the enactment of the law by national bank of Ethiopia and as a result it is ready to implement the technology as soon as it enacted a the law. According to his personal view, customers' illiteracy is not the primary problem hindering commercial banks to adopt mobile banking technology. Although it is difficult to know the demand of the technology by customers now, you can predict what it will be from the benefit that the technology can provide. The technology is very time saving and cost saving technology that can benefit customers as well as banks. And for this fact there will be high demand of the technology and enough potential customers to use the technology.

WEGAGEN BANK S.C.

The president of Wegagen bank described that, Wegagen bank is waiting for the enactment of law by national bank of Ethiopia. He added that national bank of Ethiopia has discussed with the commercial banks of Ethiopia including Wegagen bank regarding the indispensability of mobile banking technology. But it has not yet enacted a regulation. Hence we are waiting for it". Even though national bank of Ethiopia enacted the law, the bank expressed its threat concerning the network problem in Ethiopia. Regarding his opinion regarding 'how customers might respond to the technology', the president said that since customers are

new for the technology, they might not have good attitude in the beginning. But it is not as such heavy issue for the fact that they will acquaint themselves with self service technology saving their time and money. The president added that the bank's employees are fast and willing to adopt new technologies; because, the technology will ease their working load by changing the service style.

ANBESSA INTERNATIONAL BANK S.C.

An Anbessa international bank also has similar response with other banks' responses. The president of Anbessa International Bank S.C. said that "though our bank has not introduced CORE-banking system in this time, it has planned to adopt in the near future". For the question asked regarding future plan of the bank in mobile banking technology adoption, the president answered that the bank has planned to adopt mobile banking technology, however, he said, the plan is not yet implemented because national bank of Ethiopia has not enacted the law so far. Although different discussions have been conducted with a number of presidents of different banks, national bank of Ethiopia has not enacted the law; hence we are with our plan waiting for the enactment of the law for the implementation.

The president added that the bank has planned to create awareness to its customers before the commencement of the new technology. So customers will not face any problem in adopting the technology; and customers' freshness to the technology will not a primary concern to block the bank from implementing the technology. Hence we expect that our customers will easily accustom to the technology for the fact that the technology will help them to get safety and convenience via the service. From the benefit that the technology can provide and its simplicity, we can assume that there will be high expected demand of the technology.

ADDIS INTERNATIONAL BANK S.C.

We have also interviewed the president of Addis International Bank S.C. As to the response of the president, Addis International Bank S.C. has networked its branches via the modern CORE banking system. Mobile banking technology is in plan to be adopted but waiting for the enactment of law by the National Bank of Ethiopia. He also said that since mobile banking technology is easy to learn, there will not be rejection of the technology by our customers. We even expect high demand of the mobile banking technology for the technology eases the way that customers can get banking service. The technology will enable our customer to get the service while they are actually at their work place or at home. This will shoot the demand more than we expect. On the other hand the bank has described that the telecommunication network is a critical issue once after the mobile technology is adopted for the fact that the technology is fully dependent on telecommunication network.

3.5. SUMMARY OF INTERVIEW ANALYSIS

The main reason that presidents are interviewed is to get detail information regarding why they didn't adopt the technology yet. Most presidents have one thing in common in that they replied that they are too late to adopt the technology not because of organizational factors but because of the lateness of national bank of Ethiopia to enact rule and regulation regarding mobile banking technology adoption. They blamed National Bank of Ethiopia for lagging to enact law and make them lag to adopt the technology. Some managers have indicated that telecommunication problem might be a threat that could challenge sustainability of the technology after it is adopted. Regarding their expectation to their customers' acceptance of the technology, they have respond that their customers (and of course, their employees) are ready to join new technologies for the fact that such technologies provide them with special benefit. Many of interviewed banks explained that they have assured the technology responsiveness of their customer while implementing CORE banking system. They added that they will create awareness to their customers about the technology so that the customers can easily and quickly join it.

4. CONCLUSION AND RECOMMEDATION

4.1. CONCLUSIONS

The study is conducted based on the main objective of determining factors affecting mobile banking technology. More over the research planned to identify the technological and non-technological factors affecting mobile banking technology adoption. The research used IT managers and presidents of banks as target population. Hence, questionnaire was provided to the target respondents to determine the banks intention as well as factors affecting the technology adoption. Interview was also carried out to get detailed information from presidents. From the analysis we draw the following conclusions.

- All banks have intention to adopt mobile banking technology.
- Relative advantage, compatibility, simplicity, observability and trialability are found to be technological factors affecting mobile banking technology adoption. We can say that most of the banks' IT managers and presidents agreed in that mobile banking technology has relative advantage. They also perceived it to be simple to operate and compatible with the culture, local language as well as the beliefs and values of the community. They also agreed in that mobile banking technology can be used in trial basis so that if it is found uncomfortable in any way, can be ignored without incurring significant cost. In addition they also perceived that mobile banking technology is observable that contributes to the quick diffusion of the technology from one adopter to the potential one.
- Political issue, economical capability, societal issue, and organizational readiness to adopt the technology are found to be non-technological factors that affect mobile banking technology.
- Political issue and societal issue get less attention by respondents compared to the other non-technological and technological factors. As we explored from the interview, presidents seriously blame National bank of Ethiopia for its lateness in enacting a law that formally permit them to use mobile banking technology. Moreover, there are banks who express telecommunication infrastructure as threat in the technology adoption. This might be the case where response of respondents in political issue is perceived to have less contribution to the technology adoption.
- Regarding the social issue, the banks explained that customers are technology responsive and they will develop different mechanisms that help to address their ultimate customers to create awareness.
- The correlation between intention and other technological and non-technological factors is all positive. However the correlation of intention and social issue as well as intention and political issue are week compared to the other variables.

4.2. RECOMMENDATIONS

The research team prefer to recommend on issues that can facilitate implementation of mobile banking technology for the fact that its implementation is very essential in the development of a country by saving time and cost of customers, banks themselves as well as employees.

- According to findings, we found that the main problem that commercial banks didn't implement mobile banking technology is the lateness of enactment of law by National Bank of Ethiopia. Hence, we strongly recommend the national bank of Ethiopia to enact a law that allow commercial banks to adopt mobile banking technology.
- Commercial banks have intention to adopt mobile banking technology and they know that it is useful for themselves, for their customers as well as employees. Hence, the banks should not only wait enactment of law by the central bank; they should also facilitate and push the central bank to fasten the enactment.
- To ease adoption of the technology by customers, the banks should promote the technology before implementation until the central bank enacts the law. This will reduce the confusion which would be created by customers as banks adopt the technology.

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EVALUATION OF LIC'S EFFICIENCY IN GENERATING CAPITAL FUNDS UNDER ULIP'S SCHEMES

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ABSTRACT

Globalization of the financial markets has lead to a manifold increase in the investment. New markets has opened new instruments has developed and new services have been launched. The purpose of financial market is to promote savings, investment and efficient allocation resources among the competing users. One of the principle aims of these markets is to provide crucial infrastructure for corporate to access community savings through a mix of debt and equity instruments. Various investment avenues are available in India but still Insurance is considered as one of the popular investment tool. Insurance is a flourishing industry in India, with several national and international players competing and growing at rapid rates. Thanks to reforms and easing of policy regulations, the Indian insurance sector been allowed to flourish, and as Indians become more familiar with different insurance products, this growth can only increase, with period from 2010 – 2015 projected to be the 'Golden Age' for the Indian insurance industry-. Therefore the present paper is an attempt to identify the reasons, why the investors still invest in ULIP's offered by LIC. The scope of the present study is covered the urban areas as well most of the rural areas of Shivamogga city and Bhadravathi Town. Questionnaires were administered to receive the responses from the target group. Simple Chi-square test and Co-relation test is used for the analysis of the data.

KEYWORDS
Insurance regulatory, net asset value.

INTRODUCTION

Indian insurance companies offer a comprehensive range of insurance plans, a range that is growing as the economy matures and wealth of the middle classes increases. The most common type include: term life policies, joint life policies, endowment policies, whole life policies, loan cover term assurance policies, unit-linked insurance plans, group insurance policies, pension plans, and annuities. General insurance plans are also available to cover motor insurance, home insurance, travel insurance and health insurance. In Insurance industries, Life Insurance Corporation is only public sector and considered as the market with its good will and performance it is also providing above discussed products to the investors of medium, low as well as high level income people.

UNIT LINKED INSURANCE PRODUCTS

Unit linked insurance plan (ULIP) is life insurance solution that provides for the benefits of risk protection and flexibility in investment. A part of the premium paid is utilized to provide insurance cover to the policy holder while the remaining portion is invested in various equity and debt schemes. The money collected by the insurance provider is utilized to form a pool of fund that is used to invest in various markets instruments (debt and equity) in varying proportions just the way it is done for mutual funds.. Policy holders have the option of selecting the type of funds (debt or equity) or a mix of both based on their investment need and appetite. Just the way it is for mutual funds, ULIP policy holders are also allotted units and each unit has a net asset value (NAV) that is declared on a daily basis. The NAV is the value based on which the net rate of returns on ULIPs are determined. The NAV varies from one ULIP to another based on market conditions and the fund's performance. In a ULIP, the invested amount of the premiums after deducting for all the charges and premium for risk cover under all policies in a particular fund as chosen by the policy holders are pooled together to form a Unit fund. A Unit is the component of the Fund in a Unit Linked Insurance Policy. ULIP play a major role in the Indian life insurance. the strength of the ULIP product that suit the psycho of Indian policyholder because Market linked return, Level of insurance protection, Option of asset diversification Management of fund on professional lines.

STATEMENT OF THE PROBLEM

The Indian life insurance industry has been on a roller-coaster ride in this past year and since financial services in general have been under tremendous pressure, the insurance industry has also witnessed its fair share of downfalls. Deterred due to the regulatory changes, low margins and lack of a policy road map, the life industry today is reeling under the effect of negative growth. The unabated inflation, recessionary trends and fall in industrial production have all had their impact on economy which has lead to the economy growth rate hovering at just about 7 per cent. Throughout the year, the stock markets witnessed violent swings, coupled with reduction in margins on account of new guidelines, which dented the performance of ULIPs. LIC is not except from this. But still when compare to the other private sector players performance of LIC is for better. Therefore the present paper is an attempt to identify the reasons, why the investors still invest in ULIP's offered by LIC.

OBJECTIVES OF THE STUDY

To study why the investor prefer Life insurance sector especially LIC, to invest their savings and also to analyze the factors considered by the investors preferring the ULIP's offered by LIC instead of preferring direct investments in stock markets. And to determine the policy reforms to ULIP's by SEBI.

SCOPE OF THE STUDY

The scope of the present study is covered the urban areas as well most of the rural areas of Shivamogga city and Bhadravathi Town. Moreover in the present study only the various schemes of ULIP's offered by LIC.

METHODS OF DATA COLLECTION

In order to reach above stated objectives the primary data is collected through questionnaire method and interaction with the respondents. Secondary data is collected through published sources like journals, Books and e-sources.

SAMPLING TECHNIQUE ADOPTED

For this study simple random sampling was is used and respondent groups had employees, housewives, Formers, business men of various income groups and also insurance advisors of LIC were selected randomly. Questionnaires were administered to receive the responses from the target group.

STATISTICAL TOOL USED FOR ANALYSIS

Simple Chi-square test and Co-relation test is used for the analysis of the data.

HYPOTHESIS OF THE STUDY

The researchers tried to identify the respondent's opinion regarding few vital aspects concerning the stake holders in the studied segment. Hypothesis tested are,

Ha0 : Income level, Savings, investment pattern of the people are not co-related.
Ha1 : Income level, Savings, investment pattern of the people are co-related.
Hb0 : Investor continue to hold investment in stock market.
Hb1 : Investor prefer to hold investment in capital market through ULIP's by LIC.

Policy Reforms is another reason for investments in ULIP's:

ULIP's with less than 10 Years

1. There is 3% cap on charges levied by the insurance companies on **ULIP**. It means, the total fees collected on **ULIP** premiums cannot exceed 3%. It is defined as difference between net yield and gross yield should not exceed 3%.
2. In the above 3%, the management fee cannot be more than 1.5%.
3. Gross yield is the yield generated by the **ULIP** before all charges are deducted.
4. Net yield is the generated by the **ULIP** after all charges are deducted.

ULIP with greater than 10 years

1. Over all fees cannot be more than 2.25%.
2. Management fees cannot be more than 1.25%.

- Charges here would include allocation charges, administration charges, mortality charges and all such charges by any other name. the total fees would reduce when you opt for the long term investment.
- Unit-linked insurance products (**ULIPs**) filled after September 30, 2009 will have a lock in five years.
- According to the **IRDA**, there will be new norms on tightening the commission and fees on **ULIP products**. It is trying hard to make the investment more attractive for the investors.
- The new norms will have the high life cover; in the existing policies have the high focus on the investment rather than the protection on life. **IRDA** want to bring more clarity on the life cover and investment portion on the same product. These make investor to clearly understand how much is invested and how much is insured.
- In order to put more money in the hands of investors, **IRDA** recently said that insurers cannot charge a fee for surrendering the policy even after the completion of the lock-in period.

DATA ANALYSIS AND INTERPRETATION

TABLE 1: PROFILE OF THE RESPONDENT

Age	
25-35	20
35-45	50
45-55	30
55and above	10
Total	100
Education Qualification	
Below SSLC	23
SSLC	25
PUC	13
Any Degree	26
Others	13
Total	100

Sources: primary data

TABLE 2: INVESTMENT PORTFOLIO OF THE RESPONDENTS

Investment portfolio	**Response**
Equity	20
Mutual Funds	26
Insurance	90
Bonds	28
Debentures	12
Fixed Deposits	50

Sources: primary data

TABLE 3: FACTORS INFLUENCING THE INVESTORS TO INVEST IN LIC (MULTIPLE RESPONSES)

Factors	**Response**
Safety and security	90
Public Sector	76
Rate of Returns	82
Many Schemes	85
Good post performance	52
Avoid Tax	52

Sources: primary data

TABLE 4: INVESTMENT PORTFOLIO OF THE RESPONDENTS IN ULIP'S OF LIC

Investment Portfolio	**Response**
ULIP's	54
Non ULIP's	36
Total	90

Sources: primary data

TABLE 5: RATIONAL BEHIND INVESTMENT IN ULIP'S OFFERED BY LIC (MULTIPLE RESPONSES)

Reasons	Response
Save Tax	55
Liquidity	42
High Returns	78
Dual Benefits	75
Investment in capital market	80

Sources:primary data

The above five tables clearly shows the demographic factors of the respondents and their income level, savings and their investment preference and also the reasons behind the selection of investment avenues and reason behind investment in LIC and ULIP's offered by LIC.

TABLE 6: CALCULATION OF CO-EFFICIENT TO KNOW WHETHER SAVINGS AND INVESTMENT, INCOME ARE CO-RELATED

C-I	X	y	dx=x-a	Dy=x-b	dx2	dy2	dxdy
Below 50000	45	43	43	39	1849	1521	1677
50000-150000	33	12	31	08	961	64	248
150000-300000	18	30	16	26	256	676	416
300000-500000	2	11	0	07	0	0	0
Above 500000	2	04	0	0	0	0	0
Total	**100**	**100**	**90**	**80**	**3066**	**2261**	**2341**

Hao: Income level, Savings, investment pattern of the people are not co-related.

Hal: Income level, Savings, investment pattern of the people are co-related

Let Income will be the class intervals, savings is taken as 'x', Investment is taken as 'y', calculated **co-relation co-efficient** value is **0.1974**. Therefore it is positive co-relation. Therefore the null hypothesis is rejected and alternative hypothesis is accepted. Here can conclude that income levels, Savings, investment pattern of the people are co-related.

TABLE 7: OPINION OF THE INVESTOR REGARDING HOLDING INVESTMENT

Reasons	Safety and Security	Direct Transaction	Liquidity	Dual Benefit	Total
ULIPs by LIC	20	0	0	46	66
Stock Markets	0	14	20	0	34
Total	20	14	20	46	100

Sources:primary data

Hbo: Investor continue to hold Investment in Stock market

Hbl: Investor prefer to hold Investment in capital market through ULIP's by LIC

Chi-square calculated value is **83.96.** For 3 degrees of freedom Chi-square tale value for 1% and 5% level of significance is 11.341 and 7.815. The calculated value is more than the tables value therefore the null hypothesis is rejected and alternate hypothesis is accepted. So that we can conclude that, Investor prefers to hold investment in capital market through ULIP's by LIC. For the reason it is providing dual benefits like coveras well as returns and investment in capital market. At the same time LIC's good will and market share also made the investor to invest in ULIP's offered by LIC.

CONCLUSION

ULIP's are considered as a tool by the investors to invest in capital market. Especially they prefer ULIP's offered by LIC because they feel that LIC is safer place for investment and also they are getting dual benefits like insurance as well as high returns. But still the risk is more due to the investment made in ULIP's are directly invested in markets. And investment is depended on the net asset value of the stock in which the fund is invested. Due to economic slowdown the short term investor of ULIP's are suffered a lot but long term investors are not affected from the downsizing. Therefore the investor must concentrate on these issues while selecting the ULIP products; they must use this as a tool for investment in insurance, but also for investment in stock markets. Moreover the SEBI has been given new policy reforms to the insurance companies in selling the ULIP products which reduces the charges like **Initial administration charge, Regular administration charges, Policy administration fee, Investment management charge etc.** This helped investors to invest in ULIP's.

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EVALUATION OF COST MANAGEMENT TOOLS: A STUDY ON MULTINATIONAL PHARMACEUTICAL COMPANIES OF BANGLADESH

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ABSTRACT

Today's competitive business environment structured with sluggish market growth, high customer demand, change in technology and product features, high overhead costs, changing role of accountants and management create severe challenges for companies, especially for multinationals as they have to compete in a global world of business complying with local as well as foreign regulations. For pharmaceuticals the challenge is bigger as they have to ensure higher quality as well. To deal with these challenges they need to implement modern techniques that can best achieve the strategic objectives and goal. One of these techniques is Cost Management structure of a company. This study attempts to find the answers of two research questions, (1) which factor(s) is (are) considered the most significant acting behind the application of cost management tools in the multinational pharmaceutical companies in Bangladesh? And (2) which tool(s) is (are) considered most effective in Cost Management? For this study, three multinational pharmaceutical companies were surveyed with questionnaires designed in 5 point Likert Scale. The results are analysed with descriptive statistical tools, Mean and Multiple Regression Analysis. Analyses revealed that compliance with the standards and guidelines set by the parent company, global competition needing more accurate and timely information and demand of upgrading quality are the most influencing factors acting behind application of cost management tools by the companies. And that ABC (Activity Based Costing), Standard costing and Mixed Costing are the most effective tools considered by the organisations.

KEYWORDS
Cost Management tools, Influencing Factors, Multinational Pharmaceutical Companies.

INTRODUCTION

Recent advances in information technology, coupled with deregulation and market liberalisation worldwide, have fuelled an extraordinary flow in the growth of multinational corporations (MNCs). However establishment of overseas business requires compliance issues. Bangladesh is one of the developing countries which have been successful in inviting international businesses. One of the growing sectors is Pharmaceuticals. However, as urban population is increasing and people are getting educated, they are now more concerned about healthcare. On the other hand unhygienic conditions, poor health maintenance plans and constant natural disasters provide scope for the pharmaceutical firms to sell their products in Bangladesh. The industry is exporting medicines to global markets as well.

However, in today's environment, nothing is constant or predictable - not market growth, customer demand, product life cycle, technology, or the nature of competition (Hammer and Champy, 1993). Product ranges have increased, direct labour costs have decreased and facilities costs have increased. And accordingly have changed the role of management accountants; two of which are being aware of the change in production technology influencing current costing system and ensuring proper and relevant costing system (Ashton, Hopper & Scapens 1995). Many trends and changes in the business environment in recent years have caused significant modification in Cost and Management Accounting concepts and methods.

Traditional cost management techniques, such as absorption costing, standard costing, traditional budgets, CVP analysis and profit-based performance measures focus on concerns internal to the organisation. The more recent cost management tools, such as activity based costing (ABC), target costing, value chain analysis and benchmarking have affected the whole process of management accounting (planning, controlling, decision making, and performance evaluation) and have shifted its focus from merely cost determination and financial control, to a sophisticated role of creating value through improved deployment of resources (Kaplan and Atkinson, 1998; Otley, 1995; Haldma and Laats, 2002).

It has been observed from previous researches that the adoption of the strategic cost management practices, when segregated in countries, unlike Asian countries, present higher frequency of use in developed countries like Japan, Italy and United States of North America. In Bangladesh, there have been a very few researches on Cost Management Accounting Practice which inspired me initiate a research in this area. Also this study will enlarge the scope of further researches benefiting the practitioners to come up with feasible solutions to the problems identified in the research and also stimulate application of these tools in Bangladesh.

REVIEW OF LITERATURE

Thompson (1995) said, a strategy is a set of goals and specific action plans, which, if achieved, will provide the desired competitive advantage. A critical ingredient of success of a firm is effective Strategic Management of which Cost Management is a part. The growing pressures of global competition, technological innovation, and changes in business processes have made Cost Management much more critical and dynamic than ever before.

EVOLVEMENT OF COST MANAGEMENT TOOLS

If evolvement of cost and management accounting is to be traced, 20th century would be the starting point. During this century advancement in cost and management accounting took place as the scientific management experts developed new cost accounting procedures to evaluate and control physical and financial efficiency of tasks and processes in complex machine-making firms and to assess the overall profitability of the enterprise (Johnson and Kaplan, 1987). Approximately at the same time different articles were published promoting the use of standards for cost control (Longmuir, 1902; Garry, 1903; Whitmore, 1908).

In line with the work of Smith (1999), the chronological evolvement of cost and management accounting can be explained as follows:

- 1950s: Cost and management accounting innovations in 1950s include Discounted cash flows, (TQM) Total quality management, Colum charts and Optimum transfer pricing.
- 1960s: Computer technology, Opportunity cost budgeting, Zero-base budgeting, Decision tree, Critical path scheduling, and Management by objectives were few of that time.
- 1970s: Innovations of cost and management accounting in 1970s can be identified as Information economics and agency theory, Just-in-time scheduling, Strategic business units, Experience curves, Portfolio management, Materials resource planning, Diversification, Matrix organisation and Product repositioning.
- 1980s: 1980's innovations regarding cost and management accounting can be identified as ABC (Activity based costing), Target costing, and Value-added management, Theory of constraints, Vertical integration, Private labels and Benchmarking.
- 1990s: Innovations of this period include Business process reengineering, Quality functional deployment, Outsourcing, Gain sharing, Core competencies, Time-based competition and Learning organisation.

Björnenak, T., & Olson, O. (1999) after reviewing cost and management accounting innovations of the last two decades, declared activity based costing (ABC), activity management (AM) and activity based management (ABM), local information system (LS); balanced scorecard (BS), life cycle costing (LCC) and target costing (TC), strategic management accounting (SMA) as the major recently developed cost and management accounting techniques.

FACTORS ACTING BEHIND APPLICATION OF COST MANAGEMENT TOOLS

There are three major forces that cause organisations to evolve: technological change, globalisation, and customer needs (Mc Watters, 2001). Research studies have identified some influential changes that had an effect on the cost management techniques. The most influential changes in environment include globalisation of business, more focus on consumer and quality and advances in manufacturing and information technologies (El Kelety, 2006).

Global competition is the driving force behind the expansion of organizations. With the pace of global competition, more timely and current information are needed. This includes managers needing a better understanding of costs involved in producing or supplying a product or service. For many decades, traditional costing systems have been used to value inventory and measure cost. Unfortunately, using traditional cost accounting to track these costs has proven to be inadequate both domestically and globally (Johnson & Kaplan, 1987). Now it comes to manage cost in today's competitive world of business for which accountants need some more. Cost and Management Accountants in a globalised world are now expected to be team players in such areas as product development, profitability analyses, quality process and improvements, and the evaluation of overall company performance (Welfle and Keltyka, 2000). According to Shank & Govindarajan (1997), cost management can lead to an effective control of spending and thus can fight against the competition.

Another factor that initiates the need of using cost management tools is the shift towards customers' demand. In recent years, markets are possessed by buyers rather than sellers. Customers are more knowledgeable, less loyal, and more cautious. Today, customers demand products that meet or exceed their expectations, are delivered on time, are defect-free, and have low prices and low cost of ownership (Lynch 1999). Besides the customer's needs, the severity of competition has also changed. In today's globally competitive environment, companies compete on the basis of not only price but also quality, product flexibility, and response time. One way to achieve quality is to implement TQM (Total Quality Management). Total quality management assumes that quality can and should always be improved however companies that implement total quality management (TQM) are likely to find that it has little economic benefit unless the company's cost management systems support it (Shank and Govindarajan, 1993).

Due to rapid change in technology and intense competition from that, companies are adopting modern techniques of processes such as JIT (Just In Time), Flexible manufacturing systems (FMS) including computer-aided design (CAD), computer-aided manufacturing (CAM) etc. Modern Cost Management systems have to adapt to this new technological environment as the high production overhead cost of these systems not only requires a special attention to overhead allocation but also an estimation of the expected production cost (Koltai et al 2000).

Reduction of cost has been a major issue for companies. As a strategic cost management tool, activity-based costing (ABC) plays a vital role in that case. Implementation of ABC reduces costs and improves the resource allocation that is consistent with strategic objectives and budget surplus (Zaman, 2007). Besides, ABC if combined with TQM and business process re-engineering help many organisations to better manage their business activities (Adams, 1996). ABC is applied to accomplish budgeting, reduction of cost and improvement of process and activities (Miller 1996). It's also used as benchmarking as well as customer profitability analysis (Friedman & Lynne 1995).

When properly implemented, JIT, TQM, Process Reengineering and various other management programmes can enhance quality, reduce cost, increase output, eliminate delays in responding to customers and ultimately to increase profit (Garrison and Noreen, 2004).

Harrington Emerson, in a series of articles in the Engineering Magazine of 1908 and 1909 advocated that Standard Costing (first designed and installed in 1918 by G. Charter Harrison) permits managers to differentiate variances that are due to controllable conditions and those that are beyond management's control. KPMG in association with CIMA conducted a global research in February 2010 and found that the current economic crisis around the world along with volatility in foreign exchange rate, price of raw material and commodities have created significant cost pressures on businesses and thus stressed the application and use of standard costs.

The most needed tool to control cost in a multi-division organisation is Budgetary Control to ensure different divisions' activities are in harmony with the corporate goal (Russell, K.A., Siegel, G.H. & Kulesza, C.S., 1999)

Also, in case of multinational companies, there are certain rules, policies, procedures and objectives or target performances set by parent company to manage subsidiary activities (Roth and Nigh, 1992). Also the plans, schedules and system of communication of information are set by the parents. (Van de Ven, Delbecq and Koenig, 1976).

PRACTICE OF COST MANAGEMENT TOOLS IN BANGLADESH

For the appraisal of different cost management tools and techniques in the business environment of Bangladesh, many studies have been carried out in 21st century. One of the earlier studies regarding the practice of cost and management accounting was conducted by Sharkar, Sobhan and Sultana (2006). Under this study the authors selected companies from different sectors, 10 of which were from pharmaceuticals and chemicals industry in Bangladesh. According to the study results: direct labour cost and overhead cost covers the highest portion of product; most of them use machine hours for allocation of overhead, but direct labour cost is most common; most of the companies use full cost system and some of them use both variable and full costing; no firms use throughput, target and life cycle costing; none of them use job order costing method, instead all the firms use process-costing method for cost accumulation.

A study by B.C. Mazumder (2007) committed towards finding the pace of usage of cost management techniques by manufacturing organisations of Bangladesh found that, modern techniques like Activity-Based Costing, Target Costing, Just-in-Time (JIT), Total Quality Management (TQM), Process Reengineering and The Theory of Constraints (TOC) were not used in public and private sector manufacturing enterprises but a few Multinational Corporations (MNC) are found using some of these techniques such as JIT and TQM.

To find out the significance and impact of different types of Cost Accounting techniques on decision making of organisations in Bangladesh, Fowzia (2010) carried out a study in which 60 listed manufacturing organisations were surveyed. It was found that 20 cost accounting techniques were about 80 % important for decision making. It also revealed that Target Costing was the most influential technique in decision making and Back-flush Costing was the least important.

A study of Yeshmin and Fowzia, (2010) surveyed 151 organisations from manufacturing and service industries in Bangladesh by identifying 14 management techniques. The result revealed that management accounting techniques such as financial statement analysis, budgetary control, CVP analysis, variance analysis and fund flow analysis were common in both the industries and were used frequently in managerial functions.

Yeshmin and Hossan (2011) conducted a study to measure the significance of management accounting techniques in decision making. In doing so, a total of 74 Bangladeshi manufacturing organisations of different categories were surveyed. The study result reveals that cash flow statement analysis, ratio analysis, budgetary control, CVP analysis, variance analysis and fund flow analysis have been frequently used.

A recent study by Fowzia and Nasrin (2011) on the appraisal of Cost management tools in manufacturing organisations of Bangladesh examined the influence of different types of cost management tools in profit planning decisions and also explored the overall satisfaction of these tools. Findings from surveying 70 manufacturing organisations disclose that only five cost management tools (Traditional Costing, Quality Costing, ABC, Absorption and Back-flush Costing) are influential in profit planning decisions and that there are three satisfying cost management tools which are ABC, Differential & Kaizen Costing.

IMPORTANCE OF THE STUDY

The study highlights the implications of Management Accounting tools in Bangladesh. The importance of the study rests in the identification of the reasons that make Multinational Companies apply Management Accounting tools and initiate to build a more sophisticated Cost Management practice in Bangladesh that the local industries have been incapable to do till date.

OBJECTIVE OF THIS STUDY

The aim of this paper is to evaluate whether practice coincides with the premises of Management Accounting tools and techniques. The study intends to find what factors inspire organisations to follow the tools and what the most effective tools are in particular.

RESEARCH QUESTIONS

There are two questions to be answered by this study:

1. Which factor(s) is (are) considered the most significant acting behind the application of cost management tools in the multinational pharmaceutical companies in Bangladesh?
2. Which tool(s) is (are) considered most effective in Cost Management?

RESEARCH METHODOLOGY

SAMPLE SIZE

This study covers assessment of cost management tools in existing three multinational pharmaceutical companies of Bangladesh, Novartis (Bangladesh) Limited, GlaxoSmithKline (GSK) Bangladesh limited and Sanofi-Aventis Bangladesh limited.

DATA COLLECTION

The required primary data was collected by two structured questionnaires related to the research questions based on 5 point Likert measurement scale. Both the questionnaires were filled in by the Finance heads of the organisations.

In the questionnaire related to the first research question, 11 influencing factors, based on the thorough literature study, are set as the variables. Here 5 represents Strongly Agree , 4 represents Agree, 3 represents Neutral, 2 represents Disagree and 1 Strongly Disagree.

In the questionnaire related to the second research question, 20 Cost Management tools are considered as the variables. On the scale 5 represents Most effective, 4 represents Effective, 3 represents Average, 2 represents Slightly Effective and 1 Not Effective.

DATA ANALYSIS

Mean and Multiple Regression Model, these two descriptive statistical tools are applied to find the research queries. Microsoft Excel and statistical software, SPSS 17 are used for the respective analyses.

RESULTS AND DISCUSSION

FACTORS THAT ACT BEHIND APPLICATION OF COST MANAGEMENT TOOLS

This study has exposed the influence of 11 factors (Table A) in application of cost management tools in organisations. The factors are considered as the relevant variables. At first, mean item score has been calculated to analyse the relative significant factors in application of cost management tools (Table A).

TABLE A: FACTORS INFLUENCING APPLICATION OF THE TOOLS

No	Factors influencing application of Cost Management tools	No	SA	A	N	D	SD	MIS
1	Global competition needing more accurate and timely information.	3	3	0	0	0	0	5.00
2	Shift towards Customers' demand of low cost of ownership.	3	0	2	1	0	0	3.67
3	Upgrading quality being the most required feature.	3	1	2	0	0	0	4.33
4	Rapid change in technology initiating high-tech manufacturing process leading to higher overhead cost.	3	1	1	0	1	0	3.67
5	Cost reduction and Cost control.	3	2	1	0	0	0	4.67
6	Reallocation of company resources.	3	0	2	1	0	0	3.67
7	Calculation and differentiation of variances.	3	0	2	1	0	0	3.67
8	Estimation of future cost and budgeting.	3	0	2	1	0	0	3.67
9	Improvement of business processes & activities leading to higher performance.	3	2	1	0	0	0	4.67
10	Increase in profit.	3	2	1	0	0	0	4.67
11	Compliance with the standards and guidelines for cost management set by the group head or parent company.	3	0	3	0	0	0	4.00

Source: Computation of weighted-average-mean of the scores using Microsoft Excel.

Among the mean item scores, the following six are considered the most influencing factors that are equal to or above 4:

1. Global competition needing more accurate and timely information.
2. Upgrading quality being the most required feature.
3. Cost reduction and Cost control.
4. Improvement of business processes & activities leading to higher performance.
5. Increase in profit and
6. Compliance with the standards and guidelines for cost management set by the group head or parent company.

To find out the level of significance of the factors, multiple regression analysis is used.

The Regression Model 1 is specified as follows:

$$ACMT = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 \ldots\ldots\ldots + \beta 11X11 + e$$

Where, ACMT = Application of Cost Management Tool

β0 = Constant

β1, β2, β3.....β11 = Estimated coefficients for the given factors

X1, X2, X3.....X11= The 11 factors respectively mentioned in Table A.

e= error

The regression result is highly significant (.107) (Table C). The coefficient of determination indicates that 78.7 % of the variation in application of cost management tools in is explained by variations in the purposes or factors influencing the decision (Table B).

TABLE B: MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.945	.893	.787	2.082

Source: Output of SPSS Statistics 17.0

TABLE C: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72.533	2	36.267	8.369	.107
	Residual	8.667	2	4.333		
	Total	81.200	4			

Source: Output of SPSS Statistics 17.0

The result also shows (Table D) significance of each of the 6 factors at 5 % level of significance. Among them, three most significant factors are:

1. Compliance with the standards and guidelines for cost management set by the group head or parent company (.627).
2. Upgrading quality being the most required feature (.193).
3. Global competition needing more accurate and timely information (.109).

TABLE D: SIGNIFICANCE

Factors	Standardised Coefficients	Significance
Global competition needing more accurate and timely information	.794	.109
Upgrading quality being the most required feature	.695	.193
Cost reduction and Cost control	.943	.016
Improvement of business processes & activities leading to higher performance	.943	.016
Increase in profit	.943	.016
Compliance with the standards and guidelines for cost management set by the group head/parent	.298	.627

Source: Output of SPSS Statistics 17.0

MOST EFFECTIVE COST MANAGEMENT TOOLS

To find out the answer of the second research question, I selected 20 cost management tools (Table E). These 20 tools are considered the relevant variables to conduct the analysis. Mean item score has been measured first. (Table E).

The below table highlights that, among the mean item scores of 20 variables, 6 are most effective based on the MIS falling equal to or above 4:

1. Standard Costing.
2. Activity Based Costing (ABC).
3. Hybrid/Mixed Costing.
4. Total Quality Management (TQM).
5. Cost-Volume-Profit Analysis (CVP).
6. Flexible Manufacturing System (FMS).

To find out the level of significance of the cost management tools in respect of their effectiveness in cost management of a company, multiple regression analysis is used.

TABLE E: MOST EFFECTIVE TOOLS

No.	The most effective Cost Management Tool	No	ME	E	Avg	SE	NE	MIS
1	Traditional budgets	3	0	0	3	0	0	3.00
2	Standard costing	3	1	2	0	0	0	4.33
3	Absorption costing	3	0	1	2	0	0	3.33
4	Variable costing	3	0	0	2	0	1	2.33
5	Target costing	3	0	1	1	0	1	2.67
6	Activity based costing	3	2	1	0	0	0	4.67
7	Zero defects costing	3	0	2	0	0	1	3.00
8	Life cycle costing	3	0	0	1	1	1	2.00
9	Job order costing	3	0	0	2	0	1	2.33
10	Process-costing	3	0	2	0	0	1	3.00
11	Hybrid or mixed costing	3	3	0	0	0	0	5.00
12	Differential costing	3	0	0	0	2	1	1.67
13	Throughput costing	3	0	0	1	0	2	1.67
14	Back-flush Costing	3	0	0	1	0	2	1.67
15	Kaizen costing	3	0	2	0	0	1	3.00
16	Theory of Constraints	3	0	0	1	0	2	1.67
17	Total Quality Management	3	1	2	0	0	0	4.33
18	CVP analysis	3	0	3	0	0	0	4.00
19	Just-in-time scheduling	3	0	1	0	0	2	2.00
20	Flexible manufacturing systems	3	0	3	0	0	0	4.00

Source: Computation of weighted-average-mean of the scores using Microsoft Excel.

The Regression Model 2 is specified as follows:

ECM= β0 + β1Y1 + β2Y2 + β3Y3…….. + β20Y20+ e

Where, ECM = Effectiveness in Cost Management

β0 = Constant

β1, β2, β3, …….β20 = Estimated coefficients for the given factors

Y1, Y2, Y3…….Y20= The 20 cost management tools mentioned in Table E.

e= error

The regression result shows that the regression model is highly significant (.516) (Table G). The coefficient of determination also indicates that 42.6 % of the variation in effectiveness in cost management is explained by variations in the types of cost management tools (Table F).

TABLE F: MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.696	.484	.426	7.000

Source: Output of SPSS Statistics 17.0

TABLE G: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	92.000	2	46.000	.939	.516
	Residual	98.000	2	49.000		
	Total	190.000	4			

Source: Output of SPSS Statistics 17.0

Table H shows significance of 6 tools in cost management function of the companies at 5 % level of significance. Among them, three most significant tools in descending order are:

1. Activity Based Costing (ABC) (.897).
2. Hybrid/Mixed Costing (.498).
3. Standard Costing & TQM (.451)

TABLE H: SIGNIFICANCE

Factors	Standardised Coefficients	Significance
Standard Costing	.446	.451
ABC	-.081	.897
Hybrid/Mixed Costing	-.406	.498
TQM	.446	.451
CVP	.649	.236
FMS	.649	.236

Source: Output of SPSS Statistics 17.0

RECOMMENDATIONS

The study recommends the local pharmaceutical companies and all other local industries as well that they move on to the application of modern Cost Management tools in their business management. These tools not only ensure Cost Control but also help in strengthening quality of the products and also in being competitive in the global business world.

CONCLUSION

Today's global market needs more information mostly from the multinational companies. For that matter, companies have to comply with the guidelines set by their parents. And if the companies are doing business with health products, they have to ensure quality as well. All these issues act behind application of Cost Management tools in practice by the multinational pharmaceutical companies. This report highlights that to meet the need of global competition, parent company's guidelines and demand of quality; six cost management tools play the most effective role. Among them Activity Based Costing, Standard Costing and Hybrid Costing are considered most significant.

LIMITATIONS OF THE STUDY

The major limitation of this study is that the survey is restricted only to a specific sector, multinational pharmaceutical companies. Also, this research study examines only a few selected cost management tools based on the relevant literature and common practice.

SCOPE FOR FURTHER STUDY

The limitations of the study emphasise that more expanded studies can be conducted using similar variables for all the other sectors of business apart from the multinational pharmaceutical companies. A good number of cost management tools can be added for further studies as well. Future researches can also examine the impacts of these cost management tools on firm's performance or image.

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AN EVALUATION OF NEW ZEALAND'S EXPORT COMPETITIVENESS USING SHIFT-SHARE ANALYSIS

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ABSTRACT

Being a small country, New Zealand's economic performance depends largely on external trade. Accordingly, New Zealand negotiated free trade agreements with several countries the most notable being the Closer Economic Relations agreement with its closest neighbour, Australia. As a result, there has been a significant increase in the merchandise exports coupled with a change both in the export market structure and the commodity composition during the study period i.e. 2005-2011. The aim of the study is to analyse the influence some key variables such as growth in world exports, commodity composition, trading partner distribution and competitiveness on the export growth. Shift-share analysis has been applied to decompose the impact of these factors on exports. Top 10 commodities to top 6 destinations have been included in the study. Data has been sourced from UNCOMTRADE database and Statistics New Zealand. The results show that overall growth in world exports, Globo, has been the major contributing factor followed by a positive effect of New Zealand's own export competitiveness, Perfo. Both commodity composition, Compo, and trading partner distribution, Geo, had a negative impact on New Zealand's exports. In order for the Geo component to become positive New Zealand needs to increase its exports to countries that do not export primary products such as dairy and meat on a large scale.

JEL CLASSIFICATION
F1 Trade

KEYWORDS
Composition (Compo), Geographical (Geo), Global (Globo), Performance (Perfo), Shift-share Analysis.

INTRODUCTION

New Zealand (NZ) is a trade dependent nation and being a small country its economic prosperity depends on its export performance. Historically, New Zealand had a narrow export base both in terms of markets and commodity composition. In 1970, the major export markets were the UK and the USA accounting for 55% of NZ's exports. The commodity composition concentrated on primary products such as Dairy, Meat and Wool which together accounted for 95% of the merchandise exports. NZ was accorded a special status with UK as a result of a trade agreement in 1932, accordingly the latter remained NZ's major export destination. When the UK joined the EEC in 1973 the special status extended to NZ ended (Abbott 2007). This development has compelled NZ to find new markets for its exports. A major development in this direction was the signing of Closer Economic Relations Trade Agreement (CER) with Australia in 1983. Consequently, there has been a significant growth in NZ's merchandise exports to Australia. Encouraged by this, subsequently NZ has negotiated free trade agreements (FTAs) with several other countries to diversify the export markets. These agreements include a Closer Economic Partnership Agreement with Singapore in 2001, Trans-Pacific Strategic Economic Partnership agreement with Singapore, Chile and Brunei (2005), a CEP with Thailand (2005) NZ-China FTA (2008), and ASEAN-AUSTRALIA-NZ FTA in 2010 to strengthen the external sector and enhance the gains of free trade.

FTAs tend to have a positive impact on export growth and market diversification. NZ's merchandise exports recorded a significant growth in the recent years from 17% of GDP in 2003 to 24% in 2011. During the years 2005-2010 the world merchandise exports increased by an average of 8% per annum. As against this, New Zealand's merchandise exports increased by an average of 8.25% per annum during the above period. An important feature of NZ's merchandise exports is that between the years 2000 and 2004 the growth was practically stagnant with a 5% growth in 2004 over 2000. From the year 2005 onwards there has been a considerable growth in merchandise exports registering a 55% growth of in 2011 over 2005. Also, there has been a change in the export market structure, in terms of ranking, during this period. Canada, Germany have lost their place in the top 10 export destinations. Whereas, the position of PRC has increased to 2nd from 4th place. Another key development in the recent past is the growing competition in some of the major export markets for some of the commodities in which NZ has a comparative advantage. For example, Russia and Korea have become strong competitors for timber in China and Japan. Similarly, NZ wine industry faces tough competition from Australia in the UK and USA markets.

This paper investigates the influence of some key export markets as well as changes in competitiveness on the overall growth in merchandise exports during the years 2005 to 2011using shift share analysis. The background and objective of the study is presented in section II. Literature review is presented in section III and section IV explains the methodology. The results of the analysis are presented in section V and section VI concludes.

THE BACKGROUND

A key aspect of the New Zealand's merchandise exports is the changing market structure in the recent years i.e. changing importance of export markets (Table-1). In the year 2005 five of the top 10 destinations were Asian countries accounting for 23% of the merchandise exports. By the year 2011 seven out of the top 10 destinations were from Asia and accounted for 31% of the merchandise exports. This change in the export market structure is a clear indication of the growing importance of Asian markets to the New Zealand economy and the declining share of the European markets. Some highlights of the changes in NZ's export markets are presented below.

Australia has emerged as New Zealand's most important trading partner in the post CER period indicating a significant growth in bilateral trade flows between the two countries. Currently, Australia accounts for 23% NZ's merchandise exports and about same percent of imports, a considerable growth from the 13% recorded in 1983. During the study period Australia retained its position as New Zealand's top export destination. USA, which was in the second position was replaced by China in 2010. Japan has been relegated to 4th place from 3rd which was taken over by USA. Germany which was in the 7th position in 2005, lost its place from the top 10 markets by 2010. Whereas Indonesia and India which were not in the top 10 list in 2005 have found place in the top 10 export destinations by 2011. Indonesia became the 7th largest export destination in 2007 and remained in the top 10 list by 2011. India's position has been moving up from 13th in 2009 to 7th in the year 2011. The changing structure of the New Zealand's top 10 export markets is presented in Table-1.

A second aspect of NZ's merchandise exports is the changes in commodity composition. The composition of top 10 commodities has also changed in 2011 compared to 2005. Some significant changes are, Mechanical machinery equipment which was in 4th place in 2005, has been relegated to 7th place by 2011. Aluminium and Aluminium articles from 7th to 8th, Electrical machinery and equipment from 8th to 10th place. Whereas milk powder, butter, and cheese, meat and edible offal, logs, wood and wood articles retained their respective positions of 1,2, and 3 of the top 10 commodities which were in the top 10 category in 2005. A key development during this period is that by 2011 crude oil occupied 4th place and wine 9th place. Both these commodities were not in the top 10 list in 2005. Two of the top 10 commodities in 2005 *viz*, wool, paper & paperboard lost their place in the list. Crude oil and wine have joined the list in 2011 (Table-1). In 2011, 7 out of 10 top commodities were land based as against 6 out of 10 in 2005 highlighting the dominance of primary products in NZ's merchandise exports.

TABLE-1: TOP 10 EXPORT DESTINATIONS & TOP 10 COMMODITIES-RANKINGS

Year	2005	2011	Year	2005	2011
Country			Commodity		
Australia	(1)	(1)	Milk powder, Butter and Cheese HS Code 0401-0406	(1)	(1)
USA	(2)	(3)	Meat and Edible Offal HS Code 02	(2)	(2)
Japan	(3)	(4)	Logs, Wood and Wood articles HS Code 44	(3)	(3)
U K	(5)	(6)	Crude oil HS Code 2709		(4)
Korea	(6)	(5)	Mechanical Machinery and Equipment HS Code 84	(4)	(7)
PRC	(4)	(2)	Fruit &Nuts HS Code 0803-0814	(5)	(5)
Germany	(7)	(13)	Fish HS Code 03	(6)	(6)
Hong Kong (SAR)	(10)	(12)	Aluminium and Aluminium articles HS Code 76	(7)	(8)
Taiwan	(8)	(8)	Wine HS Code 22		(9)
Malaysia	468 (11)	875 (9)	Electrical Machinery and Equipment HS Code85	(8)	(10)
Canada	(9)	(18)	Wool HS Code 51	(9)	
Indonesia		(10)	Paper and Paperboard HS Code 48	(10)	
India		938 (7)	I		

Source: Statistics New Zealand.

For the purpose of this study only the top six destinations consisting of Australia, PRC, Japan, Korea, USA, and UK have been considered. (Table-2) as they account for about 90% of NZ's merchandise exports. Accordingly, the top 10 commodities exported to these selected destinations have been included (Table-3). These countries also appear in the list of top 10 destinations in 2005 as well as in 2011 but their rankings have changed.

TABLE 2: NZ'S TOP 10 (SELECTED COMM.) EXPORTS TO SELECTED (TOP 6) destinations (US$ m) (2005)

Destination(j)	**Total**	Aus	USA	Japan	UK	Korea	PRC
Commodity(i)							
Milk powder, Butter and Cheese HS Code 0401-0406	**971**	177	295	188	36	57	218
Meat and Edible Offal HS Code 02	**1729**	19	809	265	405	199	32
Logs, Wood and Wood articles HS Code 44	**1226**	273	313	376	1	154	109
Crude oil HS Code 2709	**256**	200	0	56	0	0	0
Mechanical Machinery and Equipment HS Code 84	**731**	448	202	12	42	11	16
Fruit &Nuts HS Code 0803-0814	**421**	49	74	168	86	40	4
Fish HS Code 03	**472**	115	144	109	12	25	67
Aluminium and Aluminium articles HS Code 76	**655**	76	92	407	20	45	15
Wine HS Code 22	**245**	59	71	4	111	0	0
Electrical Machinery and Equipment HS Code85	**433**	191	133	20	63	6	20
Total	**7,139**	**1,607**	**2,133**	**1,605**	**776**	**537**	**481**

Source: Statistics New Zealand (**UNCOMTRADE**)

TABLE 3: NZ'S TOP 10 (SELECTED COMM.) EXPORTS TO SELECTED (TOP 6) destinations (US$ m) (2011)

Destination(j)	**Total**	Aus	USA	Japan	UK	Korea	PRC
Commodity(i)							
Milk powder, Butter and Cheese HS Code 0401-0406	**2882**	381	341	285	25	118	1732
Meat and Edible Offal HS Code 02	**1930**	36	851	252	515	154	122
Logs, Wood and Wood articles HS Code 44	**1941**	328	160	323	2	264	864
Crude oil HS Code 2709	**1515**	1455	0	0	0	60	0
Mechanical Machinery and Equipment HS Code 84	**699**	451	156	15	41	9	27
Fruit &Nuts HS Code 0803-0814	**545**	88	77	233	35	54	58
Fish HS Code 03	**627**	184	138	98	9	35	163
Aluminium and Aluminium articles HS Code 76	**807**	89	58	493	47	100	20
Wine HS Code 22	**693**	264	180	9	229	1	10
Electrical Machinery and Equipment HS Code85	**499**	274	126	22	31	16	30
Total	**12,138**	**3,550**	**2,087**	**1,730**	**934**	**811**	**3026**

Source: Statistics New Zealand (**UNCOMTRADE**)

Thus, there is a clear indication that during the period of study there has been an overall increase in NZ's merchandise exports in 2011 over 2005, changes in the market structure as well as commodity composition. This paper applies shift-share analysis to assess the contribution of a global component (GLOBO) indicating changes due to overall growth in world trade, a geographical component (GEO) indicating changes due to the country's distribution of trading partners, a

product composition component (COMPO) indicating growth due to the mix of products exported, and a residual term indicating changes in competitiveness, or performance (PERFO). The first 3 components, GLOBO, COMPO and GEO all relate to what the change in trade would be if trade changes proportionally. The fourth and residual component, PERFO, refers to the trade that "shifts away" from expected proportional changes, hence the term *shift-share analysis* (*Piezas-Jerbi and Nee 2009)*.

LITERATURE REVIEW

Shift share analysis is a popular method used in economic studies to identify the sources of differences in regional and national economic, employment and export growth rates. Berzeg (1978) in his study on the empirical content of shift share technique concluded that the technique has been one of the main tools to analyse not only growth rates by region and industry but also to study other economic problems. Relative simplicity and reasonable accuracy are the two main reasons for the popularity of this technique. Nazara and Hewings (2004) attributed the technique's wide usability to its ability to capture the underlining changes in the variables under consideration. Shi and Yang (2008) observed that although the shift share technique is relatively simple requiring modest amounts of data the analysis is reasonably accurate. That the technique is versatile, in that it can be used to study a variety of economic issues is well established in economic literature.

Tu and Sui (2011) applied shift share analysis to investigate the regional patterns of structural transitions and contributing factors behind the changes in the state of Texas. They found that the emergence of an information economy may precipitate further spatially differentiated growth in different regions of the state. Robson (2008) applied the shift share analysis to decompose the employment growth in South East Queensland during the decade 1991-2001. He found that most of the growth in employment came from national growth while changes in regional industry mix contributed the smallest portion of the employment growth.

Shift-share analysis is also extensively used to analyse various aspects of a country's export performance. The method can be used to measure the changes in the export competitiveness, the relative gains or losses of export markets and the changes in export performance due to the country's distribution of trading partners. Shift-share analysis can also be applied to identify market potential and growth in a region and to identify the best market for a specific product. The technique is appropriate for the initial screening phase of the export opportunity identification process. The analysis provides a representation of changes in import growth or decline, and it is useful for targeting countries that might offer significant future opportunities (Rubin 2005).

Srivatsava (2010) applied shift share analysis to assess the impact of the phase-out of the Multi-Fibre Agreement on the exports of textile products by India during the years 1996-2006. He noted that when applied to the study of export growth, shift –share analysis measures the relative gain or loss of export markets to overall export growth. The net shift in export is a better measure of export market performance compared to absolute and relative changes in export growth. Shift share analysis also takes into account both size and growth of a particular market when assessing its export performance with another market.

Peh and Wong (1999) applied shift share analysis to study Singapore's export market growth during 1991-96. They computed the net shifts in export markets by analysing the industry mix, regional, and interaction effects. They concluded that the regional economies played a significant role in expanding Singapore's exports during the study period.

The technique can also be used to compare the export performance of a country in relation to a particular industry *vis a vis* its rivals in a major export market. Wu and Kumarapathy (1998) used shift share analysis to analyse Singapore's competitiveness in electronic exports to the United States. They found that although there was an improvement in Singapore's overall competitiveness, it lagged behind its regional rivals i.e. Malaysia, China and the Philippines.

Ballingall and Briggs (2001) compared Australia's and New Zealand's export performance during three time periods 1970-85; 1985-1993, and 1993-99. The three variables considered include the growth in world trade, commodity composition, and competitiveness. It was found that Australia's competitiveness increased since 1985 whereas New Zealand's competitiveness decreased during the same period. In this study a new component viz., GEO is added to evaluate the effects on NZ's total merchandise exports that can be attributed to the distribution of trading partners in addition to the above three components.

METHODOLOGY

This study applies the methodology used by PIEZAS-JERBI and NEE (2009).

In their study of *Market Shares In The Post-Uruguay Round Era* an extended shift share analysis was used to decompose the growth in exports to four components viz., a global component (GLOBO) indicating changes due to overall growth in world trade, a geographical component (GEO) indicating changes due to the country's distribution of trading partners, a product composition component (COMPO) indicating growth due to the mix of products exported, and a residual term indicating changes in competitiveness, or performance (PERFO). The advantage of this method is that it is possible to clearly identify the trading partner effect on the export performance.

$$V'.. - V.. = \Sigma i \Sigma j\ rijVij + \Sigma i \Sigma j\ (V'ij - Vij - rijVij)$$

$$= rV.. + \Sigma i(ri - r)Vi. + \Sigma i \Sigma j(rij - ri)Vij + \Sigma i \Sigma j(V'ij - vij - rijVij)$$

(1) (2) (3) (4) (*Piezas-Jerbi and Nee 2009)*

Where:

Vi. = the value of country A's exports of product i in period 1,
V'i. = the value of country A's exports of product i in period 2,
V.j = the value of country A's exports to country j in period 1,
V'.j = the value of country A's exports to country j in period 2,
Vij = the value of country A's exports of product i to country j in period 1,
V'ij = the value of country A's exports of product i to country j in period 2,
r = percentage change in world exports between periods 1 and 2,
ri = percentage change in world exports of product i between periods 1 and 2,
rij = percentage change in world exports of product i to country j between periods 1 and 2.

RESULTS AND DISCUSSION

NZ's total exports of top 10 commodities increased by US$ 4,999m i.e. a 70% increase in 2011 over 2005. The final result of the shift-share analysis which is used to disaggregate the total increase in exports are presented below (refer to appendix-1 for detailed calculations).

4,999 = 5712 - 266 - 1462 + 1015
100% = (114)% - (5%) - (29%) + (20%)
(Globo) (Compo) (Geo) (Perfo)

The *Globo* component indicates that NZ's exports would have been114% of the total increase had the actual growth rate was equivalent to world growth rate. The results indicate that the growth in NZ's exports was largely due to growth in world exports implying a substantial rise in the global demand for these commodities overall during the study period.

The second term of the equation *Compo* indicates that the composition of exports contributed a negative 5% to the overall exports i.e. the mix of the commodities exported had a negative effect on the export growth. This is the per cent share of exports lost due to global behaviour of the individual commodity groups. A contributing factor is the fact that NZ's growth rate in high value added products such as aluminium articles, electrical machinery, and mechanical machinery has been far less than the world growth rate (Talbe-4).

The third term *Geo* i.e., the distribution of trading partners also had a negative influence on NZ's exports. The decomposition of the total increase in exports shows that 29% share of the exports was lost due to the behaviour of the six individual trading partners.
Finally, the residual term *Perfo* had a 20% positive influence on the total exports implying that NZ's exports increased by 20% due to competitiveness.

CONCLUSIONS

Firstly, there was an overall increase in the exports of selected commodities by the selected countries *albeit* of varying degrees during the period of the study (Table-4). There has been a 70% increase (the second highest) in NZ's exports of the selected commodities to the selected destinations (Table 2 & Table 3) as against 80% increase in world exports of the selected commodities during the study period. PRC achieved the highest growth rate of 109% (Table-4). Seconldy, with regard to individual commodities NZ recorded the highest export growth rate of 492% as against world's 53% for crude oil followed by milk powder, butter and cheese. Other commodities that exceeded the world growth rate are wine with a growth rate of 183% as against world's growth rate of 25%, dairy products achieved 197% increase and timber also exceeded the world growth rate. All these commodities are primary or land based products i.e. NZ's export growth of land based products is comparable to world's growth rate. A point to be noted in this regard is the fact that world's largest growth rate of 120% relates to Electrical Machinery and Equipment for which NZ recorded a 15% growth rate which is far less than the world growth rate. This is an indication that NZ lacks competitiveness in technology based exports. This is also evident from the fact that composition of commodities had a negative effect indicating that the world growth rate for these commodities was less than the overall world growth in exports. Thirdly, the distribution of trading partners had a negative impact as the growth rate of exports of selected commodities to these destinations was less than the overall world export growth rate of these commodities. Some of these countries which are in NZ's top 6 export destinations such as the US are also major exporters of similar commodities e.g. dairy, meat, timber and aluminium articles (Table-5). Given this the Geo component can be expected to be negative unless there is a change in NZ's export market structure. Finally, although the term Perfo had a positive influence, Perfo is an indicator of competitiveness in a broad sense. This is because the term merely indicates a country's potential to increase its exports beyond what can be attributed to *Globo, Compo,* and *Geo* effects (*Piezas-Jerbi and Nee, 2009)*. To conclude, the decomposition of the *Globo, Compo, Geo*, *and Perfo* indicate that NZ was competitive enough to be able to increase its exports in line with world exports. Further research needs to be done on the impact of macroeconomic policies e.g. foreign trade policies to isolate their influence on the *Perfo* term.

TABLE-4: WORLD* GROWTH RATE IN TOP 10 COMMODITIES 2005-2011

Year / Commodity	2005 (US$ m)	2011 (US$ m)	% Change
HS0401-0406 Milk powder, Butter and Cheese	7737	16865	118
HS02 Meat and Edible Offal	16309	29748	82
HS44 Logs, Wood and Wood articles	15546	23620	52
HS2709 Crude oil	28378	43329	53
HS0801-14 Fruit &Nuts	9139	17257	89
HS03 Fish	12976	23203	79
HS76 Aluminium and Aluminium articles	25031	46871	87
HS2204-05 Wine	3923	4918	25
HS85 Electrical Machinery and Equipment	404953	890049	120
HS84 Mechanical Machinery and Equipment	543107	864660	59

Source: UNCOMTRADE *Consists of NZ, Aus, Japan, Korea, PRC, USA and UK.

TABLE-5: TOTAL EXPORTS BY SELECTED DESTINATIONS 2005-2011

Destination (j) / Product (i)	Percentage change. % (r)							
	Total	NZ	Aus	Japan	Korea	PRC	USA	UK
Total (7)	**80**	**70**	**26**	**28**	**55**	**109**	**24**	**2**
HS0401-0406 Milk powder, Butter and Cheese	118	197	26	0	0	0	394	73
HS02 Meat and Edible Offal	82	12	0.36	0	0	0	228	26
HS44 Logs, Wood and Wood articles	52	58	21	7	0	38	99	(-)32
HS2709 Crude oil	53	492	103	0	0	(-)14	0	(-)36
HS0801-14 Fruit &Nuts	89	29	39	0	0	59	56	0
HS03 Fish	79	33	(-)8	(-)5	88	78	26	251
HS76 Aluminium and Aluminium articles	87	23	24	33	21	85	141	(-)21
HS2204-05 Wine	25	183	(-)25	0	0	0	79	(-)14
HS85 Electrical Machinery and Equipment	120	15	26	9	57	110	7	(-)6
HS84 Mechanical Machinery and Equipment	59	(-)4	32	46	52	117	15	20

Source: Calculations based on UNCOMTRADE database.

APPENDIX-1

Calculation of classic shift-share, NZ total exports of top 10 commodities, 2005-2011 (US$m)
Total change in NZ's exports of top 10 commodities = V"-V = 12,138 - 7,139 = 4,999
(1) GLOBO = r*V = (80/100*971) + (80/100*1729)…… + (80/100*433) = 5,712
(2) COMPO = ∑ (ri-r)Vi = (1.18-.8)*971 + (0.82-0.8)*1729…….+(0.59-0.80)*433 = (-) 266
(3) GEO = ∑i∑j(rij-ri)Vij = (0.26-1.18)*177 + (3.94-1.18)*295 ……+ (0.20-0.59)*42 = (-)1462
(4) PERFO = ∑i∑j(V'ij-Vij-rijVij) = (381-177) - (0.26*177) + (36-19) - (0.004*19)…… + (30-20) – (1.10*20) = 1015

(1) GLOBO = r*V = (80/100*971) + (80/100*1729) + (80/100*1226) + (80/100*256) +
(80/100*731) + (80/100*421) + (80/100*472) + (80/100*655) +
(80/100*245) + (80/100*433) = 5,712
(2) COMPO = ∑ (ri-r)Vi = (1.18-.8)*971 + (0.82-0.8)*1729 + (0.52-0.80)*1226 + …
(0.53-0.80)*256 + (0.89-0.80)*731 + (0.79-0.80)*421 +
(0.87-0.80)*472 + (0.25-0.80)*655 + (1.20-0.80)*245 +
(0.59-0.80)*433 = (-) 266
(3) GEO = ∑i∑j(rij-ri)Vij = (0.26-1.18)*177 + (3.94-1.18)*295 + (0.73-1.18)*36 +
(0-1.18)*188+ (0-1.18)*57 +(0-1.18)*218 = 89
= (.004-.82)*19 + (2.28-0.82)*809 + (0.26-0.82)*405 +(0-.82)*265 +
(0-.82)*199 + (0-0.82)*32 = 532
= (0.21-0.52)*273 + (0.07-0.52)*376 + (0.38-0.52)*109 +
(0.99-.52)*313+ (0-.52)*154 = (- 203)
= (1.03-.53)*200 + (0-.53)*56 = 70
= (0.39-0.89)*49 + (0.59-0.89)*4 + (0.56-0.89)*74 +(0-.89)*168 +
(0-.89)*86 +(0-.89)*40 = (-312)
= (-.87)*115 + (-0.84)*109 + (0.88-0.79)*25 + (0.78-0.79)*67 +
(0.26-0.79)*144 + (2.51-0.79)*12 = (-)246
= (0.24-0.87)*76 + (0.33-0.87)*407 + (0.21-0.87)*45 +(0.85-0.87)*15 +
(1.41-0.87)*92 +(-21.87)*20 = (-685)
= (-.5)*59 + (0.79-0.25)*71 + (-0.39)*111 + (0-.25)*71 = (-52)
= (0.26-1.2)*191 + (0.09-1.2)*20 + (0.57-1.2)*6 + (1.10-1.20)*20 +
(0.07-1.20)*133 + (-1.26)*63 = (-437)
= (.32-.59)*448 + (.46-.59)*12 + (.52-.59)*11 + (1.17-0.59)*16 +
(0.15-0.59)*202 + (0.20-0.59)*42 = (-219)
= (-)1462
(4) PERFO = ∑i∑j(V'ij-Vij-rijVij)
Aus = (381-177) - (0.26*177) + (36-19) - (0.004*19) + (328-273) - (0.21*273) + (1455-200) - (1.03*200) + (451-448) - (0.32*448) + (88-49) - (0.39*49) + (184-115) - (-.08*115) + (89-76) - (0.24*76) + (264-59) –
(-.25*59) + (274-191) -(0.26*191) = 1427
USA = (341-295) - (3.94*295) + (851-809) - (2.28*809) + (160-313) - (0.99*313) + (156-202) - (0.15*202) + (77-74) - (0.56*74) + (138-144) - (.26*144) + (58-92) - (1.41*92) + (180-71) - (0.79*71) + (126-133) - (0.07*133) = (-3353)
Japan = (323-376) - (0.07*376) + (15-12) - (0.46*12) + (98-109) - (-.05*109) + (493-407) - (0.33*407) + (22-20)-(0.09*20) = (-135) (285-188) + (-13) + (233-168) (5) = 19
UK = (25-36) - (0.73*36) + (515-405) - (0.26*405) + (41-42) - (0.20*42) + (9-12) - (2.51*12) + (47-20) - (-.21*20) + (229-111) - (-.14*111) + (31-63) + (-.06*63) = 14
Korea = (35-25) - (0.88*25) + (100-45) - (0.21*45) + (16-6) - (0.57*6) (118-57) + (154-199) + (264-154) + (60) + (14) = 241
PRC = (1732-218) + (122-32) + (864-109) - (0.38*109) + (27-16) - (1.17*16) + (58-4) - (0.59*4) + (163-67) - (.78*67) + (20-15) - (0.85*15) + (10) + (30-20) - (1.10*20) = 2667
=1015

PS: Values have been adjusted to the nearest million.

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INCREASING INTERNATIONAL COLLABORATIONS IN SCIENCE AND TECHNOLOGY AROUND THE WORLD, AND ITS PATTERNS IN INDIA WITH SPECIAL REFERENCE TO INDO-GERMAN COLLABORATION

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ABSTRACT

In the present global context, higher education is increasing getting internationalized in the past decade or so. A good proportion of students prefer to study abroad, this growth is the result of several factors, which are many a times inter-related; a desire to promote mutual understanding; the migration of skilled workers in a globalised economy; the desire of the institutions to generate additional revenues; or the need to build a more educated workforce in the home countries. Various reasons and explanations have been provided in order to explain the increasing international collaboration in science and technology. Not a single model that has been propounded so far can provide a complete explanation of the ongoing increase in international collaboration independently, yet each one of these models contains an element of reality. In case of India, within last decade or so it has witnessed a tremendous increase in its output of scientific publications. The rise is really impressive given the fact that in 1981, India accounted for just above 14,000 papers. It increased to 30,000 in 2007 which constitutes an increase of roughly 80% in seven years from 2000 (Global Research Report 2009). Further we have noticed that there has been an impressive increase in India's international collaboration both with developed and developing countries. U.S.A, Germany & U.K being the top three collaborators of India, yet when we look at other seven countries in top ten collaborating countries we find that it contains many developing countries of the periphery like Brazil, Russia, South Africa etc. We reach similar conclusions when we analyse the top ten organisations collaborating with India in science and technology. Finally when we probe into the collaboration between India and Germany, we find that even after being 2nd top most collaborator of India, both countries are trying to increase their collaborations by taking various initiatives and tailor-making of policies. Here also we find that both countries have their own areas of specialisation and hence can avail various benefits by collaborating with each other.

KEYWORDS
international collaborations, science & technology, Indo-German collaboration.

I. INTRODUCTION

Thomas Friedman (2007) said the world was flat – by which he means that "we are connecting all the knowledge centres on the planet together into a single global network". Higher education has become increasingly international in the past decade as more and more students choose to study abroad, enrol in foreign educational programmes and institutions in their home country, or simply use the Internet to take courses at colleges or universities in other countries. This growth is the result of several different, but not mutually exclusive, driving forces: a desire to promote mutual understanding; the migration of skilled workers in a globalised economy; the desire of the institutions to generate additional revenues; or the need to build a more educated workforce in the home countries, generally as emerging economies etc. Recent years, have witnessed enormous and consequential increase in international student mobility. Nearly 3 million students now study outside their home countries, a number that has risen steeply in a short period. From 1999 to 2009 alone, the number of students studying outside their home nations increased by 57 percent, according to UNESCO (United Nations Educational, Scientific and Cultural Organization) and OECD data reported by the Institute for International Education (IIE).

Governments of every nation, along with universities and companies all over the world actively engage in the development of science and technology to survive in the new environment of a knowledge-based economy. Hence, the use of science and technology for national, local, or organizational wealth creation is a universal phenomenon. Research has become a global activity and the cross border collaboration is increasing tremendously. Spending on science based research initiatives around the world has increased by about 45 percent, which has exceeded to more than one trillion U.S dollars since 2002. Taking 2008 as reference, 218 countries have generated more than 1.5 million research papers, with contributions ranging from Tuvalu's one paper to the U.S's 320,000 papers. Both in terms of investment and research publications USA is way ahead of all other countries, with investment at whopping $ 400 billion, while its publications account for worlds 21%. However, the recent increase in research publications have come from the developing world viz-a-viz China, India, brazil and South Korea. Also, the paradigm alteration that the world has witnessed from past two decades or so has been the increase in international collaborations among researchers from different countries, which amount for an impressive 35%. The number of internationally co-authored publications has more than doubled since 1990. The top hubs of international collaborations in science research continue to be lead by USA, followed by U.K, France and Germany. Researchers in other developed and developing countries have more actively been collaborating with scientists from these research hubs. According to the Royal Society report, "while links between the BRIC countries (Brazil, Russia, India and China) have been growing in recent years, they fade in comparison to the volume of collaboration between these individual countries and their partners in the G7" (Global Science Research).

A July 2007 study by Britain's Office of Science and Innovation, for instance, found that in 2001–5, the percentage of papers by American scientists written with co-authors from other nations rose to 25 percent, up from 19 percent during the 1996–2000 period. The degree of international collaboration rose even more in Britain, growing from 29 to 40 percent between the two periods. Another study, which examined 2.4 million scientific papers written at 110 leading American research universities from 1981 to 1999, found increased collaboration in general—as scientific teams grew larger—as well as a greater degree of international collaboration (Wildavesky, 2010). Cozens et al(2011) mention that the most recent data on international co-authorship of published research show that articles with two or more collaborating countries are the fastest growing segment of the world's scientific publications. The United States and European Union countries collaborate less internationally than would be expected based on their number of publications, but Asian countries collaborate more than would be expected, and a new intra-Asian zone of collaboration is emerging. Collaboration between Asian countries has increased in recent years even without the kind of encouragement the European Commission has provided in an attempt to build collaborations within that region (National Science Board, 2010 cited in cozens et al, 2011).

This paper is an attempt to study the international collaboration in science and technology. Section I provides a brief account of recent increase in international research collaboration globally. Section II provides the conceptual framework and rationale for studying the international collaboration in research. Section III

describes India's international collaboration in science and technology and tries to show the diversity of India's collaborative research. Section IV explains the indo-German collaboration in science and technology in details for a period of 2004-09, Germany being a second most productive partner of India in collaborative research. Finally section V provides the concluding remarks of the paper.

II. CONCEPTUAL FRAMEWORK AND RATIONALE

In a networked global environment in which every university is visible to every other, and the weight of the global dimension is increasing, it is no longer possible for nations or for individual higher education institutions to completely seal themselves off from global effects (Marginson and Van der Wende,2007). Research has become a global activity and the cross border collaboration is increasing continuously. Over past years, a number of reasons have been suggested to explain the growth of international collaborations.

Hwang talks about the re-enactment of colonialist discourse which provides an understanding of the hierarchical structure of international relations in science. The basic premise in this contains the notion that sociocultural elements, such as nationality, scientific heritage, and infrastructures,predetermine the status of an individual scientist and engineer,or an individual institution that stands in the core or periphery in the hierarchicalstructure of international relations.Traweek(1988, cited from Hwang 2008) states that there exists a stable ranking of institutionsin particle physics, internationally, and that all the major and eminentlaboratories for particle physics in the world are located in North Americaand Europe (1988, 109). This is well documented for big science, such asparticle physics, and it seems likely that this holds for other areas of scienceas well. Zaltman (1968, cited in Hwang 2008) and Crane (1972, cited in Hwang 2008) mention that United States and the European countries have dominated the international scientific community networks. Rothboeck (cited in Hwang 2008) is also notoptimistic about whether the workings of the Information and CommunicationTechnologies (ICT) industry enable some latecomers to move into thegroup of pace-setting countries and argues that empirical evidence showsthat the ICT industry seems to maintain the divisions between the core andthe periphery (2000, 55).Arrow (1962, cited in Hwang 2008) is of the view that knowledge is not simply the end product of inventiveactivity but also a major input into the process of new knowledge creation. Periphery scientific endeavour is reliant on the provision of this knowledge, which it consumes but doesnot produce itself: its output—technological application—is seen as beinginferior, even parasitical. When a country seen as peripheral is in fact, producing some core knowledge, that activity may be prejudged in the lightof this assumed lower status.

Schott (1998), following Ben-David (1971) and Shils (1983), explains international collaborationby ties between centre and periphery[2] in the scientific world system. He argues thatCountries at the periphery (often smaller countries) emulate the organisation, orientation, and excellence of scientific work at the centre. As they emulate and adapt the practices of the core country, the capacities of the peripheral countries grow. He states that during the twentiethcentury, the region that attracted most deference and became most centralin the network of deference is evidently North America, and the second-mostcentral region in this network is Western Europe, while other regions areperipheral.The network of deference is a particularly important concept for internationalcollaboration in that scientific actors from the periphery try to haveconnection with the centre in various collaborative ways, such as sojourningfor education and training, knowledge transfer, andinformal networks. This connection between centre and periphery in the viewof scientific actors from the periphery is closely related to their recognition,reward, emulation, and competence as scientific actors at both global andlocal levels. Schott states, "In peripheries of the world of learning, a sojournto the centre is a credential in itself, enhancing prestige of the sojourner, andin some peripheral countries it is even somewhat necessary and sufficientcondition for certain appointments" (cited in Hwang 2008). Collaboration betweensupervisors and research students, and formal and informal collaborationand close relationships between them after students' education, are not newphenomena, and this applies to educational sojourners fromperiphery to centre (Schott 1998 cited in Hwang 2008). Thus, sojourners fromperiphery to centre promote international collaboration.However, the theoretical concept of colonialist discourse is too dichotomousto apply to the multilayered structure of the real world (Hwang 2008),and this suggests a problem with the centre-periphery notion: there isa middle or gray area that belongs to neither the centre nor the periphery.Wagner and Leyderoff are of the view that dynamics of centre-periphery may have been at work in the past, but the data on international collaboration presented for the decade of the 1990s suggests that the centre-periphery model of international scientific collaboration can be replaced with a model that accounts for various centres that both collaborate among and compete with one another for partners from smaller national systems. A core group of scientifically advanced countriesis both competitive and highly related. At the lowest levels of the hierarchy, smaller, more peripheral countries are more likely to link to the international network through regional hubs rather than through an advanced country.

Some scholars tried to explain the international collaboration in science and technology increase in interdisciplinary and multidisciplinary in science. Multidisciplinary collaboration is a mode of producing integrated knowledge from different areas. Sophistication of equipment and sharing rare and expensive instruments, especially in big science, such as high-energy physics and astronomy,inevitably require collaboration. Thus, interdisciplinary application and manipulating and building equipment are the main determinants of collaboration in the category of the scientific content (Hwang, 2008). However this notion has been criticised in Wagner &Leydesdorff (2003, cited in Wagner & Leydesdorff 2004) examining disciplinary linkages in the field of geophysics and the more specialized subfield of seismology cannot support this assertion. Although the subfield of seismology is more specialized, geophysics remains the more highly internationalised of the two fields. Moreover, it has been observed that growth in International Collaboration occurs across all fields of science, not just those that are highly specialized. Furthermore it is also argued that financial demands or cost sharing of "big science" or "mega science" alone cannot explain the international collaboration completely.

Beaver and Rosen (1978, cited in Wagner and Leydesdorff 2004) suggest that collaboration grew historically as science became "professionalised"—taking place in dedicated institutions of science. Using a historical, nationally-based approach, they show that "collaboration becomes a mechanism for both gaining and sustaining access to recognition in the professional community" (1978). They claim that collaboration is neither a historically recent phenomenonnor that it is principally a response to specialisation. Collaboration is intrinsically advantageous to scientists, they argue, particularly when it occurs between a "master" and an "apprentice." Wagner and Leydesdorffare of the view that it is difficult to compare this with data at the global level, yet this theory can be helpful in understanding the dynamics at the sub-field level.

Hwang (2008) is of the view that scientific networks can also provide general explanation that what compels scientists to collaborate, without considering the scientific content as such. This category includes insecurity in highly competitive environments, uncertainty of scientific findings, social networks of collaborators (e.g., previous supervisor, previous research team members, core set in controversies), and career seeking. Hwang argues thatscientists use formal and informal contact with other scientists to obtain information on other scientists' research for their knowledge production. Collaboration is a salient source of scientists' social contact because it provides intensive communication, which can offer scientists research ideas and information on similar research. Thus, scientists predominantly need to participate in social networks for obtaining information. Collaboration is one of the ways that scientific actors are involved in social networks.

Some have suggested that the availability of the Internet is causing a growth in international collaboration. While Internet and information technology generally are important factors, research shows that nearly all collaborations begin with a face-to-face meeting (Laudel 2001 cited in Wagner &Leydesdorff2004). Once collaboration is underway, researchers use the Internet to exchange data and text, but the majority of collaborations begin in the richer communication environment provided at conferences or research sites. This suggests the information and communications technology cannot be considered as a driver for the initiation of collaboration, only as a facilitating agent.(Wagner & Leydesdorff 2004)

Hwang (2008) also mentions that extraneous factors inextricably linked with scientific content and scientists' networks can also explain the increase in scientific collaboration. This category pertains to contextual changes including social changes, Scientific capacity including international reputation and recognition (Ben-David 1971, Wagner and Leydesdorff 2004), political and policy promotion including governments' fostering of international collaboration (Wagner et al. 2001 cited in hwang), historical factors including geographic proximity and colonial relationships (Zitt, Bassecoulard, and Okubo 2000 cited in Hwang), and

[2]Wallerstein's world systems framework, visualizing the world into a system of core and periphery's, that are linked to each otherby a network of unequal exchanges.

globalization of science and technology (Gibbons et al. 1994; Wagner and Leydesdorff 2003) are all social context factors influencing general collaboration as well as international collaboration.

Given the fact above mentioned factors donot explain the increase in collaboration completely, Wagner and Leydesdorff (2004) maintain that international co-authorships within fields of science can be shown to self-organize based on rules of preferential attachment among productive researchers, suggesting that the spectacular growth in international collaborations may be due more to the dynamics at the sub-field level created by individual scientists linking together for enhanced recognition and rewards than to other structural or policy-related factors. They are of the view that choices of individual scientists to collaborate may be said to be motivated by the reward structures of science where co-authorships, citations and other forms of professional recognition lead to additional work and funding in a virtuous circle. Highly visible and productive researchers within the field, able to choose among potential collaborators, choose those most likely to enhance their productivity and credibility. These "continuants" thus mediate the entrance into this network. This creates a competition within a field of science for collaborators.

III. INDIA'S INTERNATIONAL COLLABORATION

In the modern era, science and technology have been central to India's development efforts since the nation achieved independence in 1947. Since then, via government directives such as the Scientific Policy Resolution (1958), the Technology Policy Statement (1983), and Science and Technology Policy (2003), the nation has achieved notable scientific successes.Within a last decade or so India has witnessed a tremendous increase in its output of scientific publications in Thomson Reuters. The rise is really impressive given the fact that in 1981, India accounted for just above 14,000 papers. It increased to 30,000 in 2007 which constitutes an increase of roughly 80% in seven years from 2000(Global Research Report 2009).[3] Nonetheless, the absolute volume for India is still only about half that for countries such as the UK, Germany, China or Japan.

India is collaborating with several developed and developingcountries in S&T over the years. This collaboration has resulted in 46042 papers in six years between 2004 and 2009. United States is the India's largest collaborating partner with 15928 collaborating papers, accounting for 34.59% share in India's total collaborative papers during 2004-09. Germany and United Kingdom is the second and third largest collaborators, having published 5954 and 5769 papers with India and accounting for 12.93% and 12.53% share of India's total collaborativepapers during 2004-09. They are followed by Japan with 4154 collaborative papers (9.02% share), France (3571 papers, 7.76% share), South Korea (2975 papers, 6.46% share), Canada (2644 papers and 5.74% share), Australia (2071 papers and 4.50% share), China (1733 papers and 3.76% share), Russia (1148 papers and 2.49% share), Brazil (1043 papers and 2.27% share) and South Africa (601 papers and 1.31% share).

The diversity of India's research ties is elaborated in Global Research Report 2009, which presents a selection of international organizations that have made especially numerous collaborations with India institutions in 2003-2007. The list is not a complete reflection of just the top ten organizations, but has been selectively edited to give a more diverse flavour to the richness of India's links. Even so, the relative scarcity of European partners—and the absence of UK institutions—will be a surprise to policy observers. The list was topped by university of Tokyo (Japan) with 686 co-authored papers, followed by university of Texas (USA) with 642 co-authored papers. They were followed by Tohoku university (Japan 639 papers), centre national de la recherché scientifique (France 534 papers), Korea university (South Korea 534 papers), Chinese academy of science (China 533 papers), National Taiwan university (Taiwan 466 papers), National university of Singapore (Singapore 429 papers), University of Melbourne (Australia 423 papers), University of Amsterdam (Netherlands 384 papers).

IV. INDO-GERMAN COLLABORATION IN SCIENCE AND TECHNOLOGY

India has always been a major partner for Germany in Asian region. Although, a more active and holistic R&D collaboration has developed only during the past 30 years, collaboration between Germany and India dates back to the era of 1960's. India and Germany signed Science and Technology Cooperation Agreements in 1971 and 1974. Co-operation in Science and Technology has been earmarked as one of the prime strategic goals for future relations between India and Germany. As a result, an Indo German Commission on Science and Technology, which meets every 18 months, alternately in India and Germany, coordinates the Indo-German cooperation in science and technology Research. TheDST, Government of India, and German Federal Ministry of Education and Research (BMBF), Government of Germany, are the nodal agencies for the implementation of bilateral agreements at the inter-governmental level. Under various Indo-German programs, so far more than 2,000 joint projects have been successfully undertaken, resulting in more than 7,000 short-term/long-term exchanges of scientists, more than 6,000 joint publications and more than 400 Indo-German workshops and seminars.At present, more than 170 joint projects are in progress and the number is on the rise (Matussek, 2011 cited in Gupta & Fischer 2013). Additionally, from 1996 to 2010 (15 years), 11,161 Indo- German joint collaborative papers have been published, based on the Scopus database searched on May 27th, 2011. Within the bilateral umbrella of agreements, a number of special co-operative arrangements have been concluded and activities implemented by a number of agencies from the Indian and German side. Some of the departments and organisations involved from the Indian side are: DST, DBT, DAE, Indian Space Research Organisation (ISRO), CSIR, ICMR, Ministry of EarthSciences (MoES), MNRE, MoEF and Indian National Science Academy (INSA). From the German side, some of the institutions involved are: ForschungszentrumJülich, German Aerospace Centre (DLR), Helmholtz Association (HGF), German Academic Exchange Service (DAAD), Society for Research in Radiation & Environment (GSF), Max Planck Society (MPG), Fraunhofer-Gesellschaft, German Research Foundation (DFG) and the BMBF. To coordinate S&T cooperation, both countries have posted Science Counsellors in their respective Embassies since mid-1980s (Gupta &fischer, 2012).

Recently (Oct 2012) The German House for Research and Innovation (DWIH), established by a 14-member consortium of German organisations, was inaugurated. The DWIH-New Delhi is intended to serve, "as a 'one-stop shop' for Indian researchers, providing information on Germany and its research community, showcasing its strengths and opportunities." The aim is to enhance the cooperation between the two countries in academics and research. It is expected to bring more synergy and joint initiatives between Indian and German institutions and organisations and will form one of the major pillars of the Research and Academic Relations Initiative in India by the German government. It is being jointly sponsored by the German Federal Foreign Office and the German Federal Ministry of Education Research (The Hindu, 2012). Similarly the Indo-German Science and Technology Centre has been established in India with its present office in Gurgaon (Haryana). The Indo-German Science & Technology Centre (IGSTC) is supported by Indian and German governments with equivalent contribution of 2 million euro's per year from German side and rupees 13 crores per year from Indian side for an initial period of 5 years. The Indo-German Science & Technology Centre (IGSTC) is registered as a "Society" under Societies Registration Act (Act XXI of 1860, Punjab Amendment Act 1957) as extended to NCR Delhi. The IGSTC is governed by a Governing Body (GB) having equal members from India and Germany. The IGSTC is steered by an Indian Director to be appointed by GB on nomination by Indian government. The IGSTC shall support mega joint research projects with co-funding from both sides in rupee as well as euro's components and participation of industry from both sides. The objectives of the IGSTC are to play a pro-active role to:

(i) facilitate participation of industry in joint R&D projects; (ii) provide/ assist in mobilizing resources to carry out industrial R&D projects, (iii) facilitate and promote Indo-German bilateral collaborations in basic and applied science, research and technology through substantive interaction among government, academia and industry; (iv) encourage public-private partnerships (PPP) to foster elements of innovation, application and cultivate a culture of cooperation between science and industry; (v) develop cooperation through the identification of scientists and scientific institutions of the two countries etc. (Bureau, Press Information, The Government of India)

The global publication share of Germany in 15 broad subjects varies from 4% (engineering 5th world rank) to 9.36% (physics 4th world rank). On the other hand India's global publications share among 15 broad subjects varies from 1.84% (medicine 9thworld rank) to 5.45% (Chemistry 5THworld rank). Yet there are important fields in which India has shown higher specialisation compared to Germany in terms of rankings such as chemistry, veterinary science, pharmacology, toxicology & pharmaceutics, agricultural & biological sciences etc. At the same time there are other fields where in Germany has shown higher specialisation compared to India in terms of rankingsas physics, public health, neuroscience, biochemistry, genetics & molecular biology, immunology & microbiology,

[3] references have been made in science policy research for India as sleeping giant.

mathematics etc. Thus there are various fields where in the collaboration between the countries can take place and each country can get benefitted from other countries specialised field.

Germany is the second most productive partner collaborating with India in S&T research as reflected in the co-authored papers after USA, accounting for 12.93% publications share during 2004-09. Germany is the second most productive partner in collaborative research with India in nine out of 15 subject areas studied in this paper: physics, materials science, chemistry, biochemistry, genetics & molecular biology, mathematics, earth & planetary sciences, chemical engineering, computer science and energy during 2004- 09. Germany was the third most productive collaborative partner with India in five subject areas, *i.e.* engineering, agricultural & biological sciences, environmental sciences, immunology & microbiology and pharmacology, toxicology & pharmaceutics. In medicine, Germany was the fifth most productive collaborative partner with India during 2004-09. India-Germany overall scientific collaboration, as reflected in their joint co-authored research output during 2004-09 has grown at an average annual growth rate of 6.78%. But, certain broad subject areas have shown higher annual average growth rate in Indo-German collaborative research than the national average of all disciplines (6.78%) during the same period, namely in computer science (23.59%), immunology & microbiology (18.88%), medicine (18.21%), environmental science (17.46%), materials science (16.28%), energy (15.55%), agricultural & biological sciences (14.38%), physics (13.56%) and chemistry (13.22). (Gupta & Fischer 2012)

Physics, material sciences, chemistry and biochemistry, genetics and molecular biology have been found to be most collaborative fields in the Indo-German collaboration, each contributing a publication share between 15.63% and 42.66%. Engineering, agriculture and biological sciences, medicine mathematics and earth and planetary sciences have been rated as medium productivity collaborative fields in the Indo-German collaborative research, each contributing a share between 6.6% and 10.1% during 2004-2009. At the same time the average citations per paper for Indo-German collaborative output for different subjects varied between 0.8 and 11.74 during 2004-09. It was highest (11.74) in medicine, followed by physics(8.44), biochemistry, genetics & molecular biology(6.69) and chemistry(6.22). It was lowest in computer sciences(0.80) and environmental sciences (2.44). (Gupta & Gupta 2011)

In all, 77 German organisations (contributing 20 or more papers) have participated in Indo-German collaborative researchduring 2004-09. Of these 77 German organisations, 47 are universitiesand 30 research institutes and their cumulative contributionaccount for 89.33% and 23.32% share, respectively in totalIndo-German collaborative output during 2004-09. Among the 47 German universities, the largest contribution(351 papers) to Indo-German collaborative research during 2004-09 had been made by Technical University, Darmstadt, followedby Ludwig Maximilians Universität, Münich (305 papers), University of Bonn (301 papers) and RWTH Aachen University, Aachen(288 papers). Among the 30 German research institutes, the largest contribution(143 papers) to Indo-German collaborative research during 2004-09 had been made by Forschungs zentrum Jülich (Gupta & Fischer 2012).

In all, 69 Indian organisations (contributing 20 or more papers)have participated in Indo-German collaborative researchduring 2004-09. Of these 69 Indian organisations, 31 are universities,28 research institutes and 10 institutes of national importance. Among the 31 Indian universities, the largest contribution(416 papers) to Indo-German collaborative research output during2004-09 had been made by Punjab University, Chandigarh,followed by Mangalore University (304 papers). Among the 28 Indian research institutes, the largest contribution(447 papers) to Indo-German collaborative research outputduring 2004-09 had been made by Tata Institute of FundamentalResearch, Mumbai, followed by Bhabha Atomic Research Centre,Mumbai (295 papers). Among the 10 Indian institutes of national importance, thelargest contribution (254 papers) to Indo-German collaborativeresearch during 2004-09 had been made by Indian Institute ofTechnology, Mumbai, followed by Indian Institute of Technology,Kanpur (226 papers) (Gupta & Fischer 2012).

There were 3892 collaborative linkages between top most productive 10 Indian and German organizations during 2004-09. The largest number of collaborative linkages (214 linkages) was between RWTH Aachen University, Aachen and Tata Institute ofFundamental Research (TIFR), Mumbai, followed by 208 collaborative linkages between Technical University, Darmstadt and Mangalore University and 192 collaborative linkages between RWTH Aachen University, Aachen and Punjab University, Chandigarh (Gupta & Fischer 2012).

V. CONCLUDING REMARKS

Thus various reasons and explanations have been provided in order to explain the increasing international collaboration in science and technology. Not a single model that has been propounded so far can provide a complete explanation of the ongoing increase in international collaboration independently, yet each one of these models contains an element of reality. Further we have noticed that there has been an impressive and consequential increase in India's international collaboration both with developed and developing countries. U.S.A, Germany & U.K being the top three collaborators of India (supporting the centre periphery model), yet when we look at other seven countries in top ten collaborating countries we find that it contains many developing countries of the periphery like Brazil, Russia, South Africa etc. (not supporting the centre periphery model). We reach similar conclusions when we analyse the top ten organisations collaborating with India in science and technology. However finally when we probe into the collaboration between India and Germany, we find that even after being 2nd top most collaborator of India, both countries are trying to increase their collaborations by taking various initiatives and tailor-making of policies. Here also we find that both countries have their own areas of specialisation and hence can avail various benefits by collaborating with each other.

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A STUDY ON THE ETHICAL INVESTMENT DECISION MAKING IN INDIAN RELIGIOUS ORGANISATIONS

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ABSTRACT

This paper reports of the findings of stage 1 of a larger study that investigates the effect of culture on the ethical investment decision making process and the necessity for a decision making models for religious organisations in India. In stage 1 a qualitative thematic analysis was conducted on 10 semi- structured interviews with the directors of religious organisations. The aim of Stage 1 was to understand the concept of ethical investment decision making and to inform the need to develop a suitable model for overcoming ethical dilemmas in the Indian religious organisations before a national survey was conducted. The results indicated that the directors in the organisations had similar conceptualisations of ethical decision making to the literature, in that external culture of the organisation are 'highly' influenced in the 'ethical decision making process' of religious organisations. Ethical investment decisions are predominantly made for the beneficiaries/stakeholders. Finally, the majority of directors of the organisations believe an ethical decision making model has to be implemented for overcoming ethical dilemmas in Indian religious organisations.

KEYWORDS

Ethics, ethical decision- making, ethical dilemma, ethical Investments, religious organisations.

INTRODUCTION

There is no consensus for the definition of Ethical investments (Cooper and Schlegelmilch, 1993 & Frankei, 1984). Lewis *et al*. define ethical invest as 'deliberately not investing in companies and funds according to certain negative ethical criteria'. The intrinsic idea of ethics is to distinguish between what is wrong and right in the decision making behaviour in an organisation. The origin of ethical investments can be traced back to 19th cent among the religious groups in the United States. The main intention of these religious groups was to invest according to their morals and to avoid those companies from their portfolio whose conduct were against their morals and values. Research among Not- for – profit organisations have stated the necessity of why religious organisations should be willing to engage is ethical investments (Christian churches in Kreander et al. 2004, the Catholic Church in Palomo et al. 2002). According to Schaefer (2004) ethical investment can be a means of achieving strategic missions for Not- for –Profit organisations. There is an impressive body of literature dealing with ethical decision-making in business (Loe et al.,2000), but curiously there are few, if any, studies specifically addressed at organisations (such as religious organisations) that have this type of explicit ethical mission or image. Previous research conducted on decision making processes in religious organisations has stressed the relationship of the organisation to structural and contextual factors.

LITERATURE REVIEW

Studies have shown that organisational culture is one of the most important factors, if not the most important, influencing ethical behaviour, especially with regard to integrity (Hendershott et al., 2000). In the research conducted by Trevino (1986) he identified individual and organisational influence in the ethical decision- making process. However, Weaver and Agle (2002) in their study they also included cultural and individual influences for examining ethical attitudes and behaviour of individuals within the organisations. In this modern age business decision makers are bound to incorporate ethics in their decision- making process. However tackling ethical dilemmas and ethical decision- making process are not easy. An ethical dilemma is a situation where there is a conflict between different values, ideals, duties and norms (Anderson, 1994; Railton, 1996; Brink, 1996, Donaldson and Dunfee, 1999).

Many investment decisions, whether for business or non-profit organisations, involve competing values. It is clear that the value systems of those designing and making investments within organisations are highly relevant to how those systems operate. Organisations can assign value to different aspects of financial performance, to the environment and to the social impacts of their activity (Epstein & Roy 2001). The outcome of decisions about competing values is often recorded in the books of account (Laughlin 1988, Maali & Napier 2010) and annual reports of the organisation .The requirement to account can itself influence the decision making (Wooten, Coker & Elmore 2003).

Further understanding of how these competing values are handled is needed. This can be aided by the in-depth study of organisations where the interplay of values is clear. Religious organisations fulfil this criterion well, and indeed there has been a growing body of literature describing their financial management (Lightbody 2000, Laughlin 1990). However there has been relatively little literature which looks at the interaction between the internal value system of the organisation and the effect of wider culture in which the organisation works.

OBJECTIVES

Stage 1 involved in-depth interviews with directors of the Christian religious organisations to understand the concept of ethical investments and to inform the need for developing a suitable ethical decision making model for religious organisations in India. Specifically, the purpose of Stage 1 is:

1) To examine how religious organisations define the concept of ethical investments and compare it to the conceptualisation of ethical investments in the literature.
2) To identify which stakeholders are given preference in decision making
3) To explore whether religious organisation decision makers believe culture affect the decision making process

METHODOLOGY

Stage 1 of the larger study was conducted through 10 semi-structured interviews with the Directors of religious organisations in five states in India; Andhra Pradesh, Goa, Karnataka, Kerala and Tamil Nadu. Details of the interviewees can be found in Table 1. The religious organisations were selected to vary in terms of location and culture to ensure the diversity of the sample. This is because the researchers could not discount the possibility that religious organisations in different locations (e.g. large cities, small cities, regional locations) and following different cultural values and also difference in denominations could have differences in terms of their conceptualisation and implementation of ethical investments and decision making. Respondents to the interviews were contacted through snowball sampling, where additional respondents were obtained through recommendations from previous respondents. Respondents were reached through telephone calls, where the purpose of the study was explained and permission was sought to conduct a face-to-face interview. All 10 interviews were conducted on site at the directors' office premises.

TABLE 1: DETAILS OF RESPONDENTS

Organisations Code Name	Location	Type of denomination
Organisation JS	Hyderabad, Andhra Pradesh	Catholic
Organisation RS	Hyderabad, Andhra Pradesh	Protestant
Organisation ES	Panaji, Goa	Catholic
Organisation SA	Margao, Goa	Protestant
Organisation PA	Bangalore, Karnataka	Catholic
Organisation DA	Bangalore, Karnataka	Protestant
Organisation WA	Thiruvananthapuram, Kerala	Protestant
Organisation PBA	Kottayam, Kerala	Catholic
Organisation LRSA	Chennai, Tamil Nadu	Protestant
Organisation KRSA	Chennai, Tamil Nadu	Catholic

Source: Developed by author

The interviews followed a protocol which included a set of vital questions based on the purposes stated in the introduction section of this paper with opportunities for follow-up probes. The length of the interviews ranged between 20 to 45 minutes. All interviews were recorded on a digital voice recorder and transcribed by the researcher. The data was analysed based on steps described by Patton (2002) for handling qualitative data. First, each transcript was read and re-read to immerse the researchers in the data. Themes related to the definition of the ethical investments, stakeholders mentioned and strategies used for resolving ethical dilemmas were identified and coded. The coding system was then evaluated in order to eliminate redundancies and classify them into emerging themes.

RESULTS AND DISCUSSION

Definition of ethical Investments

TABLE 2: DEFINITION OF ETHICAL INVESTMENTS

Theme	Respondents	N Coded events
Means of achieving their strategic missions	PA, PBA, KRSA, JS	4
Activities according to certain values/principles	ES, RS, WA	3
Intangible objectives and values of organisation	DA	2
Investing according to positive ethical criteria	LRSA	1
Product that combines both financial and non-financial criteria	SA	1

Source: Developed by author

Based on the results shown in Table 2, the majority of respondents indicated that ethical investment means 'achieving their strategic missions' (N=4) and 'Activities according to certain values/principles' (N=4). To illustrate, the references for these themes were:

"Ethical investment for us is to achieve the strategic missions on which our organisation vision is based on" (Organisation RS).

"Times change, people change and their views change but the only thing that doesn't change for us are the values and the principles on which the organisation was formed and we strive to stay on them" (Organisation PBA).

Three themes emerged that were unable to be categorised. These were that ethical investment are 'Intangible objectives and values of organisation' (Organisation DA), 'Investing according to positive ethical criteria' (Organisation LRSA) and 'Product that combines both financial and non-financial criteria' (Organisation SA).

The results indicate that Organisation's directors had a similar conceptualisation of ethical investments as the literature. The first element of ethical investment is investing according to strategic missions Schaefer (2004). This is seen in four respondents who incorporated the word 'strategic missions' in their understanding of ethical investments. The researcher also consider respondents who indicated that ethical investment is 'activities based on certain values/principles' (N=3) as referring to the concept of 'values/missions'. This is illustrated in the examples of strategies provided by the organisations (see section 4.3) where the ethical investments were conducted as per the organisations values and principles.

These findings help validate the use of the theoretical conceptualisation of ethical investments for the larger study by confirming that theorists and practitioners have a similar understanding of what ethical investments represents.

Stakeholders mentioned

TABLE 3: STAKEHOLDERS MENTIONED

Theme	Respondents	N Coded Event
Converts/ Believers	RS, ES, PBA, KRSA, WA, LRSA	6
Locals	PA, PBA, KRSA, PA, SA, LRSA	6
Employees	DA, SA, LRSA, WA	4
Missionaries	ES, PA, KRSA, DA	4
Government	JS, ES, KRSA	3
Managers	PBA, PA	2

Source: Developed by author

Directors mentioned their main stakeholders in the interviews who are directly and indirectly affected by the activities of these organisations. The themes that emerged are summarized in Table 3. The two leading stakeholders were 'converts/believers' (N=6) and 'Locals' (N=6). To underline the importance of the coverts/believers as a stakeholder Director of ES organisation mentioned:

"For me, undertaking ethical investments is providing most ethical service to the followers of our traditions. We teach them how to be ethical and what they are meant to do for the world, that's what we work towards. There is no point for us to do something and investing in those sectors which we have told the followers that it is unethical. So majority of our investments are accordance with the suggestions and support of the believers which we compare against to our organisation's principles and ethos."

Locals are also considered as an important stakeholder by most of the organisations. Organisation DA takes a unique approach by spending time with the local community.

"For me, I usually go to the local community and talk to them and understand what they want. Christianity is not just serving the believers but also to serve the rest of the world who are in the heathens that is what Jesus teaches us. So I go to them and spend more time to understand what more we can provide to them as an ethical organisations. Based on that we formulate more activities which can be beneficial for the local communities surrounding us"

Respondents also mentioned 'employees' as their important stakeholder (N=4). The 'missionaries' who worked for the organisations both locally and interstate were also considered as a potential stakeholder (N=4). Interestingly, some respondents credit the 'government' for the support that they receive for their activities (N=3). Organisation ES describes:

"At the end of the day we are supporting the government to reach those groups of people where the government were not able to provide any aid or support. Ultimately we play a role of the messenger between the disadvantage and the government. We also a play an advisory role towards the government for implementing new plans and strategies for empowering people. Ultimately a happy society forms a strong support for the government due to which government also supports our activities".

Finally, in some cases respondents identified that 'employees' within the group are also a potential stakeholders (N=2) as part of their job description they do know that what is organisations ethos/principles as per which they co-ordinate with the organisations activities Lastly, it must be noted that director of the organisations had multiple stakeholders that they had to take into account while making decisions and in some cases have no preference to which stakeholder should be given higher preference.

Culture as a factor influencing ethical decision making.

In the last segment of the interviews, respondents were asked if they believed environmental/cultural factors had affected their decision making process. Seven of the ten respondents explicitly said 'yes' to the question. However, there was some indication that the degree to which it has affected varied between respondents. An example of a respondent who considered culture as being an important factor major influencing decision making process illustrated by:

"With innovation, it's vital actually because as the years go by, you have regular customers who will come back for our most popular products. With that being said, we always need to innovate new ideas especially with new customers that might be coming in so that we can generate possibly more business. So innovation is very vital in business" (Organisation RS)

Other respondents however said 'yes' with a caveat, as illustrated by Organisation ES:

"Innovation has been better, but it's been costly. Not every innovation works out. Sometimes you change five things but maybe one or two will work and you will lose three. Of course it's been better for us but you have to be careful of what risk you are actually taking".

Some also believe that the effect of innovation on performance varies between age groups. For example:

"Innovation has definitely been beneficial. I think nowadays in Australia if you see, a lot of successful businesses are owned by the younger generation. The older generation is definitely still there but the businesses that are doing well and expanding are managed and run by people in their twenties, thirties and maybe early forties. I think the key factor is because they are using the internet much better and they know the types of restaurant concepts the younger generation wants. This is an advantage because this age group spends the most money. The older generation, to make money they cut costs. Whereas for me, I always do the opposite. I have to spend more money to make more money. So I buy newer and better equipment for more efficiency, and spend more money on retaining staff rather than cutting costs because better staff will provide a better return on your business. That's my thinking" (Restaurant JS).

Lastly, even if innovation is not actively pursued by a restaurant owner, it is still needed from time to time as illustrated by Restaurant WA:

"Change is a need from time to time to suit demands. That's what I think. But for us, if we don't have to change that much and maintain what we have, that would be the best. But if the market needs us to change then we have to change and follow the trend".

Overall, regardless of the size of the effect, eight out of the ten respondents interviewed stated that innovation was beneficial to increasing business performance. The results show that innovation is an important antecedent to business performance. This seems to indicate that in line with literature in other industries (refer section 2.3) innovation is also an antecedent of business performance in the restaurant industry.

CONCLUSION AND IMPLICATION

Directors in the Christian organisations have a similar conceptualisation of ethical investments as theorists of ethical investments. Directors of the organisations perceive ethical investments as being something 'investing strategically' which has to be 'based' on organisation's values/principles. This similarity ensures that there is no gap in the understanding of ethical investment between theory and practice, and research attempts to measure ethical investment using this theoretical conceptualisation is justified.

There are also many stakeholders who are taken into consideration while taking decisions. This seems to indicate that in this sample respondents are mainly concerned about their stakeholders. There was strong emphasis on activities/ investments for the benefits of the stakeholders.

Finally, the majority of the Organisational directors in the study indicated that cultural/ environmental factors do affect the decision making process. This indicates that as in other organisation (for-profit entities) environmental factors do affect decision making process. In view of the need for an ethical decision making model in Indian religious organisations, these findings warrants further research into this area.

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GREEN MARKETING MIX: A STRATEGY FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

The purpose of this research study is to evaluate green marketing mix as a strategy to ensure Sustainable development for the business organizations. For this purpose, the four P's of marketing mix are Evaluated in such a way to find out the ways by which these P's enables the organizations retaining their Customers and achieve sustainable development. It also assessed the significance of need for green marketing and the factors influencing the green marketing mix. The analysis will reveal and conclude that green marketing mix has significant effect on consumer satisfaction. It can be assumed that companies can create competitive advantage in their organization through taking steps in making the green marketing part of their overall marketing strategy.

KEYWORDS
Green marketing, sustainable development, competitive advantage.

INTRODUCTION

The present environment is surrounded by different issues which influence all human activities. As society becomes more concerned with the natural environment, one of the environmental issues, pollution is a buzz word in today's business environment. Businesses have begun to modify their behavior in an attempt to address society's problem. One of such behavior is handling consumers through its varied strategies. Consumers are also aware of the environmental issues like global warming and the impact of environmental pollution. In order to tackle the important issue of environmental pollution, an important concept of green marketing has been emerged in India and other parts of the developing and developed world and facilitating sustainable development.

MEANING

Green marketing refers to the process of selling products and/or services based on their environmental benefits. Such a product or service may be environmentally friendly in it or produced and/or packaged in an environmentally friendly way. The obvious assumption of green marketing is that potential consumers will view a product or service's "greenness" as a benefit and base their buying decision accordingly.

GREEN MARKETING- DEFINITION

According to the American Marketing Association, —Green Marketing is defined as the development and marketing of products designed to minimize negative effects on the physical environment or to enhance its quality. However, applying a concrete definition to such a slippery concept, which has taken many forms and shapes over the years, has proven to be anything but simple or manageable. And, as you have seen on our Source and Resource site thus far, green marketing can include a variety of activities in diverse areas. Green marketing refers to the process of selling products and/or services based on their environmental benefits. Such a product or service may be environmentally friendly in it or produced and/or packaged in an environmentally friendly way. As per Mr. J. Polonsky, green marketing can be defined as, "All activities designed to generate and facilitate any exchange intended to satisfy human needs or wants such that satisfying of these needs and wants occur with minimal detrimental input on the national environment." Green marketing involves developing and promoting products and services that satisfy customers want and need for Quality, Performance, Affordable Pricing and Convenience without having a detrimental input on the environment.

EVOLUTION OF GREEN MARKETING

There is growing interest among the consumers all over the world regarding protection of environment. Worldwide evidence indicates people are concerned about the environment and are changing their behavior. As a result of this, green marketing has emerged which speaks for growing market for sustainable and socially responsible products and services. The green marketing has evolved over a period of time.
According to Peatti (2001), the evolution of green marketing has three phases- First phase was termed as "Ecological" green marketing, and during this period all marketing activities were concerned to help environment problems and provide remedies for environmental problems. Second phase was "Environmental" green marketing and the focus shifted on clean technology that involved designing of innovative new products, which take care of pollution and waste issues. Third phase was "Sustainable" green marketing. It came into prominence in the late 1990s and early 2000.

PROCESS OF GREEN MARKETING

The process of green marketing involves producing quality products which are not harmful and supplying to the consumers. It also uses the resources in such a way to ensure its availability to the future generations to avail the resources to meet their needs leading to Sustainable Development. For the purpose policies are framed and implemented in such a way to protect the environment and ensure sustainable development. It also makes marketers and consumers sensitive to the need for switch in to green products and services.

NEED FOR GREEN MARKETING

Many companies understood their responsibility to be environmental friendly in order to achieve their objective of profitability through achieving environmental objectives. They have started using green marketing as a tool to tackle the issue. Under the concept of green marketing, the companies produce commodities to meet the health issues, neighborhood amenity and climate change. Moreover, government framed legalizations and initiatives requiring the companies to adopt green marketing. The nature of innovative technologies and approaches of dealing with pollution, improved resource and energy efficiency and need to retain existing customers, the companies are urged to adopt green marketing.

MARKETING MIX STRATEGY

The marketers make and use various policies to get success in the field of marketing. Out of such policies marketing mix is one of the important policies. This marketing mix involves various activities like identifying the market behaviour, determine the consumer needs, and plan to face the competition effectively. The group of these activities is known as marketing mix. It involves four elements viz., product, price, physical distribution and promotion popularly known as P's to ensure placing of the product in the hands of the consumers successfully. The marketing mix, as it is a plan, will have to be changed according to the changes in the marketing conditions. Green marketing is changing condition of market to meet the present needs of the market expectations. Hence, the marketing has to

be changed according to the expected changes. Accordingly, the four 'P's followed in conventional marketing are changed in view of the changed scenario and adopted in the present day market environment as described below:

Product

Marketers who want to use green market strategy must produce products according to the expectations of the customers. In the present day need of protecting the environment and conserving the scarce resources to attain the sustainability is the most concern of the customers. Also it should enhance the competitiveness of the company. Such products include Products made from recycled goods, Products that can be recycled or reused, Efficient products, which save water, energy or gasoline, save money and reduce Environmental impact, Products with environmentally responsible packaging, Products with green labels, as long as they offer substantiation and Organic which offer quality.

Price

Pricing is a critical element of the green marketing mix and it should be based on the additional product value it offers. This value may be improved performance, function, design, visual appeal or taste. These values are the added benefits and often will be the deciding factor between products of equal value and quality.

Place

The place where the product is available and the time of its availability are the most crucial factors in the purchase behaviour of the customers. Most of the customer is not ready going to faraway places or unknown places where the products are available. Their expectation is easy accessibility to the market place. Marketers who want to succeed in green marketing strategy should position them in the market place apart from making an appeal to them. The location also speaks the image of the company that it wants to project and differentiate it from the competitors.

Promotion

It is promotion which informs the customer about the availability of the green product. Users of green marketing strategy adopt variety of techniques in promoting their products. Such techniques include paid advertising, public relations, sales promotions, direct marketing and on-site promotions. For example, many companies in the financial industry are providing electronic statements by email, e-marketing is rapidly replacing more traditional marketing methods, and printed materials can be produced using recycled materials and efficient processes, such as waterless printing.

CONCLUSION

Green marketing is based on the assumption that businesses have a responsibility to satisfy human needs and desires while preserving the integrity of the natural environment. Indeed, there are significant indications that environmental issues will grow in importance over the coming years and will require imaginative and innovative redesign and reengineering of existing marketing efforts on the part of many businesses. Green marketing mix strategy and the promotion of responsible consumption are related with business category. A clever marketer is one who not only convinces the consumer, but also involves the consumer in marketing his product. Green marketing mix should be considered as an approach to marketing and it has to be pursued with much greater vigor, as it has an environmental and social dimension to it. The marketer must find an opportunity to enhance their product's performance and strengthen the customer's loyalty and command a higher price and thereby fulfilling his profitability and environmental objectives.

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CONSIDERING RELATIONSHIP BETWEEN CASH WITH CAPITAL COST AND FINANCIAL FLEXIBILITY

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ABSTRACT

Cash is one of the most important and crucial sources in any profit organization and forming balance between cash in hand and cash requires has been considered as a main factor of economics' health in each profit organization. The study has considered relationship between cash with capital cost and financial flexibility; as both companies which do not maintain cash adequately and companies which maintain considerable cash have suffered many problems. The goal of the research is to study extreme value of cash for investors and to consider connection between financial flexibility and capital cost as well as effect of financial flexibility and capital cost on decisions about holding amount of cash. The present study was conducted from 2006 to 2011 in Tehran stock exchange with a total of 654 observations that were applied for period of the research. The study is an applied research as its purpose and research method is correlated from nature and content point of view. Multiple regressions have been used as statistical method in this research. Results have shown that there is a direct relationship between capital cost and financial flexibility with cash.

KEYWORDS
Cash, financial flexibility, capital cost.

1. INTRODUCTION

With economic aspects of information, financial reporting and accounting system have played crucial role in capital market. Main purpose of financial reporting is to supply investors with information needs. By using accounting information, investors and users can forecast company's future performance and then apply it for the company's valuation. Easley and O'Hara (2003) believe that a company can affect information asymmetry through using value, accuracy and quality of information which has been offered to investors.

Quality of accrual items would be a criterion to determine existed uncertainty on future cash flow and investors believe that the quality of accrual items means closeness of accounting profit to cash (Francis and et al 2005).

Cash related to capital and profit has played important role because it indicates purchasing power which can transform it to other persons or organizations to use for providing their required goods and services.

Capital cost and financial flexibility has been considered from intra and extra -organizational aspects. From extra-organizational viewpoint, capital cost and financial flexibility is applied for securities assessment and performance valuation of a company. From intra-organizational aspect, capital cost and financial flexibility has played a key and basic role in making decisions on investment and priorities of investment, optimum structure of capital and performance assessment of different parts.

One of the most important issues in financial literature is decision making and selecting optimum strategies on investing funds and capital structure to increase overall value of the economic unit. At this regard, issue of general financing, capital cost and financial flexibility have been focused particularly.

Financial flexibility depends on ability of companies to create benefit from unplanned opportunities with regard to financial policies and structures of the companies (Puccia and Jones 2009).

Today, cash flows have central role in many financial decisions, securities assessment models, methods of investment plans appraisal and some tradition and modern analyses of financial management (Power of financial statements' items in forecast cash flows). With regard to increasing growth of investment in cash among companies, unjustified opportunities cost would be created, which the opportunity cost has derived from low efficiency of investment in cash. Also with studies and consideration of related researches, financial flexibility can be one of the main indicators to help identify above mentioned issue.

As performance assessment of companies is valuable for managers, actual and potential investors, financial analysts and other users of financial information in Iran, it is required to examine modern criteria of performance assessment in researches to help make logical decisions.

In the study, we have considered proposed modern criteria on relationship between cash with capital cost and financial flexibility as well as traditional standards of accounting such as applied capital, market value to book value of assets, ratio of operational cash flow to total assets and company size, as performance indicators and then examined the relationship.

Main goal of the study is to consider relationship between cash with capital cost and financial flexibility in accepted companies at Tehran stock exchange. Despite of all failures existed in structure of Tehran stock exchange as well as lack of households' acquaintance with financial investments, stock exchange is one of the most attractive investments and its studies can contribute to allocate sources in the country economy through optimum way. Investors in stock exchange are obtained different interests like dividend per share and increase in share prices. They use financial information for assessing and analyzing stocks. Cash, capital cost and financial flexibility are basic variables which have been reviewed by both investors and managers in capital market and therefore, relationship between these variables is significant for allocating optimum sources in economy.

In this study we seek to answer, is there any significance relationship between cash balance with capital cost and financial flexibility? Can cash balance be an effective factor of capital cost and financial flexibility?

2. LITERATURE AND HISTORY OF RESEARCH

With establishing large companies and increasing number of stockholders, it becomes impossible for stockholders to control units directly; and selected managers have gained considerable freedom to employ economical sources of units. Gradually providing information for stockholders has been replaced with financial reporting of information preparation for creditors, as rate of people, who use financial statements, has changed, goal of information preparation has been changed. The goal of providing financial statements is assessing managers' duties at this time.

Profit measurement (as a tool of assessing manager performance) has been questioned which was previously done through financial statement; because the way that is applied for obtaining profit would be important for assessing managers duties. From that time operating statement has implanted in financial statements, during several years balance sheets and profit and loss as well as attachments and related tables were formed financial statements.

Accounting Principles Board in the United States issued declaration number 3 in 1963 to provide standards for preparing and delivering the financial statement; it offered to change name of the financial statement into "statement of source and application of funds" and then presented as supplementary information along with annual reports. Since funds at the declaration was described with all financial sources, therefore the financial statement includes financial aspects of any major deals, apart from their direct impact on funds; purchasing fixed asset in return for issuing bond can be an good example. It is true that no money has been exchanged in the event, but such an event must be reflected at the statement of source and application of funds. Positive reactions of accounting profession on the matter has led Accounting Principles Board to issue declaration number 19 in 1971 with title of "change reporting in financial statement". Such failures cause creditors and investors conclude that accrual accounting has kept distance from enterprises' cash flow. Capital cost is a concept which always has been considering by financial experts and also is a main factor to create a gap between accounting profit and economic profit; the concept has been defined differently. One of the more acceptable definitions is describing capital cost as minimum rate of return in which if it was acquired, value of economics unit would be fixed. In a conceptual manner, cost expense of a company is an investor opportunity cost for investing at that company. Cost expense has two important aspects; first aspect is that all securities assessment patterns depend on cost expense. Second aspect explains that investing funds through company and determining investment priorities as well as recognizing capital structure without capital cost would not be practical (Salimi Ahmad 2007). Byoun in 2009 defined financial flexibility as a degree of capacity and speed which a company can provide its required sources for defensive reactions (discharge of debts) and aggressive reactions (investment) in order to increase the company value. Puccia and Jones in 2009 described financial flexibility as ability of companies to create benefit from unplanned opportunities with regard to financial policies and structures of the companies. Flexibility is a key mechanism to control dynamic of investments which financial decisions and related uncertainty would be appeared due to lack of flexibility. Financial flexibility can be defined as companies' ability to allocate again cash flow between bond and stockholders for better adjustment of operational risk and value creation in long term (Donaldson 1969, 121).

Kim, Mauer and Sherman (1998) and Williamson (1999) have shown that investment in circulating assets (or flexible) will be too costly, as the company could invest in fixed assets generating investment instead of investing in circulating assets.

Gouni and et al (2002) in a research with title "considering companies' cash on hand behavior" were observed behavior of cash on hand in Japan, France, Germany and England during 1983 to 2000. They used ARCH and GARCH methods to consider companies' cash on hand behavior and then compared some countries. Results have indicated that legal structure of a country and ownership structure are played significant role to determine the company cash on hand. They found that greater protection of stockholders is related with lower cash and ownership focus has negative impact on cash level.

Pinkowitz and et al (2004) tested impact of stockholders' equity throughout a country on holding cash and then indicated that cash has less value for minority stockholders in countries with lower stockholder protection. The result is coordinated with the assumption that weak protection stockholders' equity will allow managers and controlling interest stockholders to employ the company's sources for their interests.

Kalcheva and Lins (2007) reviewed that how protecting stockholders' equity can affect cash holding. They found countries with weaker laws for stockholders tend to hold more cash. In addition, they conclude that cash assets have negative relationship with company value.

Marchica and Mura (2007) investigated relationship between financial flexibility and investment decisions and concluded that there is a strong relationship between financial flexibility and investment. On the other hand, after a period of low lever, companies with financial flexibility have more ability to perform capital costs (Marchica and Mura 2007).

Harford and et al (2008) reached the conclusions that American companies with weaker corporate governance structure; have spent reserves of cash surplus in mergers which destroy value. Moreover, American companies with lower protection of stockholders' equity and high level of cash holding, have lower flexibility and value. Other studies offer evidences using international information, they explain that there is negative relationship between company cash holding and protecting stockholders' equity; and when companies with weak corporate governance structure hold high level of cash, its value would be decreased, especially while stockholder protection is low throughout country.

Robets and Groinger (2010) studied factors which affect companies' cash balance with title "considering effective factors on companies' cash balance"; they used multiple regression for considering and testing their hypotheses. Results have shown that both tangible assets and company size has negative relationship with cash balance and also there is a nonlinear relation between financial lever and liquidity holding. Paying dividend and operational cash flows have positive relationship with cash reserves but there is no significant relation between opportunities growth and cash balance.

Yuanto (2011) tested relationship between corporate governance mechanisms for cash balance and impact on firm value in Singapore. Some results indicate that corporate governance in firms with lower efficiency tends to cash holding. Other results have shown that managers reserve cash for precaution due to flexibility and conflict between manager and owners and representation theory. In addition to companies with pyramidal ownership structure, there are one man companies which hold lower cash on hand and have higher market value.

Subramanian and et al (2011) had done similar research on reviewing relationship between firm structure and level of cash holding. They collected some evidences from the environment of New York stock exchange during 1988 to 2006 and then indicated companies with decentralized and diversified ownership have held significantly cash lower than companies with centralized ownership. Their considerations have explained that companies with diversified ownership would hold less cash on hand because they communicate with other companies and industries and have more investment opportunities and growth.

3. RESEARCH HYPOTHESES

In this study, the researcher is sought to find answers for the following questions:

- Is there any significant relationship between capital cost and cash?
- Is there any significant relationship between financial flexibility and cash?

Following hypotheses are explained with respect to the goals of the research and the literature:

- First hypothesis- there is significant relationship between capital cost and cash.
- Second hypothesis- there is significant relationship between financial flexibility and cash.

4. RESEARCH METHOD

Since purpose of the study, it is an applied research. Research methods have correlated nature and content. The study has been conducted in framework of inductive-deductive reasoning. Therefore, theoretical basics and history of research were done through library studies, articles and sites were in deductive framework and data collection had been conducted inductively to accept or reject hypotheses.

4.1. RESEARCH VARIABLES

Independent variable of the research is cash and dependent variables of the research include capital cost and financial flexibility.

Methods of computing research variables:

CAPEX = capital cost

Capital cost: costs of stockholders' equity have been computed through division net profit to market value of stockholders' equity or profit ratio of each stock divided by price of each stock.

Cost of stockholders' equity is equaled to ratio of net profit to stockholders' equity. Numerator and denominator have been divided by number of stocks which finally would be ratio of $\frac{E}{P}$.

$$CAPEX = \frac{NI}{MVE} / \frac{Stock}{Stock} = \frac{EPS}{PRICE}$$

NI= Net profit of firm
MVE= Market value of stockholders' equity
Stock= number of firm shares at end of financial course
EPS= earnings per share
PRICE= share price of firm in market
INDSTDCF= industry average cash that the firm has activity on it
Q= market value to book value of assets
LNAT= log total asset
CFe= ratio of operational cash flow to total assets
NWC= applied capital
BKDEBT= book value of debts to total assets
RD_SALE = net sales of firm (i) multiply in time (t)
DIVDUM= cash dividend approved by assembly
ACQUI = total assets productivity (it equals to operational profit divided by total assets)
Second hypothesis can be tested through the following regression model:

$$Cash_{i,t} = c + \alpha_1 DC_{i,t} + \alpha_2 INDSTDCF_{i,t} + \alpha_3 Q_{i,t} + \alpha_4 LNAT_{i,t} + \alpha_5 CFe_{i,t} + \alpha_6 NWC_{i,t} + \alpha_7 FL_{i,t} + \alpha_8 BKDEBT_{i,t} + \alpha_9 RD\_SALE_{i,t} + \alpha_{10} DIVDUM_{i,t} + \alpha_{11} ACQUI_{i,t} + \varepsilon_i$$

DC= book value of debts to assets return
Fl= financial flexibility
Financial flexibility: in order to identify companies with financial flexibility, companies which had lower financial lever in three consecutive years than median population are classified as companies with financial flexibility (Marchica and Mura 2007).
Financial lever is amount of debts that has been used for financing assets of a firm.

$$Financial\ LEVER = \frac{Total\ Debt}{Total\ Asset}$$

Total debt= book value of total debts
Total asset= book value of total assets

4.2. METHOD OF DATA COLLECTION

Field method has been employed for collecting information on accepting or rejecting research questions; and library method applied to gather information about research literature.
Statistical population includes all companies accepted in Tehran stock exchange which were active in stock exchange from beginning 2006 to 2011. Elimination method has used for selecting statistical sample and following criteria is considered for this purpose. If a company achieved all criteria, it would be selected as research sample.

- ✓ The company must be accepted in Tehran stock exchange before 2006 and has been operating there until end of 2011.
- ✓ The company has not changed its financial year during 2006 to 2011 and its financial year ended in March (19 March).
- ✓ The company has been continuously active and has at least 80 trading days in year.
- ✓ The company has not involved in group of investment companies or financial intermediaries.

After considering above items, 109 companies were remained which selected as research sample. Therefore, our observations reach to 654 year-company.

4.3. ANALYSIS RESEARCH HYPOTHESES

At this step, as dependent and independent variables have been determined and computed, the research hypotheses would be tested and analyzed. First we test existence of correlation between dependent and independent variables and then regression method has been applied to determine relationship between dependent and independent variables. In fact analyzing regression help us to find linear relation between variables, if exist. At the end, correlation index has been employed to determine level of relationship between dependent variable and independent variables in the research.

5. RESULTS

5.1. CONSIDERING NORMALITY OF VARIABLES

As normality of dependent variable lead to normality of rest of model, it is necessary to control the normality before fitting the model.
Null hypothesis and alternative hypothesis for test of normality are as follows:
H_0: data distribution is normal
H_1: data distribution is not normal
Kolmogorov-Smirnov test has been employed to test above hypotheses. In this test, when significance level is lower than 5%, null hypothesis will be rejected with 95% certainty (table 1).

TABLE 1: KOLMOGOROV-SMIRNOV TEST

Abbreviation	Cash
Number of data	656
Mean	90860.0595
Standard deviation	3.30032E5
Absolute maximum deviations	.392
Maximum positive deviations	.358
Maximum negative deviations	-.392
Value of statistic z	10.028
Significance level	.000

It is shown in table 1, because significance level of dependent variable is smaller than 0.05, H_0 has been rejected and H_1 has been accepted; it means that data does not follow normal distribution. Mathematical conversion (second power logarithm) has used to normalize variables. The following test considers normality of converted variables.

TABLE 2: KOLMOGOROV-SMIRNOV TEST

Abbreviation	LNCASH
Number of data	655
Mean	19.4997
Standard deviation	3.35851
Absolute maximum deviations	.054
Maximum positive deviations	.054
Maximum negative deviations	-.038
Value of statistic z	1.372
Significance level	.056

It is shown in table 2, because significance level of dependent variable is larger than 0.05, H_0 has been accepted and H_1 has been rejected. On the other hand data has normal distribution. Therefore hypothesis on normalize variable is accepted.

5.2. TEST OF HYPOTHESES

TEST OF FIRST HYPOTHESIS

H_0: there is not significant relationship between capital cost and cash.

H_1: there is significant relationship between capital cost and cash.

$$\begin{cases} H_0 : \rho = 0 \\ H_1 : \rho \neq 0 \end{cases}$$

TABLE 3: CORRELATION COEFFICIENT, COEFFICIENT OF DETERMINATION, DURBIN-WATSON TEST BETWEEN CASH AND CAPITAL COST

Model	correlation coefficient	determination coefficient	Adjusted coefficient of determination	Standard error of estimate	Durbin-Watson statistic
1	.842[a]	.708	.704	1.81277	1.724

According to table3, Pearson correlation coefficient between cash and capital cost is 0.842. The figure shows a significance relationship between two variables with 5% error level. As outcomes of SPSS software, tables are indicated that because significance level is lower than 5%, H_0 has been rejected with 5% error level and existence of correlation between two variables has been confirmed. Also adjusted coefficient of determination equals to 0.704 which is a proper number and has presented an appropriate fitting from changes of capital cost with using cash. One of the regression hypotheses is independence of errors; if the independence of errors hypothesis has been rejected and errors were correlated with each other, using the regression is impossible. Durbin-Watson statistic apply to review independence of errors, if value of Durbin-Watson statistic has placed in distance of 1.5 to 2.5, the hypothesis which explains there is a correlation between errors will be rejected and it is possible to use the regression. According to table (3-4), the value of Durbin-Watson statistic is 1.724 and the figure has shown that errors are separated from each other and there is no self-correlation between errors, then the hypothesis which explains there is a correlation between errors will be rejected and we can use the regression.

TABLE 4: REGRESSION ANALYSIS OF VARIANCE FOR CASH AND CAPITAL COST

Model		Sum of squares	Degree of freedom	Mean squares	F statistic	Significance level
1	Regression	5016.557	10	501.656	152.658	.000[a]
	Remaining	2066.987	629	3.286		
	Total	7083.544	639			

Table 4 shows analysis of variance between capital cost as independent variable and cash as dependent variable, as per the outcome, general significance of the regression model has been tested through ANOVA table and the following statistical hypotheses.

H_0: there is not linear relation between two variables.

H_1: there is linear relation between two variables.

As significance level is smaller than 5%, H_1 has been accepted. Now we look for the relationship:

TABLE 5: COEFFICIENTS OF REGRESSION EQUATION FOR INDEPENDENCE AND CONTROL VARIABLES

Model	Abbreviation	Unstandardized Coefficients		Standardized coefficients	Statistic t	Significance level	Collinearity Statistics	
		B	Standard error of Coefficient Column B				Tolerance	Variance inflation factor
1	(Constant)	-5.159	0.976		-5.287	0		
	INDSTDCF	7.37E-06	0.0001	0.676	10.641	0	0.115	2.701
	Q	-0.22	0.172	-0.042	-1.28	0.201	0.424	2.356
	LNAT	4.332	0.158	0.785	27.424	0	0.566	1.767
	CFe	0.317	0.247	0.029	1.283	0.2	0.916	1.091
	NWC	-1.41E-06	0.0001	-0.503	-7.404	0	0.101	2.939
	CAPEX	4.322	0.158	0.785	27.424	0	0.313	3.199
	BKDEBT	-1.226	0.517	-0.07	-2.371	0.018	0.54	1.853
	RD.SALE	-5.45E-08	0.0001	-0.132	-2.954	0.003	0.234	4.278
	DIVDUM	0.0001	0.0001	-0.084	-2.494	0.013	0.406	2.462
	ACQUI	3.604	1.068	0.133	3.373	0.001	0.298	3.361

Constant value and coefficient of independence variable in the regression equation are provided respectively in outcome of table 5 and in column B. The equation is as follows:

$$Cash_{i,t} = -5.159 + 7.37E-06 * INDSTDCF_{i,t} - 0.22 * Q_{i,t} + 4.332 * LNAT_{i,t} + 0.317 * CFe_{i,t} - 1.41E-06 * NWC_{i,t} + 4.322 * CAPEX_{i,t} - 1.226 * BKDEBT_{i,t} - 5.45E-08 * RD\_SALE_{i,t} + 0.0001 * DIVDUM_{i,t} + 3.604 * ACQUI_{i,t} + \varepsilon_i$$

According outcomes of table 5, rest of its columns include standard coefficients column B, statistic t and significance level have been applied to test hypothesis that explains any of coefficients column B are equaled to zero. If β and α have been respectively constant value and slope of line in regression of population, test of hypotheses for two values can be written as follows:

$$\begin{cases} H_0 : \beta = 0 \\ H_1 : \beta \neq 0 \end{cases} \qquad \begin{cases} H_0 : \alpha = 0 \\ H_1 : \alpha \neq 0 \end{cases}$$

As significance level equals zero at this outcome, equality test of regression coefficient and constant value equal to zero or lower than 5%. Therefore hypothesis which explains these coefficients are equal to zero has been rejected and they must not be eliminated from the equation regression.

TEST OF SECOND HYPOTHESIS

H_0: there is not significant relationship between financial flexibility and cash.

H_1: there is significant relationship between financial flexibility and cash.

$$\begin{cases} H_0 : \rho = 0 \\ H_1 : \rho \neq 0 \end{cases}$$

TABLE 6: CORRELATION COEFFICIENT, COEFFICIENT OF DETERMINATION, DURBIN-WATSON TEST BETWEEN CASH AND FINANCIAL FLEXIBILITY

Model	correlation coefficient	determination coefficient	Adjusted coefficient of determination	Standard error of estimate	Durbin-Watson statistic
1	.732[a]	.608	.603	1.81151	1.825

According to table 6, Pearson correlation coefficient between cash and financial flexibility is 0.732. The figure shows a significance relationship between two variables with 5% error level. As outcomes of SPSS software, tables are indicated that because significance level is lower than 5%, H_0 has been rejected with 5% error level and existence of correlation between two variables has been confirmed. Also adjusted coefficient of determination equals to 0.603 which is a proper number and has presented an appropriate fitting from changes of financial flexibility with using cash. One of the regression hypotheses is independence of errors; if the independence of errors hypothesis has been rejected and errors were correlated with each other, using the regression is impossible. Durbin-Watson statistic apply to review independence of errors, if value of Durbin-Watson statistic has placed in distance of 1.5 to 2.5, the hypothesis which explains there is a correlation between errors will be rejected and it is possible to use the regression. According to table (6), the value of Durbin-Watson statistic is 1.825 and the figure has shown that errors are separated from each other and there is no self-correlation between errors, then the hypothesis which explains there is a correlation between errors will be rejected and we can use the regression.

TABLE 7: REGRESSION ANALYSIS OF VARIANCE FOR CASH AND CAPITAL COST

Model		Sum of squares	Degree of freedom	Mean squares	F statistic	Significance level
1	Regression	5016.164	9	557.352	169.844	.000[a]
	Remaining	2067.380	630	3.282		
	Total	7083.544	639			

Table 7 shows analysis of variance between financial flexibility as independent variable and cash as dependent variable, as per the outcome, general significance of the regression model has been tested through ANOVA table and the following statistical hypotheses.

H_0: there is not linear relation between two variables.

H_1: there is linear relation between two variables.

As significance level is smaller than 5%, H_1 has been accepted. Now we look for the relationship:

TABLE 8: COEFFICIENTS OF REGRESSION EQUATION FOR INDEPENDENCE AND CONTROL VARIABLES

Model	Abbreviation	Unstandardized Coefficients		Standardized coefficients	Statistic t	Significance level	Collinearity Statistics	
		B	Standard error of Coefficient Column B				Tolerance	Variance inflation factor
1	(Constant)	-5.092	0.969		-5.257	0		
	DC	1.87E-10	0.0001	0.024	1.101	0.271	0.965	1.036
	INDSTDCF	7.37E-06	0.0001	0.676	10.661	0	0.115	2.685
	Q	-0.233	0.169	-0.045	-1.373	0.17	0.435	2.297
	LNAT	4.31	0.156	0.783	27.557	0	0.574	1.744
	CFe	0.311	0.246	0.028	1.263	0.207	0.917	1.091
	NWC	-1.38E-06	0.0001	-0.492	-8.257	0	0.131	2.653
	BKDEBT	-1.234	0.516	-0.07	-2.392	0.017	0.541	1.849
	FL	5.23	0.211	0.683	24.786	0	0.625	1.719
	RD.SALE	-5.61E-08	0.0001	-0.135	-3.043	0.002	0.234	4.281
	DIVDUM	0.0001	0.0001	-0.084	-2.493	0.013	0.406	2.462

Constant value and coefficient of independence variable in the regression equation are provided respectively in outcome of table 8 and in column B. The equation is as follows:

$$Cash_{i,t} = -5.092 + 1.87E-10 * DC + 7.37E-06 * INDSTDCF_{i,t} - 0.233 * Q_{i,t} + 4.31 * LNAT_{i,t} + 0.311 * CFe_{i,t} - 1.38\text{E}-06 * NWC_{i,t} + 5.23 * FL_{i,t} - 1.234 * BKDEBT_{i,t} - 5.61E-08 * RD\_SALE_{i,t} + 0.0001 * DIVDUM_{i,t} + 3.687 ** ACQUI_{i,t} + \varepsilon_i$$

According outcomes of table 8, rest of its columns include standard coefficients column B, statistic t and significance level have been applied to test hypothesis that explains any of coefficients column B are equaled to zero. If β and α have been respectively constant value and slope of line in regression of population, test of hypotheses for two values can be written as follows:

$$\begin{cases} H_0 : \beta = 0 \\ H_1 : \beta \neq 0 \end{cases} \quad , \quad \begin{cases} H_0 : \alpha = 0 \\ H_1 : \alpha \neq 0 \end{cases}$$

As significance level equals zero at this outcome, equality test of regression coefficient and constant value equal to zero or lower than 5%. Therefore hypothesis which explains these coefficients are equal to zero has been rejected and they must not be eliminated from the equation regression.

6. DISCUSSION AND CONCLUSION

The goal of the research is to study extreme value of cash for investors and to consider connection between financial flexibility and capital cost as well as effect of financial flexibility and capital cost on decisions about holding amount of cash.

The present study was conducted from 2006 to 2011 in Tehran stock exchange with 654 observations in total. Since purpose of the study, it is an applied research that its method has correlated nature and content. Multiple regressions have been used as statistical method in this research.

With test of first hypothesis, we conclude that there is positive correlation between independent variable (capital cost) and dependent variable (cash) in accepted companies at Iran capital market which its value equals 0.842. In figure (4-4), statistic F is 152.658 and value of sig= 0 which means the multiple regressions is significant with 95% certainty. Therefore H_0 has rejected and there is significant relationship between capital cost and cash in accepted companies at Iran capital market.

Statistic t which was obtained from variable of capital cost means that coefficient of the variable is significant in level of α=5% with control variables. Value of statistic t equals to 27.424 which indicate there is direct relationship between capital cost and cash. With respect to obtained results there is direct relationship between capital cost and cash in accepted companies at Tehran stock exchange; it means that increase in capital cost would lead to increase in cash and vice versa.

With test of second hypothesis, we conclude that there is positive correlation between independent variable (financial flexibility) and dependent variable (cash) in accepted companies at Iran capital market which its value equals 0.732. In figure (4-7), statistic F is 169.844 and value of sig= 0 which means the multiple regressions is significant with 95% certainty. Therefore H_0 has rejected and there is significant relationship between financial flexibility and cash in accepted companies at Tehran stock exchange.

Statistic t which was obtained from variable of financial flexibility means that coefficient of the variable is significant in level of α=5% with control variables. Value of statistic t equals to 24.786 which indicate there is direct relationship between financial flexibility and cash. With respect to obtained results there is direct relationship between capital cost and cash in accepted companies at Tehran stock exchange; it means that increase in financial flexibility would lead to increase in cash and vice versa.

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UNDERSTANDING THE GREEKS AND THEIR USE TO MEASURE RISK

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ABSTRACT

Trading options without an understanding of the Greeks - the essential risk measures and profit/loss guideposts in options strategies - is synonymous to flying a plane without the ability to read instruments. Unfortunately, many traders are not option strategy "instrument rated"; that is, they do not know how to read the Greeks when trading. This puts them at risk of a fatal error, much like a pilot would experience flying in bad weather without the benefit of a panel of instruments at his or her disposal. This tutorial is aimed at getting an instrument rated in options trading, to continue the analogy with piloting, so that we can handle any strategy scenario and take the appropriate action to avoid losses or enhance gains. When any strategy is constructed, there are associated Delta, Vega and Theta positions, as well as other position Greeks. When options are traded outright, or are combined, we can calculate position Greeks (or net Greeks value) so that we can know how much risk and potential reward resides in the strategy, whether it is a long put or call, or a complex strategy like a strangle, butterfly spread or ratio spread, among many others. Typically, you should try to match your outlook on a market to the position Greeks in a strategy so that if your outlook is correct you capitalize on favourable changes in the strategy at every level of the Greeks. That is why knowing what the Greeks are telling you is so important. Greeks can be incorporated into strategy design at a precise level using mathematical modelling and sophisticated software. But at a more basic level, the Greeks can be used as guideposts for where the risks and rewards can generally be found.

KEYWORDS
Derivatives ,Greeks, Options.

INTRODUCTION

In mathematical finance, the **Greeks** are the quantities representing the sensitivities of the price of derivatives such as options to a change in underlying parameters on which the value of an instrument or portfolio of financial instruments is dependent. The name is used because the most common of these sensitivities are often denoted by Greek letters. Collectively these have also been called the **risk sensitivities**, **risk measures** or **hedge parameters**.
The —Greeks" are five partial derivatives of price with respect to the parameters or factors which determine the value of an option. They can be used as indicators to help monitor and analyse the risks associated with portfolios which include options.
The five Greeks and the associated derivatives that this project focuses on are:

- **Delta** (price of underlying)
- **Gamma** (2nd derivative of price)
- **Vega** (volatility)
- **Theta** (time)
- **Rho** (risk free interest rate)

When any strategy is constructed, there are associated *Delta*, *Vega* and *Theta* positions, as well as other position Greeks. When options are traded outright, or are combined, we can calculate position Greeks (or net Greeks value) so that we can know how much risk and potential reward resides in the strategy, whether it is a long put or call, or a complex strategy like a strangle, butterfly spread or ratio spread, among many others. Typically, you should try to match your outlook on a market to the position Greeks in a strategy so that if your outlook is correct you capitalize on favourable changes in the strategy at every level of the Greeks. That is why knowing what the Greeks are telling you is so important. Greeks can be incorporated into strategy design at a precise level using mathematical modelling and sophisticated software. But at a more basic level, the Greeks can be used as guideposts for where the risks and rewards can generally be found.

REVIEW OF LITERATURE

This section reviews the literature on determining the use of Greeks in the derivatives market. Many textbooks (e.g. **Hull 2011, chapter 17)** contain short descriptions of the primary Greeks, i.e. Delta, Gamma, Vega, Theta, Rho, etc. **Pelsser and Vorst (1994)** discussed the determination of these Greeks in the context of the binomial model (**Cox and Rubinstein 1983**). **Garman (1992)** christens three more partial derivatives with the names speed, charm, and color. The duration of option portfolios is defined in **Garman (1985),** while *volatility immunization* and *Gamma duration* are defined in **Garman (1999)**.
Similarly, **Haug (1993)** discusses the aggregation of Vegas of options of different maturities. **Hull and White (1987)** compare Delta hedging, Delta+Gamma hedging, and Delta+Vega hedging of written FX options and conclude that the last of these works best. **Willard (1987)** calculates sensitivities for path-independent derivative securities in multifactor models, while **Ross (1998)** calculates sensitivities for multi-asset European options.
Estrella (1995) derives an algorithm for determining arbitrary price derivatives of the BMS option formula. He then examines Taylor series expansions in the stock price and finds the radius of convergence. **Broadie and Glasserman (1996), Curran (1993), and Glasserman and Zhao (1999)** all consider the estimation of security price derivatives using simulation. **Bergman (1983) and Bergman, Grundy, and Wiener (1996)** derive expressions for Delta and Gamma when volatility is a function of stock price and time. **Grundy and Wiener (1996)** also derive the theoretical and empirical bounds on Deltas for this case. **Fournie (1997) and Bermin (1999)** use Malliavin calculus to determine Deltas in even more general settings. There is a substantial literature on durations of bonds, which this literature survey ignores in the interests of brevity. However, **Bergman (1998) and Hull and White (1992)** examine Greeks of interest rate derivatives in diffusive single-factor models. Similarly, using an option pricing context, Ferri, **Oberhelman, and Goldstein (1982)** examine yield sensitivities of short term securities, while **Ogden (1987)** examines yield sensitivities of corporate bonds.
In a very general context, **Breeden and Litzenberger (1978)** show that the second derivative with respect to an option's strike price can be used to imply out state-contingent prices. Similarly, **Schroder (1995)** shows that the first derivative with respect to the strike of an American option yields the risk-neutral probability of exercise. He also interprets the Deltas of American options.
The following are some major works in this field:
• **Binomial model Greeks - Pelsser and Vorst (1994).**
• **Vega hedging.**
– Garman (1999)
– Haug (1993)
– Hull and White (1987)
• **Multi-factor Greeks.**
– Willard (1997)
– Ross (1998)

- **Taylor series in stock price - Estrella (1995).**
- **Price Greeks for Monte Carlo simulation.**

– Broadie and Glasserman (1995)
– Curran (1993)
– Glasserman and Zhao (1999)

- **Price Greeks for level-dependent volatility.**

– Bergman, Grundy, and Wiener (1996)
– Grundy and Wiener (1996)

- **Strike price Greeks.**

– Breeden and Litzenberger (1978)
– Schroder (1995)

- **Peters, Edgar E. *Chaos and Order in the Capital Markets.* John Wiley & Sons (1991*).***

IMPORTANCE

The objective of this paper is to understand the use of five most important, and commonly used Greeks, namely, Delta, Gamma, Theta, Rho, and Vega. This paper focuses on explaining the Greeks, the concepts, their uses, their importance, and improvements and suggestions to the existing structure. The Greeks are vital tools in risk management. Each Greek measures the sensitivity of the value of a portfolio to a small change in a given underlying parameter, so that component risks may be treated in isolation, and the portfolio rebalanced accordingly to achieve a desired exposure. The Greeks in the Black–Scholes model are relatively easy to calculate, a desirable property of financial models, and are very useful for derivatives traders, especially those who seek to hedge their portfolios from adverse changes in market conditions. For this reason, those Greeks which are particularly useful for hedging Delta, Theta, and Vega are well-defined for measuring changes in Price, Time and Volatility. Although Rho is a primary input into the Black–Scholes model, the overall impact on the value of an option corresponding to changes in the risk-free interest rate is generally insignificant and therefore higher-order derivatives involving the risk-free interest rate are not common.

STATEMENT OF THE PROBLEM

This tutorial is aimed at getting an instrument rated in options trading, to continue the analogy with piloting, so that you can handle any strategy scenario and take the appropriate action to avoid losses or enhance gains. It will also provide you with the tools necessary to determine the risk and reward potential before lift-off.

When taking an option position or setting up an options strategy, there will be risk and potential reward from the following areas:

- Price Change
- Changes in Volatility
- Time Value Decay

OBJECTIVES

- To gain a brief knowledge of Greeks
- Using the greeks to understand Options
- To identify the strengths and weaknesses of Greeks
- To make a trader learn how use of greeks can prove helpful while trading.

DISCUSSION

THE GREEKS

"*An option model outputs the option value, and option sensitivities, the Greeks.*" The Greeks are vital tools in risk management. Each Greek measures the sensitivity of the value of a portfolio to a small change in a given underlying parameter, so that component risks may be treated in isolation, and the portfolio rebalanced accordingly to achieve a desired exposure. For option traders, the Greeks are a series of handy variables that help explain the various factors driving movement in options prices (also known as —premiums). Many options traders mistakenly assume that price movement in the underlying stock or security is the only factor driving changes in the option's price. In fact, it's very possible to watch the option contract move up or down in value, while the underlying price stays still. Mathematically speaking, the Greeks are all derived from an options pricing model. The most well-known is Black-Scholes, but many variations are used. For equity options, it is most common to use some form of the Cox-Ross-Rubinstein model, which accounts for the possible early exercise of American-style options. Each Greek isolates a variable that can drive options price movement, providing insight on how the option's premium will be affected if that variable changes.

The most common of the Greeks are the first order derivatives: **Delta**, **Vega**, **Theta** and **Rho** as well as **Gamma**, a second-order derivative of the value function.

SIGNIFICANCE OF THE GREEKS

DELTA

Delta is the primary indicator used when monitoring option risk. Most often, Delta is used as the "hedge ratio". By taking an opposite position in the underlying instrument equal in size to the option's Delta, we immunize the position against profit or loss variability due to small movements in the market. This is often referred to as Delta hedging, or creating a Delta-neutral portfolio. Delta hedging is the same process as hedging through duration matching in a fixed income portfolio. A risk management report could summarize the total equity exposure by summing up the products of amounts exposed times the Delta's for each equity, equity index, and any options in the portfolio.

GAMMA

Delta plays the same role in approximating the sensitivity of an option's price to changes in the price of the underlying asset as duration does for measuring the sensitivity of a bond's price. In both cases, the approximation can be improved through the use of second derivatives. For bonds, the second derivative is called convexity. For an option, the second derivative is often referred to as Gamma. If Gamma is large, creating a Delta-neutral portfolio may not provide adequate immunization against asset price changes. Delta hedging can be repeated more frequently or the option position can be made —Delta- and Gamma-neutral . This is done by taking a position in the underlying asset and an option on the asset such that the Delta and Gamma of this portfolio is equal and opposite in sign to the option being hedged. Again, this is essentially the same process as matching duration and convexity to obtain an immunized fixed-income portfolio.

THETA

Theta is generally not directly used to hedge option positions. Since there is no uncertainty as to the passage of time, one does not try to hedge its effect. However, it is useful as an aid in figuring out how the value of an option depreciates as time passes, and in planning for future transactions and transaction costs to keep Delta in balance. In other words, since the option's value changes even when the underlying asset price remains the same, it is possible to separate the effect of time on the value of the option. Theta is related to Gamma in a Delta-neutral portfolio, normally with opposite sign.

VEGA

Vega calculated from historical prices, does not usually result in option prices consistent with market prices when using a lognormal pricing model which assumes constant volatility (Black- Scholes, e.g.), The reasons for this are that the market does reflect, to some extent, the non-normal distribution of returns,

and the expectation for future volatility that is different from historical volatility. An implied volatility or a matrix of implied volatilities is often calculated from the other variables used in the pricing formula (option price, asset price, time to maturity, risk-free rate, and exercise price).

Vega is not always appropriate for comparing the effect of a change in volatility on the price of different options because it measures absolute changes in volatility rather than relative changes. If the change in the option price due to a change in relative volatility is more important, normalized Vega should be used. —Normalized Vega measures the percentage change in an option value for a 1 percent relative increase (e.g. from 14% to 14.14%) in implied volatility. Normalized Vegas for in- and out-of-the-money options are often substantially larger than for at-the-money options.

RHO

Similar to Theta, Rho is not commonly used as a hedge parameter. However, it is a valuable statistic because it shows how sensitive an option is to changes in interest rates. It can be quite critical in pricing products which contain options (e.g. Equity Indexed Annuities), to understand how product margins need to change as interest rates move up and down. The derivative of price with respect to the strike price (Eta) has not been mentioned above. Also, the derivative of price with respect to carry costs is sometimes referred to as —Rho-b. Many of these derivatives have closed form formulas, depending on the underlying distribution of market returns assumed in the option valuation formula.

USING "THE GREEKS" TO UNDERSTAND OPTIONS

OPTIONS

In finance, an **option** is a derivative financial instrument that specifies a contract between two parties for a future transaction on an asset at a reference price (the strike). There are two types of options:

Call Options- The option to **buy** something, stocks, index, currency, etc., at a specific price.

Put Options- The option to **sell** something, stocks, index, currency, etc., at a specific price.

The reference price at which the underlying asset may be traded is called the **Strike price** or **Exercise price**. The process of activating an option and thereby trading the underlying asset at the agreed-upon price is referred to as exercising it. Most options have an **Expiration date**. If the option is not exercised by the expiration date, it becomes void and worthless.

Further, options can be either American options or European Options.

American Options- Options that can be exercised at any time upto or on, the maturity or expiration date.

European Options- Options that can be exercised only on the maturity or expiration date.

OPTIONS PRICING

Unlike futures, to enter into an option contract, you need to make an upfront payment called **Option Price/Premium.**

COMPONENTS OF VALUE

The premium of an option has two main components: **intrinsic value and time value.**

INTRINSIC VALUE

Intrinsic value is the value that any given option would have if it were exercised today. Basically, the intrinsic value is the amount by which the strike price of an option is in the money. It is the portion of an option's price that is not lost due to the passage of time. The following equations can be used to calculate the intrinsic value of a call or put option:

Call Option Intrinsic Value = Underlying Stock's Current Price – Call Strike Price Put Option Intrinsic Value = Put Strike Price – Underlying Stock's Current Price

The intrinsic value of an option reflects the effective financial advantage that would result from the immediate exercise of that option. Basically, it is an option's minimum value. Options trading at-the-money or out-of-the-money have no intrinsic value. For **example**, let's say General Electric (GE) stock is selling at $34.80. The GE 30 call option would have an intrinsic value of $4.80 ($34.80 – $30 = $4.80) because the option holder can exercise his option to buy GE shares at $30 and then turn around and automatically sell them in the market for $34.80 - a profit of $4.80. In a different example, the GE 35 call option would have an intrinsic value of zero ($34.80 – $35 = -$0.20) because the intrinsic value cannot be negative. It is also important to note that intrinsic value also works in the same way for a put option. For example, a GE 30 put option would have an intrinsic value of zero ($30 – $34.80 = -$4.80) because the intrinsic value cannot be negative. On the other hand, a GE 35 put option would have an intrinsic value of $0.20 ($35 – $34.80 = $0.20).

Because the values of option contracts depend on a number of different variables in addition to the value of the underlying asset, they are complex to value.

Amongst the most common models of pricing are:

- Black–Scholes and the Black model.
- Binomial options pricing model.
- Monte Carlo option model.
- Finite difference methods for option pricing.

Other approaches include:

- Heston model.
- Heath-Jarrow-Morton framework.
- Variance Gamma Model.

Trying to predict what will happen to the price of a single option or a position involving multiple options as the market changes can be a difficult undertaking. Because the option price does not always appear to move in conjunction with the price of the underlying asset, it is important to understand what factors contribute to the movement in the price of an option, and what effect they have. Options traders often refer to the Delta, Gamma, Vega and Theta of their option positions. Collectively, these terms are known as the "Greeks" and they provide a way to measure the sensitivity of an option's price to quantifiable factors. These terms may seem confusing and intimidating to new option traders, but broken down, the Greeks refer to simple concepts that can help you better understand the risk and potential reward of an option position.

FINDING VALUES FOR THE GREEKS

First, you should understand that the numbers given for each of the Greeks are strictly theoretical. That means the values are projected based on mathematical models. Most of the information you need to trade options - like the bid, ask and last prices, volume and open interest - is factual data received from the various option exchanges and distributed by a data service and/or brokerage firm. But the Greeks cannot simply be looked up in your everyday option tables. They need to be calculated, and their accuracy is only as good as the model used to compute them.

TABLE 1

Options	DEC04 <25>					JAN05 <60>					APR05 <144>				
80 calls	MktPr	Delta	Gamma	Theta	Vega	MktPr	Delta	Gamma	Theta	Vega	MktPr	Delta	Gamma	Theta	Vega
75 calls	0.05	0.14	0.11	-0.03	0.07	0.05	0.31	0.34	-0.02	0.15	0.40	10.9	2.26	-0.58	6.41
70 calls	0.10	2.46	1.33	-0.49	0.87	0.10	7.32	3.47	-0.50	2.61	1.20	23.2	3.46	-1.13	10.8
65 calls	0.45	17.3	5.57	-2.60	3.94	1.20	31.6	6.37	-2.14	7.78	2.60	40.7	4.06	-1.56	14.2
60 calls>	2.25	55.1	8.45	-4.62	6.25	3.30	59.7	5.01	-2.84	9.66	4.90	59.7	3.67	-1.78	14.9
55 calls	6.10	86.9	3.46	-2.95	3.80	6.70	80.1	2.94	-2.71	7.45	8.10	76.1	2.62	-1.75	12.7
50 calls	10.80	97.3	0.80	-1.25	1.24	11.10	92.4	1.41	-1.50	4.09	12.10	87.4	1.46	-1.31	9.11
45 calls	15.70	99.6	0.13	-0.50	0.28	15.90	97.6	0.47	-0.81	1.71	16.50	93.9	0.74	-0.96	5.69
40 calls	20.60	99.9	0.02	-0.28	0.05	20.80	99.4	0.12	-0.43	0.58	21.20	97.3	0.33	-0.66	3.14
35 calls	25.60	100	0.00	-0.21	0.01	25.70	99.9	0.03	-0.26	0.16	26.00	98.9	0.13	-0.44	1.56
75 puts	15.00	-100	0.00	0.00	0.00	15.00	-100	0.00	0.00	0.00	15.00	-89.1	5.11	0.00	0.00
70 puts	9.50	-100	0.00	0.00	0.00	10.00	-100	0.00	0.00	0.00	10.20	-78.8	3.48	-0.63	10.8
65 puts	4.90	-82.9	5.55	-2.03	3.94	5.50	-68.8	6.35	-1.00	7.78	6.60	-61.6	2.55	-0.94	14.2
60 puts>	1.65	-45.2	8.47	-3.23	6.25	2.55	-40.6	5.05	-2.03	9.66	3.90	-40.3	3.60	-1.24	14.9
55 puts	0.45	-13.1	3.45	-2.40	3.80	1.00	-19.9	2.92	-1.76	7.45	2.15	-24.0	2.61	-1.19	12.7
50 puts	0.15	-2.71	0.81	-0.96	1.24	0.35	-7.67	1.41	-1.06	4.09	1.10	-12.7	1.46	-0.95	9.11
45 puts	0.05	-0.44	0.13	-0.24	0.28	0.15	-2.40	0.48	-0.56	1.71	0.55	-6.19	0.75	-0.67	5.69
40 puts	0.05	-0.06	0.02	-0.05	0.05	0.10	-0.64	0.13	-0.20	0.58	0.30	-2.76	0.34	-0.43	3.14
35 puts	0.05	-0.01	0.00	-0.01	0.01	0.05	-0.14	0.03	-0.06	0.16	0.15	-1.13	0.14	-0.23	1.56

IMPLEMENTATION ISSUES

Certain assumptions about price distributions (lognormal) may lead to closed form solutions for the partial derivatives. Software which calculates the Greeks for lognormal return distributions is readily available (Hull reference below or internet), or can be written fairly quickly in a spreadsheet, or a programming language. The lognormal type formulas require the generation of values of the normal distribution, and there are many sources for mathematical algorithms to do this.

Other considerations would include the size and number of option positions in the portfolio, the frequency of data needed for monitoring the portfolio. As the size and frequency become larger, there is more need for automatic processes to feed the data into the monitoring system. This may justify the acquisition of a commercial system which incorporates the acquisition of market data with the determination of modelled prices and partial derivative calculation.

OPTION GREEKS AND STRATEGY SELECTION

Considering future trades, we should make sure we put trades that support our current directional bias while allowing us to stay within our comfort level and meet the following two criteria:

1. Defined risk – One should know exactly how much is at risk and should be ok with losing that money.

2. Positive Theta - The majority of our trades are positive Theta because we can make money even when we're wrong. That doesn't mean we can be completely wrong and make money but the time erosion factor offsets the amount we may be losing as the trade goes against us and thus gives the trade time to go our way.

As we're considering trades, it's important to know what affect each strategy will have on the portfolio. The following table summarizes the basic effect one can expect and gives a starting point for selection of a strategy.

CONCLUSION

The Greeks help to provide important measurements of an option position's risks and potential rewards. Once you have a clear understanding of the basics, you can begin to apply this to your current strategies. It is not enough to just know the total capital at risk in an options position. To understand the probability of a trade making money, it is essential to be able to determine a variety of risk-exposure measurements.

Since conditions are constantly changing, the Greeks provide traders with a means of determining how sensitive a specific trade is to price fluctuations, volatility fluctuations, and the passage of time. Combining an understanding of the Greeks with the powerful insights the risk graphs provide can help you take your options trading to another level. Getting a firm grasp on your Greeks will help you judge what option is the best to trade, based on your outlook for the underlying. If you don't contend with the Greeks, though, you could be flying into your next option trade blind.

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