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Non-Performing Assets of Indian Commercial Banks: A Critical Evaluation

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Abstract

The issue of Non-Performing Assets (NPA) in the banks is discussed. The magnitude and trend in NPA are studied for the 5 year period 2008-13, using a suitable classification of the banks. A critical evaluation of the reasons and a few recommendations are made which have positive practical implications.

Key words and Phrases: Asset Quality, Capital Adequacy Ratio, Development Envelopment Analysis, Doubtful Assets, Financial Intermediation, Financial Sector Reforms, Interest Rate Spread, Loan Servicing and Collateral, Loss Assets, Non-Performing Assets, Private Sector Banks, Public Sector Banks, Sub-standard Assets.

Introduction

The last decade has seen many positive developments in the Indian Banking sector. The policy makers who comprise the Reserve Bank of India (RBI), Ministry of Finance and related government and financial sector regulatory entities have made several notable efforts to improve regulation in the sector which compares favorably with banking sector in the region on metrics like growth and profitability. However NPAs remain a cause for worry. This study evaluates and compares the NPA of public and private sector banks during the recent years and makes some suggestions for NPA management.

The banking system in India is significantly different from that in other Asian countries because of the country specific geography socio-economic characteristics. India has a large population and land-size, a diverse culture and extreme disparities in income which are marked among its regions. There are high levels of illiteracy in a large segment of its population but, at the same time, the country has a large reservoir of managerial and technologically advanced talents. About 35 percent of the population resides in metro and urban areas and the rest is spread over several semi-urban and rural centers.

These features have left the Indian banking sector with strengths and weaknesses. A big challenge facing Indian banks is how to attain operational efficiency suitable for modern financial intermediation under the current ownership structure. While it has been relatively easy for the public sector banks to recapitalize given the increase in NPAs, as their Government dominated

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ownership structure has reduced the conflicts of interest that private banks would face.

After the merger of New Bank of India with Punjab National Bank during the era of Financial Sector Reforms, the number of Public Sector Banks (PSBs) became 27. This is reflected in the market valuation. While the bonus for this change lies mainly with bank managements, an enabling policy and regulatory framework will also be critical to their success. Comparisons of bank performance based on financial ratios suffers from the limitation that ratios might overstate performance because of inaccurate reporting of NPAs or because NPAs trend to be lower in the initial years in the case of newly established banks.

The NPAs are considered to be an important parameter to judge the performance and financial health of banks. The level of NPA is one of the drivers of financial stability and growth of the banking sector. This paper adopts an empirical approach to the analysis of NPAs of public and private banks in India.

Overview of Literature

Bloem & Gorter (2001) suggested that a more or less predictable level of non-performing loans, though it may vary slightly from year to year, is caused by an inevitably large number of wrong economic decisions by individuals and plain bad luck, inclement weather and sudden price changes for certain products. Under such circumstances, the holders of loan can make an allowance for a normal share of non-performance in the form of bad loan provision or they may spread the risk by taking out insurance. Enterprises may well be able to pass a large portion of these costs to customers in the form of higher prices.

Koeva (2003) in his study on the performance of Indian Banks during Financial Liberalization, gives new empirical evidence on the impact of financial liberalization on the performance of Indian commercial Banks. The analysis focuses on examining the determinants of bank intermediation costs and profitability during the liberalization period. His empirical results suggest that ownership type has a significant effect on some performance indicators and that ownership type has a significant effect during financial liberalization. This has been associated with lower intermediation costs and profitability of the Indian banks.

Ghosh (2003) empirically examined non-performing loans of Indian public sector banks in terms of various indicators such as asset size, credit growth, macroeconomic condition and operating efficiency. Mohan (2004) points out that although public sector banks have recorded improvement in profitability efficiency in terms of intermediation costs and asset quality in the year 1990 they continue to have higher interest rate spread but at the same time earn lower rates of return, reflecting higher operating costs. Consequently asset quality is weaker so that loan loss provisions continue to be higher. This suggests that there is enough scope for enhancing the asset quality of banks in general. Public sector banks in particular need to further reduce the operating costs.

Kumar (2004) in his article on an evaluation of the financial performance of Indian private sector banks noted that Private sector banks play an important role in development of Indian economy. After liberalization, the banking industry underwent major changes in the public and the private sectors as per the recommendations of Narashimam Committee. The Indian banking industry was dominated by public sector banks earlier. But the situation has changed now: new generation banks which use technology and professional management have gained a reasonable position in the banking industry.

Vradi & Nagarjuna (2006) in their study on measurement of efficiency of banks in India concluded that in the modern world, performance of banking is very important to stabilize the economy. In order to see the efficiency of Indian banks, they examined the force indicator profitability, productivity, assets quality and financial management for all banks in India for the period 1999–2003. For measuring efficiency of banks they adopted Development Envelopment Analysis and found that public sector banks are more efficient than other banks in India.

Singh (2006) has suggested the alternative measures for improvement in the banking industry. His study evaluated the performance of banks against benchmark and ratio analysis was employed as the tools. The analysis of the NPA observed the decline in post

liberalization period. The study insisted that the ideal level benchmark is less than 1 per cent; the segments curtail the growth rate of NPAs and followed certain policy like counterparts who had not only arrested the NPA but reduced them.

Singh (2007) examines the performance trends of the Indian commercial banks for the period 1997-98 to 2004-05. His broad empirical findings are indicative in many ways. First, the increasing average annual trends in technical efficiency for all ownership groups indicate an affirmative geniture about the effect of the reforms process on the performance of the Indian banking sector. Second, the higher cost efficiency accrual of private banks over nationalized banks indicate that the nationalized banks, though old, do not reflect their learning experience in their cost minimizing behavior due to inefficiency factors arising from government ownership . This finding also highlights the possible stronger disciplining role played by the capital market indicating a strong link between market for corporate control and efficiency of private enterprise assumed by properly right hypothesis. And finally, that concerning the scale elasticity behavior, the technology and market based results differ significantly.

Mitra & Ravi (2008) have noted that a stable and efficient banking sector is an essential precondition to improve the economic level of a country. They have evaluated the efficiency of 50 Indian banks. The efficiency can be analyzed and quantified for every evaluated unit. The aim of this paper was to estimate and compare efficiency of the banking sector in India. The analysis was to verify the hypothesis whether the banking sector fulfills its intermediation function to compete with the global players. The results are adequately insightful to the financial policy planner and identify priority area for different banks to improve the performance.

Vohra and Dhamu (2012) emphatically point out that the NPAs have a direct impact on profitability, liquidity and equity of the banks. The authors observe that NPA of Indian banks are relatively very high by global standards. Thus, they recommend restricting of lending operations only to secured advances with adequate collateral securities. They also list a few common reasons for an asset turning NPA, considering economy, industry, borrower and lender sides separately.

Objectives of the study

- To study the performance of commercial banks in India
- To examine the asset quality for commercial banks in India
- To find out the health of various categories of loan assets that contribute of NPA
- To suggest some measures for NPA management

Non-performing Loan: A Theoretical Perspective

A credit transaction involves a contract between two parties, the borrower and the creditor, subject to a mutual agreement on the *terms of credit*. These are defined over five critical financial parameters: *amount of credit, interest rate, maturity period, frequency of loan servicing and collateral*. Optimizing decision pertaining to the terms of credit could be different for the borrower and the banks. As such, the mutual agreement between the borrower and the bank may not necessarily imply an optimal configuration for both. At this juncture, a distinction between a defaulter and a non performing loan account is in order. A *default* entails violation of the loan contract or the agreed terms of the contract, while a non performing loan entails that the borrower does not renege format of the loan contract but fails to comply with the repayment schedule due to evolving unfavorable conditions. However the perspective of corporate finance is that both the cases of defaulter and non performer imply similar financial implications viz. financial loss to the banks. Moreover, in the Indian context, regulatory and supervisory process does not focus on such a distinction between the defaulter and non-performer as far as prudential norms are concerned. The Non-performing Loan (NPL) is defined as an amount past due, taking into account either no payment of interest or principal, or both. The most important reason for default could be a mismatch between borrowers' and creditors' terms of credit.

Nationalized Banks

In July 1969, 14 banks each with a deposit base of Rs.50 crores or more were nationalized. Again in the year 1980, six more private banks were nationalized bringing up the total number to twenty. These Banks were: Bank of Baroda, Punjab National Bank, Bank of India, Canara Bank, Central Bank of India, Indian Bank,

Indian Overseas Bank, Syndicate Bank, UCO Bank, Allahabad Bank, United Bank of India, Oriental Bank of Commerce, Corporation Bank, Vijaya Bank, Dena Bank, Bank of Maharashtra, Andhra Bank, Punjab & Sind Bank and, State Bank of India with its subsidiaries.

Public Sector Banks

Public sector banks are the ones in which the government has a major holding. They are divided into two groups: nationalized banks and State Bank of India and its associates. Among them, there are 19 nationalized banks and 8 State Bank of India associates. Public Sector Banks dominate commercial banking in India.

Private Sector Banks

Private sector banks came into existence to supplement the functions of public sector banks and serve the needs of the economy better. As the public sector banks were merely in the hands of the government without any incentive to make profits and improve the financial health. The main difference is that public sector banks follow the RBI rules strictly but Private sector banks could have some changes, after the approval by the RBI. Private sector banks are the banks which are controlled by the private lenders with the approval from the RBI, their interest rates being marginally higher than the rates in public sector banks

Non-performing assets

Bank Assets are classified into two categories:

Performing assets are those assets on which interest or installments are correctly paid by a customer within stipulated time. **Non-performing assets** are those assets on which interest or installments have been due for a period of more than 180 days.

- An asset becomes Non-performing when it ceases to generate income for a bank
- It is also a credit facility in respect of which the interest and / or installments of principal have remained 'past due' for a specified period of "two quarters".

Presence of NPAs indicates adversely asset quality of the balance sheet and hence future income generating prospects. This also requires provisioning which has implications with respect to capital adequacy. Declining capital adequacy adversely affects shareholder value and restricts the ability of the bank/institution to access the capital market for additional equity to enhance capital adequacy. If this happens for a large number of financial intermediaries, then, given that there are a large number of inter-bank transactions, there could be a *domino* kind of effect. Low capital adequacy will also severely affect the growth prospects of banks and institutions. The level of NPA acts as an indicator showing the bankers' credit risks and efficiency of allocation of resources, because it is a loan which is due or outstanding from the customer beyond a stipulated time. In other words, NPA is a result of asset-liability mismatch. Accordingly some treat NPA as an asset because it indicates the amount receivable from the defaulters.

NPAs, also called non-performing loans, are loans, made by a bank or finance company, on which repayments or interest is not being made on time. Loan is an asset for a bank as the interest payments and the repayments of the principal create a stream of cash flows. It is from the interest payments that a bank makes its profits. Banks usually treat assets as non-performing if they are not serviced for some time: if payments are late by a stipulated period, a loan is classified as *past due*.

NPA and Banks

Non-performing Asset is called so because it is an "Asset" which does not bring substantial income to its owner and is just dormant. Basically, it has something that should work but which does not. The RBI has issued guidelines to banks for classification of assets into four categories. Out of these four, the following three are considered as NPAs: (a) Sub-standard Assets, (b) Doubtful Assets and (c) Loss Assets.

Sub-standard Assets: Originally a sub-standard asset was one, which was classified as NPA for a period not exceeding two years. With effect from 31 March 2001, a sub-standard asset was one, which remained NPA for a period not exceeding 18 months. With effect from 31 March 2005 the norms have been further tightened and a sub-standard asset is one, which has remained NPA for a period not exceeding 12 months.

Doubtful Assets: Initially a doubtful asset was one, which remained NPA for a period exceeding two years. With effect from 31 March 2001, an asset is to be classified as doubtful, if it had remained NPA for a

period exceeding 18 months. With effect from March 31, 2005, the norms have been further tightened, and an asset would be classified as doubtful if it remained in the sub-standard category for 12 months.

Loss Assets: A loss asset is one where loss has been identified by the bank or internal or external auditors or the RBI inspection but the amount has not been written off wholly. In other words, such an asset is considered uncollectible and of such little value that its continuance as a bankable asset is not warranted although there may be some salvage or recovery value.

Standard Assets: The fourth category of loan accounts, which is not included in NPA category, is Standard Assets (one which does not pose any problems and which does not carry normal risk attached to the business).

Distinction between Gross and Net NPA

Gross NPA is the amount outstanding in the borrowers' account, in books of the bank other than the interest which has been recorded and not debited to the borrowers' account. **Net NPA** is the amount of gross NPAs less (1) interest debited to borrowers' and not recovered and not recognized as income and kept in interest suspense, (2) amount of provisions held in respect of NPAs and (3) amount of claim received and not appropriated.

The RBI defines Net NPA as equal to Gross NPA – (Balance in Interest Suspense account + DICGC/ECGC claims received and held pending adjustment + Part payment received and kept in suspense account + Total provisions held). This is generally reported as a ratio to net advances.

Gross NPA Ratio = (Gross NPA / Gross Advances) * 100
Net NPA Ratio = (Net NPA / Net Advances) * 100

The ideal value of net NPA is 0 and for practical purpose a benchmark is taken as 1 per cent. Thus, the values of net NPA which are less than one may be considered as satisfactory and the values exceeding 1 percent indicate a situation calling for improvement by reducing the NPA.

Trends in NPA

Next, we examine the gross and net NPA of Indian banks for the five year period 2008-2013. The relevant figures are given in table form and also displayed diagrammatically.

Table 1: Group-wise Gross NPA of Indian Commercial Banks from 2008-13

Banks	2008-09	2009-10	2010-11	2011-12	2012-13
Public Sector Banks	2.10	2.28	2.32	3.17	3.84
Private Sector Banks	3.25	2.97	2.45	2.08	1.91
Foreign Banks	4.30	4.26	2.54	2.68	2.97

Figure 1: Group-wise Gross NPA of Indian Commercial Banks

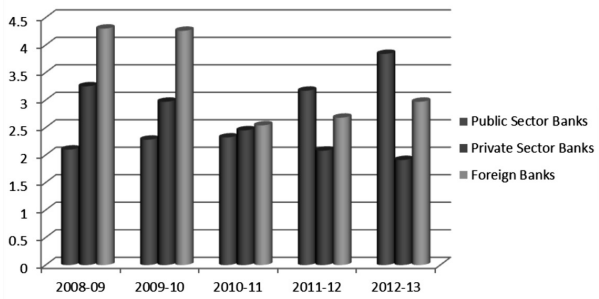


Table 2: Grass NPA of all scheduled Commercial Banks 2008-13

Year	2008-09	2009-10	2010-11	2011-12	2012-13
Gross NPA %	2.31	2.50	2.35	2.94	3.23

Figure 2: Grass NPA of all scheduled Commercial Banks

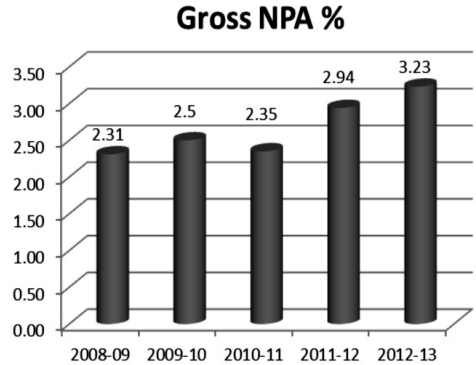


Table 3: Net NPA of Commercial Banks: 2008-13

Banks	2008-09	2009-10	2010-11	2011-12	2012-13
Nationalised	0.94	1.10	1.09	1.53	2.02
Old Private Sector	1.40	1.09	0.56	0.42	0.45
New Private	0.90	0.82	0.53	0.58	0.77
Foreign	1.81	1.82	0.67	0.61	1.01

Figure 3: Net NPA of Commercial Banks

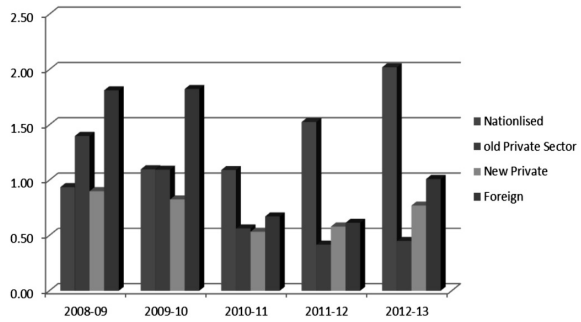


Table 4: Group-wise sub-standard Loan Assets of Banks: 2008-13

Banks	2008-09	2009-10	2010-11	2011-12	2012-13
Public Sector Banks	0.93	1.1	1.1	1.7	1.89
Private Sector Banks	2.02	1.48	0.6	0.58	0.56

Figure 4: Group-wise sub-standard Loan Assets of Banks

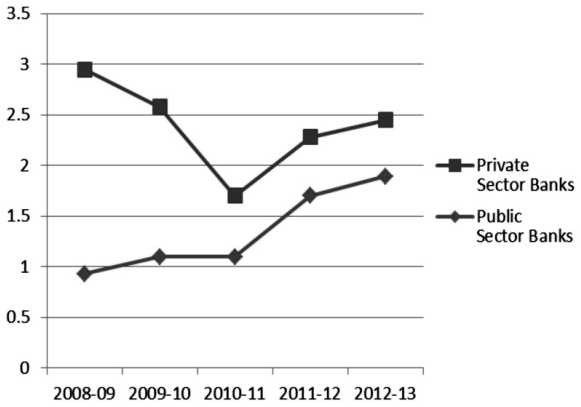


Table 5: Group-wise doubtful Loan Assets of Banks: 2008-13

Banks	2008-09	2009-10	2010-11	2011-12	2012-13
Public Sector Banks	0.99	0.98	1.04	1.33	1.81
Private Sector Banks	0.96	1.12	1.46	1.17	1.06

Figure 5: Group-wise doubtful Loan Assets of Banks

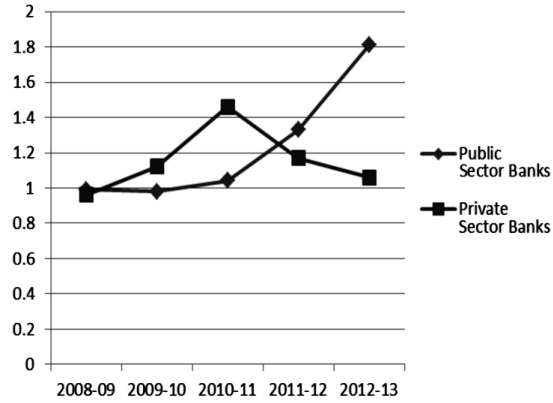
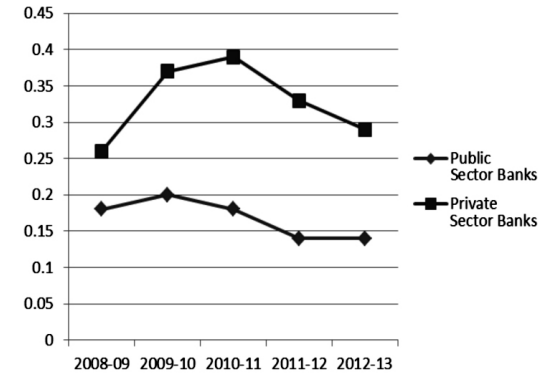


Table 6: Group-wise Loss Assets of Banks: 2008-13

Banks	2008-09	2009-10	2010-11	2011-12	2012-13
Public Sector Banks	0.18	0.20	0.18	0.14	0.14
Private Sector Banks	0.26	0.37	0.39	0.33	0.29

Figure 6: Group-wise Loss Assets of Banks



Discussion

A close look at the gross and net NPAs reported in tables 1-6 reveals the following relevant points:

1. The NPA (both gross and net) of public sector banks shows a marked rising trend during the 5 year period 2008-13. Clearly, this is an undesirable and disturbing aspect. In contrast, the other three sectors (old and new private banks, foreign banks) display a falling trend, indicating a concerted effort by these banks to reduce the NPA.
2. The private sector banks particularly those which are new have the NPA often less than one percent, which points to their efficiency of NPA management.
3. On pooling the figures, the GPA for all scheduled banks (figure 2) shows a steadily rising trend with an exception for the year 2010-11; when it was marginally lower than that in the previous year.
4. The group-wise sub-standard loan assets of the banks show an upward trend for public sector banks. The trend is reverse for the private sector banks, a feature in keeping with the contrasting positions regarding NPAs.
5. The group-wise doubtful loan assets have recorded an increasing trend in the case of public sector banks as a group. In the case of private sector banks, the trend has been upward for the first three years followed by a welcome falling trend. Also it is noteworthy that the public sector banks showed a better position than the private sector until the year 2011-12, when the latter gained the ground to be below the public sector banks.
6. Finally, with reference to group-wise loss assets, the public sector stands more favourably than the private sector (whose curve is entirely above that of the former). Individually, each of the two sectors displays a wavering trend.

NPAs pose a serious danger to the banking industry. A recent assessment (The Hindu, July 2014) of the gross NPAs for public sector banks puts the total figure at a whopping Rs.2,04,000 crores. In Karnataka state alone, there are more than 180 defaulters, each with dues exceeding Rupees One crore. NPAs deserve utmost attention, since bad loans ultimately affect the economy of the country.

Recommendations

For better management of NPAs, it is useful to first assess the causative factors for NPAs so that the corrective actions can be taken accordingly. The following steps may help for a better NPA management.

1. Developing a reliable and up to date information system.
2. Employing a tested credit risk evaluation system, which is capable of incorporating dynamic market conditions.
3. Establishing a sound control and feedback mechanism.
4. Creating an environment of trust and confidence.
5. Monitoring the assets continuously and making serious efforts for recovery of NPAs.
6. Putting in place a rigorous screening process before granting credit.
7. Public sector banks may emulate some of the effective steps taken by their private sector counterparts in this regard.

Scope for further work

The problem of NPA has far reaching implications for the banking sector and hence to the economy of the country. Further studies may examine bank-wise norms and practices to manage NPA. In particular the focus may be on a critical comparison between public and private sector banks in this respect. This may throw up some latent factors that can help to tackle the NPA problem more effectively. In the conceptual platform, the inter relation between NPAs and Capital Adequacy Ratio may be closely examined the check whether the latter can be a lever to the former.

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The Role of Spurious Products in Rural Retailing-A Study

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Abstract

When taking the subject of rural marketing in India, everyone related it to the enormous size and demand base as it brings huge opportunities to marketers. Huge revenue is generated in this field owing to the majority of population residing in rural areas. This brings about the threat of counterfeits and pass-offs, the knowledge of which is of utmost importance to the consumers in this part who tend to go about the purchasing based on the look, design and many more features of a brand. Recently, researchers have paid increasing attention to rural marketing, but the rural marketing domain has unique characteristics that require industry specific knowledge development. Marketers in this area face unique challenges in every aspect of rural marketing. Rural marketing, from the point of view of spurious products is an under researched area within the rural marketing discipline. The authors attempt to identify various issues relating to spurious products by examining previously published research in conjunction with the data collected in rural Karnataka state, relying on survey data collected from 310 retailers and 1,620 rural consumers across Karnataka state, the authors find that multi-brand wholesalers, suppliers are the key players behind the whole issue and examine the various methods to reform situations by offering various suggestions based on this research. Rural marketers can use this detailed discussion to fight effectively against counterfeits and pass-offs.

Key words: Spurious products, FMCG, Haats, Logos and Signs.

Introduction

Indian rural market with its colossal size and demand base offers tremendous opportunities to marketers. Almost 65 percent of India's consumers live in rural areas and almost (or nearly or about) one third of the national income is generated from rural India. It is only natural that rural markets form an important part of the total market of India. Everyone sees it as a profusion of opportunities, whether for marketing of durables, textile and garments, personal care products and financial services.

The rural marketer is facing an entirely different set of conditions and problems when marketing in rural areas as compared to urban areas. There are many challenges that FMCG companies face in tackling rural markets, namely their small size, remoteness, poor connectivity, tremendous heterogeneity, low level of literacy, too many languages and dialects, low per capita disposable incomes, acute dependence on the monsoon, seasonal demand and media darkness are some serious limitations.

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Rural consumers are basically illiterate and identify a product by its logo, colour and packaging. This makes it easy to sell look-alike products to them. As per Nachlappan (2003) basically there are two types of spurious products which are counterfeits and pass-offs. Counterfeits are fakes that use the similar name, design, colour, trademark and logos. Pass-off products are fakes that use similar sounding names, designed with almost similar colour and packing to deceive or mislead the rural consumers. In other words who fills spurious stuff into the branded packing. Spurious products are increasingly attacking the ₹ 90,000 crore FMCG, drugs, pesticides sector. They damage the brand reputation, create public health hazards and this loss to the government is estimated to be around Rs. 2,700 crore annually in the form of unpaid excise, octroi, sales and other tax. Today the fake products under popular brand names constitutes to a parallel industry in India. Most of them give higher margins to the retailer that varies between 25-75%, with lower end consumer prices.

Objectives of the Study

The following are the objectives of the study that the researcher wishes to enquire and understand in the process.

To understand the role of spurious products in rural retailing with respect to the following broad outlines:

(i) Reasons for selling spurious products; (ii) Sources of supply of spurious products; (iii) Identifications of spurious products by consumers; (iv) Repetitive purchase of spurious products; (v) Awareness regarding hazardousness nature of spurious products; (vi) Receipt of complaint regarding on usage of spurious products; (vii) Nature of complaints regarding spurious products, and (viii) Purchase sources of spurious products.

Research Methodology

Nature of Study

The study is exploratory in nature as it endeavors to uncover the latent behavioural aspects of rural consumers and retailers with respect to the role of spurious products in the state of Karnataka.

Universe of Study and Population

The universe of the study is rural retailers and consumers in the rural villages of Karnataka. The universe of the study is classified as North Karnataka, South Karnataka, East Karnataka and West Karnataka. The scope of the study is limited to role of spurious products in rural areas. The study is based on the empirical survey of 200 villages situated in the state of Karnataka.

Primary Data Source

First hand information was obtained from respondents through a structured questionnaire. An interview schedule was constructed to elicit information from the respondents. The researcher had to construct two sets of questionnaire; one for eliciting information from the rural retail respondents and another distributed across all strata of consumer respondents, the strata decided by the distance to the nearest town and every seventh household in the selected strata. The questionnaire contained different sections and each section concentrated on particular aspect of the retailing and buying behavior of spurious products.

Pilot Study

Before scaling for full research, the researcher initiated a pilot study with 30 rural retail respondents and 100 rural consumers. These collected questionnaires were analysed to determine whether the data collected helped the researcher in fulfilling the objectives of the study, apart from testing the validity of the questions put across to the respondents – both rural retail respondents and rural consumers.

In this section, the researcher discusses the results of the survey with reference to the validity of the questionnaire and profiles of the respondents and retailers simultaneously with the researcher discuss the testing of the proposed hypotheses. The validity of the questionnaire was adjudged using Cronbach's coefficient (α) calculated to test the reliability and internal consistency of the responses. Cronbach's coefficient having a value of more than 0.5 is considered adequate for such exploratory work. The values of α in this study for the three reported questions were found to be 0.736, 0.805and 0.765 giving an average value of 0.768. It implies that there is a high degree of internal consistency in the responses to the questionnaire.

Sampling Plan

The sampling plan adopted for the survey was stratified two-stage. The census villages were the first stage units (FSUs), while households were the second stage-sampling units (SSUs). The selection of villages was done with probability proportional to population (with replacement), based mainly on the 2001 census list of villages. For first stage units, the sampling frame of the strata was the 2001 census list of villages. The sample blocks were selected by simple random sampling without replacement, also in the form of two independent sub-samples. The list of villages were listed in spreadsheet (MS Excel) and random numbers generated. The condition by which a sample (village) is included is based on the condition whether the random number generates a value greater than 0.5. If the random number generated is less than 0.5 for an assigned village, the village is excluded from the sample.

For fulfillment of the research objective, the rural consumer respondents have been selected from different villages of the four regions viz., North, South, East and Western part (clusters) of Karnataka state. For the second stage, 400 households within each cluster were selected. The selection of households is designed to capture almost all cross sections of rural consumers and their buying behavior residing in the villages of Karnataka state. A total of 4-10 households have been visited per village, based on the size of the village. To elicit the data, questionnaire is administered to rural consumers. For selection of household the researcher selected every 7th household in the sample villages chosen.

In order to understand the retailer's role, the researcher covered three hundred and twenty retail shops across two hundred villages to study the rudiments of rural – retail channel. In covering each village, an attempt was made to contact two to five retailers depending upon the number and type of shops existing in the village.

Sample Size

The researcher has arrived at a sample size of 1600 for rural consumer respondents and 320 for rural retail respondents from among four zones of Karnataka state comprising approximately 200 accessible villages.

Analytical Method

The data collected is initially organized in a meaningful manner with the help of software. Once organized, the researcher tabulated the frequencies, which provided the requisite profile of the data collected and helped the researcher build the contingency tables for further detailed analysis. On performing detailed analysis, patterns from the data is further put for validation through testing of hypothesis, wherever the researcher deemed important and based on the conditions set for such test.

Data Analysis and Interpretation

Table No.1: Package Reading Habits of the Rural Consumer Respondents

	Frequency	Percent
No	568	35.5
Yes	1032	64.5
Total	1600	100.0

Table No.2: Details Observed in General by the Rural Consumer Respondents on the FMCG Wrapper While Purchasing

	Date of Manufacturing and Expiry		Brand Name		Logos/ Signs		MRP	
	F	%	F	%	F	%	F	%
No	280	17.5	512	32.0	528	33.0	160	10.0
Yes	752	47.0	520	32.5	504	31.5	872	54.5
Total	1032	64.5	1032	64.5	1032	64.5	1032	64.5
	Ingredients		Special Offers		Net Weight		ISI Mark	
	F	%	F	%	F	%	F	%
No	848	53.0	544	34.0	816	51.0	808	50.5
Yes	184	11.5	488	30.5	216	13.5	224	14.0
Total	1032	64.5	1032	64.5	1032	64.5	1032	64.5

Source: Field survey

Inference

The intention of the researcher in constructing Table 2 is to understand what information the rural consumer observes on the FMCG packing while purchasing. 54.5% of the respondents indicate that predominantly look for MRP, 47% indicating they look for date of manufacturing and expiry, 32.5% indicating their search for brand name, 31.5% indicating their search and confirmation for logos and signs on the package of FMCG and 30.5% indicating that they look for special offers. Only 14%, 13.5% and 11.5% indicate that they look for ISI mark, net weight and ingredients on the package of FMCG while purchasing them.

Table No.3: Test of Significance: Education Level of the Rural Respondents on Observed Details on the Fmcg Wrapper

The intention of the researcher in constructing Table 3 is to understand the pattern of response for the kind of packing reading habits of the rural consumer respondents classified on the basis of education of the rural consumer respondent. To understand the significance as to the influence of education on packing reading habits, the researcher constructed the following hypothesis and used Pearson chi-square test to prove or disprove the hypothesis.

H0: There is no significant influence of the education on the package reading habits of the rural consumer respondents.

H1: There is a significant influence of the education on the package reading habits of the rural consumer respondents.

Peason Chi-Square Tests

		Observed details on the FMCG wrapper
Education Status	Chi-square	598.281
	df	48
	Sig.	.000

Results: Since the tabulated value of χ^2 is 598.281 with 48 degrees of freedom with a significance level of 0.000 which is lesser than the set significance of 0.05 (95% confidence limit) for tabulated relationship, the null hypothesis is rejected and the alternative hypothesis accepted.

Table No.4: Recognition of Brands by The Respondents

	Reading		By Colour		Logos/ Picture/ Trademark	
	F	%	F	%	F	%
No	544	34.0	784	49.0	832	52.0
Yes	1056	66.0	816	51.0	768	48.0
Total	1600	100.0	1600	100.0	1600	100.0

	Packing Style	
	F	%
No	1160	72.5
Yes	440	27.5
Total	1600	100.0

Source: Field survey

Inference: From Table 4, it is evident that 66% of the rural consumer respondents recognize brands through reading, 51% recognizing through colours, 48% through scanning of logos/pictures/trademark and 27.5% indicating that they recognize brands through packing style of the product.

Brand Recognition and Sale of Products at MRP

Table No.5: Package Reading Habits of The Rural Consumers as Per The Opinion of Rural Retail Respondents

	Responses		Percent of Cases
	N	Percent	
Date of Manufacturing	73	11.9	27.3
Date of Expiry	65	10.6	24.3
MRP	232	37.8	86.9
Special Offers	212	34.5	79.4
Net Weight	21	3.4	7.9
ISI mark	11	1.8	4.1
Total	614	100.0	230.0

Source: Field survey

Inference

The intention of the researcher with Table 5 is to understand from the rural retail respondents what indicators does the consumers look on the packing while purchasing the product. Researcher from the study and discussion have understood the following factors can

be observed on the packing, viz – date of manufacture, date of expiry, MRP, special offers, net weight and ISI mark. From Table 5.15.1, it is evident to the researcher that 37.8% of the consumers meticulously observe MRP, followed by 34.5% observing special offers and 11.9% observing date of manufacturing. Only 10.6% observed date of expiry on the packs of products that they are purchasing.

Table No.6: Method of Recognition of Brands by Rural Consumer Respondents as Per The Opinion of Rural Retail Respondents

	Responses		Percent of Cases
	N	Percent	
Reading	236	21.8	74.9
Colours	289	26.7	91.7
Logo/ Pictures	298	27.6	94.6
Packing	199	18.4	63.2
Other Means	59	5.5	18.7
Total	1081	100.0	343.2

Inference

The intention of the researcher with Table 6 is to understand how consumers recognize the brands as per the perception of rural retail respondents. Researcher has identified that the following are means by which a brand can be easily recognized, viz – reading, colours, logo/pictures, packing and other means of recognition, which are not included in the above. From Table 6, as per the observation of the rural retail respondents, 27.6% recognize the brands by looking at the pictures or logos, followed by colour of packing with 26.7% responses, 21.8% through reading and 18.4% responses stating the identification of products through packing.

Table No.7: Reasons for Selling Spurious Products

	Responses		Percent of Cases
	N	Percent	
More Margin	251	26.6	92.3
Availability	106	11.2	39.0
Credit facility provided	128	13.5	47.1
Low Price	203	21.5	74.6
Customers Preference	195	20.6	71.7
Others	62	6.6	22.8
Total	945	100.0	347.4

Inference

The intention of the researcher in constructing Table 7 is to understand the reasons why rural retail respondents sell spurious products. From the study, vide Table 7. 26.6% of the respondents stated that they required more margin, followed by low price with 21.5% responses. The other three major reasons as attributed by the rural retail respondents are customer's preference, credit facility offered by the dealer of spurious product and availability with 20.6%, 13.5% and 11.2% respectively.

Table No.8: Test of Significance: Capital Employed by the Retailers on Reasons for Selling Spurious Products

Researcher here tries to understand the influence of capital outlay on reasons for selling spurious products. To test the above interaction the researcher constructed the following hypothesis and used Pearson Chi-Square analysis to prove or disprove the hypothesis.

H0: There is no significant influence of capital employed on reasons for selling spurious products.

H1: There is a significant influence of capital employed on reasons for selling spurious products.

Pearson Chi-Square Tests

		Capital Outlay
Reasons for selling spurious products	Chi-square	35.371
	df	24
	Sig.	.063

Result

Since the tabulated value of α^2 is 35.371 at 24 degrees of freedom with a significance level of 0.063, which is greater than set significance of 0.05 (95% confidence limit) for the tabulated relationship, the null hypothesis is accepted and alternative hypothesis is rejected.

Table No.9: Sources of Supply for Spurious Products

	Responses		Percent of Cases
	N	Percent	
Multi brand whole sellers	241	48.9	90.6
Distributors	68	13.8	25.6
Manufacturers	20	4.1	7.5
Traveling Sales Men	125	25.4	47.0
Others	39	7.9	14.7
Total	493	100.0	185.3

Source: Field survey

Inference

The intention of the researcher in constructing Table No.9 is to understand in brief the major sources of supply of spurious products. From discussion with rural retailers and on further investigation, the researcher has narrowed down on the following as the source of supply of spurious products – multi-brand whole sellers, distributors, manufacturers, traveling sales men and other miscellaneous sources not covered by the earlier specific sources (shops at haats). 48.9% of the respondents stated that multi-brand whole sellers as their major source of spurious products, followed by traveling sales men with 25.4% responses and distributors with 13.8% responses. Only 7.9% and 4.1% of the respondents indicated their source of spurious supply as other miscellaneous source and manufacturers.

Table No.10: Identification of Spurious Products by Customers

	Responses		Percent of Cases
	N	Percent	
Reading	194	29.1	71.3
Colours	136	20.4	50.0
Logos and Pictures	176	26.4	64.7
ISI Mark	49	7.3	18.0
Usage Experience	101	15.1	37.1
Other Means	11	1.6	4.0
Total	667	100.0	245.2

Source: Field survey

Inference

The intention of the researcher with Table No. 10 is to understand how the rural consumers understand whether a product is spurious or not. From analysis, discussion and study, the researcher has devised the following parameters to gauge, viz – reading, colours, logos and pictures, ISI mark, usage experience and other means which have been not covered by the above parameters. 29.1% of the rural retail respondent indicated that the consumers identify whether a product is spurious by reading the contents of the package, followed by 26.4% by looking at the logos and pictures, 20.4% through the pattern of colours and 15.1% through usage experience. Only 7.3% and 1.6% indicated the use of ISI mark and other means to recognize whether a product is spurious or not.

Table No.11: Repetitive Purchase of Spurious Products

	Frequency	Percent
Not at all	25	7.8
Only in emergency	5	1.6
Some times	91	28.4
Frequently	134	41.9
Always	17	5.3
Total	272	85.0

Source: Field survey

Inference

The intention of the researcher from Table 11 is to understand the repetitive purchase nature of spurious products by consumers. As per the rural retail respondents, 41.9% of the responses indicated that the consumers frequently purchases spurious products, followed by 28.4% stating that they sometimes purchase spurious products and 5.3% stating that they always purchase spurious products. Only 7.8% of the responses indicated that the consumer would not purchase spurious products at all, once he recognizes that the product supplied to him was spurious.

Table No.12: Test of Significance: Identification of Spurious Products on Repetitive Purchase

The intention of the researcher is to understand whether there is any significant impact of identification

of spurious product and repetitive purchase pattern of spurious products. To test the above statement, the researcher has constructed the following hypothesis and to prove or disprove the hypothesis the researcher has employed Pearson Chi-Square test.

H0: There is no significant influence of identifying spurious products and repetitive purchase pattern of spurious products.

H1: There is a significant influence of identifying spurious products and repetitive purchase pattern of spurious products.

Pearson Chi-Square Tests

		Identification of spurious products
Repetitive Purchase Pattern of Spurious Products	Chi-square	189.700
	df	24
	Sig.	.000

Result

Since the tabulated value of χ^2 is 189.700 at 24 degrees of freedom with a significance level of 0.000, which is lesser than set significance of 0.05 (95% confidence limit) for the tabulated relationship, the null hypothesis is rejected and alternative hypothesis is accepted.

Table No.13: Awareness of the Rural Retailer Respondents on Hazardous Nature of Spurious Products Vended

	Frequency	Percent
Not Aware	80	25.0
Not at All	125	39.1
Slightly	49	15.3
Moderately	18	5.6
Total	272	85.0

Source: Field survey

Inference

The intention of the researcher is to understand the perception of hazardousness of using spurious products from the angle of rural retail respondents. From Table 13, the researcher can infer that 39.1% of rural retail respondents indicate that there is no harm on using the spurious products that they sell, followed by 25% indicating that they are not aware of any hazardousness of using the spurious products that they are selling and 15.3% stating that they are slightly hazardousness. Only 5.6% of the respondents indicated that the spurious product that they sell is moderately hazardous.

Table No.14: Receipt of Complaints Regarding Usage of Spurious Products

	Frequency	Percent
No	85	26.6
Yes	50	15.6
Sometimes	137	42.8
Total	272	85.0

Source: Field survey

Inference

From Table No.14, the researcher intends to understand the whether there arises any complaint from the consumers who have used spurious products. 42.8% of the rural retail respondents stated that they sometimes receive complaints, followed by 26.6% of the rural retailers indicating that they do not receive complaints and 15.6% stating that they do receive complaints regularly from consumers who have used spurious products.

Table No.15: Nature of Complaints Regarding Spurious Products

	Responses		Percent of Cases
	N	Percent	
Regarding Quality	123	36.4	65.8
Regarding Health	34	10.1	18.2
Usage Uncomfortability	181	53.6	96.8
Total	338	100.0	180.7

Source: Field survey

Inference

The intention of the researcher in constructing Table 15 is to understand the nature of complaints that are received from consumers who use spurious products. 53.6% of the respondents stated that the consumers complain about usage uncomfortability, followed by 36.4% of the respondents indicating quality related complaints and 10.1% regarding health related complaints on using spurious products.

Table No.16: Relationship Between Annual Household Income and Brand Recognition Habits

The intention of the researcher is constructing Table No: 16 is to understand the extent of correlation between the annual house hold income of the rural consumer respondents and the means used by the rural consumer respondent in recognizing a brand. To test for a liner relationship and its strength the researcher constructed the following hypothesis and used a Pearson correlation coefficient to prove of disprove the hypothesis.

H0: There is no significant correlation between annual household income of the rural consumer respondent and means by which the rural consumer respondent recognizes a brand.

H1: There is a significant correlation between annual household income of the rural consumer respondent and means by which the rural consumer respondent recognizes a brand.

Correlations

		Recognise Particular Brand				
		Reading	By Colour	Logos/ Picture/ Trademark	Packing Style	Other Identification
Annual House Hold Income	Pearson Correlation	.384(**)	-.397(**)	-.351(**)	-.220(**)	-.005
	Sig. (2-tailed)	.000	.000	.000	.000	.834
	N	1600	1600	1600	1600	1600

** Correlation is significant at the 0.01 level (2-tailed).

Result

As the tabulated value of Pearson correlation coefficient for recognizing the brand through reading is 0.384, with a significance level of 0.000; -0.397 for recognition of brand by colour with a significance level of 0.000; -0.351 for recognizing brands through logos and signs with a significance level of 0.000; -0.220 for recognizing brands through packing style with a significance level of 0.000, all of these having a significance values less than 0.05, the null hypothesis is rejected and the alternative accepted. In case of recognition of brands through other identification techniques, with a Pearson correlation value of -0.005, with a significance level of 0.834, which is greater than the set significance of 0.05, the null hypothesis is accepted and the alternative rejected.

Inference

From Table No: 13 the intention of the researcher is to understand the significance of correlation between annual household income and recognition of brands through- reading, colours, logos, pictures and trademarks, packing style and other identification techniques. From Table No: 13 it is evident to the researcher that there is a moderate negative correlations between annual house hold income and recognizing a brand through colour with a Pearson correlation coefficient of -0.397, recognizing a brand through logos, picture and trademark with a Pearson correlation coefficient of -0.351 and recognizing a brand through packing style with a Pearson correlation coefficient of -0.220. There is an observable very low negative correlation between annual household income and recognizing a brand through other identification means with a Pearson correlation coefficient of -0.005. There is a moderate positive correlation between annual household income and recognition of brand through reading with a Pearson correlation coefficient of 0.384. As the tabulated significance has lead to the rejection of null hypothesis the researcher can safely infer that there is a significant correlation between annual household income and recognition of brand through reading, colours, logos, pictures and trademarks, and packing style.

Summary of Findings

1. 45% of the rural consumer respondents attributed minor importance to packing, 25% attributing a major importance, 17.5% attributing not much significant and 12.5% attributing packing as not at all important.
2. 98.5% of the rural consumer respondents preferred sachets, 97% preferred loose packs, 47.5% preferred poly packs and 25% preferred plastic jars.
3. 64.5% of the rural consumer respondents observe the written descriptions while purchasing FMCG and 35.5% do not observe the packing of FMCG while purchasing.
4. 54.5% of the rural consumer respondents look for MRP, 47% look for date of manufacturing and expiry, 32.5% look for brand name, 31.5% look for logos and signs and 30.5% look for special offers.
5. There is a significant influence of the education on the packing reading habits of the rural consumer respondents.
6. 66% of the rural consumer respondents recognize brands through reading, 51% recognizing through colours, 48% through scanning of logos/pictures/ trademark.
7. 26.6% of the rural retail respondents required more margin, 21.5% favoured low price, 20.6%, due to customer's preference, 13.5% since spurious product suppliers offered credit facility and 11.2% due to availability of spurious products.
8. There is no significant influence of capital employed on reasons for selling spurious products.
9. 48.9% of the rural retail respondents point to multi-brand whole sellers as their major source of spurious products, 25.4% relies on traveling sales men, 13.8% on distributors, 7.9% indicate miscellaneous source and 4.1% of the respondents indicate other sources.
10. 29.1% of the rural retail respondents indicated that the consumers identify spuriosity of a product through reading the contents on the package, 26.4% by looking at the logos and pictures, 20.4% through the pattern of colours, 15.1% through usage experience, and 7.3% indicated the use of ISI mark.
11. 41.9% of the rural retail respondents' responses indicated that the consumers frequently purchase spurious products, 28.4% sometimes purchase spurious products, 5.3% always purchase spurious products and 7.8% of the consumers were not purchasing spurious products at all, on recognizing that the product supplied to him was spurious.
12. There is a significant influence of spurious products' identification and repetitive purchase pattern of spurious products.
13. 39.1% of rural retail respondents state that there is no harm in using the spurious products, 25% are not aware of any harmfulness by using the spurious products, 15.3% state that they are slightly harmful and 5.6% indicated that the spurious products that they sell is moderately hazardous.
14. 42.8% of the rural retail respondents stated that they sometimes receive complaints, 26.6% do not receive complaints and 15.6% do receive complaints regularly from consumers who have used spurious products.
15. 53.6% of the rural retail respondents indicate that the consumers complain about usage uncomfortability, 36.4% indicated quality related complaints and 10.1% of the complaints regarding health related problems.

Suggestions

1. Evidence from this study shows that majority of rural consumers ask for just about any product rather than the brand while buying FMCG, , this is one of the important factor for pushing pass-off and spurious or counterfeit and regional brands by the retailers. Still majority of rural consumers recognise brands by packing, logos, trademarks and colours, it is suggested to the marketers to adapt colours, logos, trademarks, pictures while targeting the rural mass.
2. In most of the cases spurious products are pushed by the multi brand wholesalers in the feeder towns

and district headquarters because of huge margin involved in this parallel channels. They act either as a merchant middle man or manufacturers of spurious products. This issue is very important from their perspectives because of big margin in spurious products. Even with this regard product's name in local language can also make a difference in creating consumer awareness and making a sustainable customers-base in rural areas. It is strongly suggested to educate these distributors or wholesalers about hazards of the spurious products.

3. Yet another way to counter this spurious bane is upgrade packaging i.e., more sophisticated and capital-intensive technology should be employed by the marketers. Therefore it is suggested to adapt high quality techniques in packaging for the products while marketing in rural areas in order to make the manufacturers of these counterfeit difficult to replicate major brands.

4. The major complaints about spurious products are quality of the product, uncomfortability in usage and health hazards. As health hazards is of major concern strong measures like adoption of villages and recruitment of educated rural youths to address these issues to the rural masses by the marketers. Therefore, in this regard, it is suggested to employ product's name in local languages and dialects to create consumer awareness.

Conclusion

This empirical study has filledin the gap that arises out of standardisation of marketing practices at the urban and rural markets. The problem that FMCG brands face in the Indian market is quite like the problem the film and music industry, faces with piracy, pharmaceuticals and agriculture inputs with look-alike or totally spurious, and toy industry, lubricants battles with look-alikes. The channels of distribution that can be successfully deployed to reach these untapped pockets require ingenuity and creativity. The means by which the products are identified or recognized in the rural masses are different from that of the urban masses. This provides a reasonable opportunity for pushing spurious products, which needs to be controlled. Study also highlights that, rural retailers are stocking spurious products because of more margins, its low price and availability of credit from the suppliers. Spurious products are mostly pushed by the distributors in the feeder towns. It is evident from the study that the law is stringent but its enforcement is weak not only in rural areas but even in urban areas. Finally, counterfeiting can only be tackled effectively if law enforcement agencies and private companies work together and share important information in this regard. The marketers who understand the rural consumer and fine tune their branding strategies by incorporating rural element while developing packaging strategies specifically for rural markets are sure to reap fruitful benefits in the ensuing years.

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Application of TQM in Resolving e-Commerce Challenges

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Abstract

e-COMMERCE is facing a number of challenges today. Although, the future of retailing in India lies in e-Commerce, its current penetration is not encouraging. The giants and the pioneers in e-Commerce are struggling today with a number of issues. These issues and many other challenges can be resolved with the help of the doctrine of TQM. The study addresses to various quality issues of the web sites which are neglected to fulfil the requirements of the customers, and propose Total Quality Management (TQM) implementation as the best solution to sort out the issues.

KEYWORDS & PHRASES

TQM, e-Commerce, penetration, Security, Internet Users & Consumers.

Introduction

According to a survey by industry body ASSOCHAM, the e-Commerce market in India has grown to an astonishing figure of $ 16 billion in 2013, clearly indicating a boom in the online retail trends and defying slower economic growth and spiralling inflation. "The increasing Internet penetration and availability of more payment options boosted the e-commerce industry in 2013," ASSOCHAM Secretary General D S Rawat said.

"Besides electronics gadgets, apparel and jewellery, home and kitchen appliances, lifestyle accessories like watches, books, beauty products and perfumes, baby products witnessed significant upward movement in last one year," Rawat said. According to the survey, India's e-commerce market, which stood at $2.5 billion in 2009, reached $8.5 billion in 2012 and rose by 88 per cent to touch an astonishing figure of $16 billion in 2013. The survey has estimated that the country's e-commerce market to probably reach $56 billion by 2023, driven by rising attraction towards online retail.

To make the most of increasing online shopping trends, more companies are collaborating with daily deal and discount sites, the survey pointed out. "Having close to 10 per cent of Internet penetration in India throws a very big opportunity for online retailers to grow and expand as future of Internet seems very bright," Rawat said.

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Online business sells to individuals. It is the indirect trade between the company and consumers. The basic concept of this model is to sell the product online to the consumers. Amazon.com has been able to sell books and many other items directly from its warehouse to people. The internet is changing how logistics and supply chains work since the "middle man" or distributor is eliminated by selling products directly from the factory to the end consumers, i.e., B2C – Business-to-Consumer.

e-Commerce has several benefits, but it is having several quality issues as well. We propose Total Quality Management (TQM) as the solution. TQM is a set of guiding principles for continuous improvement. It is a customer driven philosophy wherein the stress is ultimately on customer delight. TQM has a tremendous potential to generate the improvements in the process of e-Commerce. TQM focuses on meeting the needs of the customer. TQM is not inspection, but actually the prevention of defects, involving everyone in the organization.

Total Quality Management (TQM) comprises customer focus and continuous improvement. Hence, quality begins with understandings of customer's requirements upon which the performance goal for the organization is based. Variation in quality is controlled by using statistical methods. Continuous improvement begins with statistically defined current process and identifies the future modifications to the process that might reduce the defects and increases the predictability of the performance. In this research paper the concept of TQM and e-Commerce is explained. It discusses the issues of the quality in E-commerce. Finally, it analyses the applicability of TQM in the e-commerce (B2C). According to the survey by ASSOCHAM, as per responses by 3,500 traders and organised retailers in Delhi, Mumbai, Chennai, Bangalore, Ahmedabad and Kolkata who participated in the survey, online shopping grew at a rapid pace in 2013 due to aggressive online discounts, rising fuel prices and availability of abundant online options.

Among the cities, Mumbai topped the list of online shoppers followed by Delhi, while Kolkata ranked third, the survey found.

The age-wise analysis revealed that 35 per cent of online shoppers are aged between 18 years and 25 years, 55 per cent between 26 years and 35 years, 8 per cent in the age group of 36-45 years, while only 2 per cent are in the age group of 45-60 years. Besides, 65 per cent of online shoppers are male while 35 per cent are female.

The products that are sold most are in the tech and fashion category, including mobile phones, ipads, accessories, MP3 players, digital cameras and jewellery, among others, it found. India has Internet base of around 150 million as of August, 2013, the survey said.

"Having close to 10 per cent of Internet penetration in India throws a very big opportunity for online retailers to grow and expand as future of Internet seems very bright," Rawat said.

Those who are reluctant to shop online cited reasons like preference to research products and services online (30 per cent), finding delivery costs too high (20), fear of sharing personal financial information online (25) and lack of trust on whether products would be delivered in good condition (15), while 10 per cent do not have a credit or debit card.

This paper attempts to analyze the benefits of implementing total quality management principles in e-business. Majority of leading companies are implementing customer focused quality management principles. Cost reduction, improve quality, efficiency and customer satisfaction are the core benefit of total quality management (TQM). TQM have helped many companies to improve their competitiveness (Yang, 2003). E-commerce helps to find new customers and it enhances the improvement of services for the existing customers.

An Organization survives because of its customers. A service sector has to have regular orders to keep its wheels moving. Hence, ISO 9000:2000 incorporated customer focus as an improvement. A customer is satisfied if his implied needs are satisfied and he becomes a goodwill ambassador for the Organisation. Basically, a customer is satisfied by the use of a product and the service associated with it. With reference to

the service , time utility, place utility and the price play a pivotal role in customer satisfaction, wherein he looks for 'value for money'.

Some of the building blocks of TQM are (i) act always in line with the needs of the customers (ii) do right the first time by focussing on zero defect' banner (iii) involve all participants in the enterprise (iv) measure 'value-added'. The objective is to attain performance level of the highest order so that the Organisation attains market leadership.

The success of TQM involves commitment of employees as well as commitment from the top because the objective of a service organisation maximizing its performance regarding customer satisfaction. This can be achieved only by understanding the customers' stated and implied needs and developing a user-friendly customer-oriented products and services.

The Total Quality Management system believes in rewarding performance. The reward need not be always monetary. A healthy, sincere appreciation can go a long way in boosting morale. A non-performer has to be tactfully dealt with in improving performance. Comparing himself unfavourably with fellow colleagues actually has a demoralising effect that will ultimately affect the overall performance of the Organisation.

Some of the points of Edward Deming to reach world class standards in performance can be applied to e-commerce. They are: (i) achieve a constancy of purpose (ii) learning of new philosophies in management in terms of growth (iii) reduce the number of vendors in terms of delivery of goods. Have only those who are committed and reliable (iv) Improve supervision but, at the same time, drive out fear from the minds of the employees (v) Improve communication with internal and external customers (vi) Use relevant statistical tools to eliminate defects in the system (vii) act on feedback given by the customers

Value Analysis

From the customers' viewpoint, value can be seen into two parts: one the 'musts', which are the basic requirements, regarding the service and two: the 'wants', which are the desirable features about the service. Hence, the service provide should fit for the use of the customer and the user-friendliness decides about the market leadership.

From the Organisation perspective, the products or services marketed have certain internal factors to be taken into consideration. This pertains to optimum utilisation of internal resources. Most important is the type of labour which may cost the organisation in terms of quality and competency. Applying productivity techniques such as kaizen, muda, mura, poka yoke, jidoka will help in improving performance of the work-force.

The various methods of implementing value analysis could be as follows: (i) simplify operations (ii) standardize procedures (iii) reduce lead times (iv) eliminate unnecessary wastage in time (v) seek fruitful and practical solutions from employees (vi) use 'ergonomics' to improve performance at delivery points

One thing which is important in any organisation is 'change' or 'improvement' as otherwise, an organisation will be obsolete, outdated and would not survive for long in this fierce competitive world. Hence, 'continuous improvement' should be the way of life for any world class organisation. ISO 9000-2000 has made it compulsory for organisations going for certification to have evidence that they are practicing the Deming's P-D-C-A cycle, as this practice inculcates the practice of continuous improvement.

Challenges in e-Commerce

Logistics and fulfilment are the largest challenges in India when it comes to the arena of e-commerce, with more than half of all online retail sales being done using cash on delivery (COD). While COD is essential in a nascent e-Commerce market, it can have a large negative impact on business margins. This is exacerbated in a nascent market where consumers are testing this new medium of ordering goods, as the return rates can be quite high. In India, reportedly, the return rates can vary from 5% to more than 25%, depending on the category, the demographics of the online buyers, and their online tenure.

The biggest challenge in e-commerce industry is

the extent of reverse logistics and the fact that it is increasing with every passing day, especially after the advent of COD mechanism, the instances of the same are on a rise. This is very evident in India more because of the customers' ignorant attitude to 'try out' the service.

Reverse logistics are often more time sensitive than getting the goods to the customer in the first place. This is because of the risk of obsolescence, or usability, of the returned goods. This is one of the many factors that motivate and compel e-commerce providers to outsource their reverse logistics setup. Returning goods back to the manufacturer creates problems for the manufacturer in terms of finding the exact reason for the return. Many times it could be the customers' fault in ordering the incorrect product.

A significant part of reverse logistics involves trashing the goods collected from customers. Waste has always been a contentious issue with ever changing legislation. As a result, a specialist reverse logistics provider is usually in a better position to dispose off a product in a manner that is compliant with regulation.

Interestingly, the mark-ups that reverse logistics providers use often tend to be higher than the original mark-up by the ecommerce merchant. This is not really the anomaly as it seems, since the e-commerce merchants could get saddled with returned goods. Once these goods start piling up, the e-commerce merchant would not be able to continue his usual business owing to the finance blocked in these goods.

Two key lessons have to be looked into with regard to traditional logistics: responsibility and information accuracy. Brick-and-mortar companies understand that someone has to own the order fulfilment process and proper monitors need to be in place. In an environment where logistics operations are being managed internally, there is a logistics manager who tracks, among many things, where each order is in the supply chain at any given time. This manager has ownership of the business architecture, design and acquisition of the systems and processes for tracking orders.

Instead, if an organization outsources fulfilment to a third party logistics provider, someone must still be responsible for managing the relationship with the provider. This manager identifies the points of contact where information will flow back and forth between the two organizations. The customer also sets the performance metrics on which the relationship will be evaluated.

While order fulfilment is ultimately about getting product from its source and delivering it to the customer, maintaining and providing accurate order management information is really the key to keeping the promise to the customer. Accurate information management requires agreement between all e-fulfilment. The competitive advantage involves accuracy (e.g. 95% vs. 100%), ownership, timeliness and distribution of the information, immediacy of updates, maintenance of confidentiality and security, and a variety of other factors that must be carefully designed and planned.

Order fulfilment responsibility and information accuracy are traditional priorities that have many times got lost in the world of e-commerce. Tomorrow's winners realize this and are taking action to fix the problem. This is essentially a by-product of the improper processes by the outsourced logistical partner. There are instances of goods beings delivered to the consumer in a damaged state. This abstains the consumer to go for online purchase especially in case of fragile goods.

With an increase in the e-fencing of stolen merchandise, attention has recently turned to the role of Internet marketplaces such as eBay and Overstock in combating. These marketplaces take various measures to combat the sale of stolen and fraudulently obtained goods—not solely by organized retail criminals—on their websites, including educating sellers and consumers, monitoring suspicious activity, and partnering with retailers and law enforcement.

For instance, these marketplaces may provide guidelines for website use that would require users to acknowledge policies regarding goods that may or may not be sold through the website. In addition, online markets may create filters to search for prohibited items up for auction. They may then take actions such as removing the prohibited items, sanctioning the policy

violator, or referring the case to law enforcement. E-Bay has created such filters based on input from regulatory agencies, law enforcement agencies, the retail industry and member reports.

Fulfilment is probably the most important aspect of an e-commerce business because it is probably the last a thing customer remembers about his interaction. For example, If a waiter in a restaurant has been exemplary for an entire meal, but inadvertently takes five minutes too long to bring the cheque, the customer is probably going to have a poor opinion about the restaurant. Likewise, if everything about the e-commerce site is in-place, but the customer has experienced a bad fulfilment experience, he is not going to blame the fulfilment company.

Vendors may make mistakes by sending the wrong items, or by sending too many or too few. Or, items may get damaged during delivery to the fulfilment centre. How will the fulfilment company handle this? In fact, will they even know if an item is damaged? Or, will they know if a change was made to the packaging? All such acts will not be known till the customer complaints. If control is lost over such an essential part of e-business, the organisation is destined towards major problems.

For e-commerce to meet its potential in the next several years, it is going to require greater amounts of bandwidth both in backbone networks and in local access connections to users. The best starting point is to identify the infrastructure product most employed by business users to build networking capabilities. The most common building blocks used to construct or permanently connect to e-commerce networks (e.g. Internet, Intranets etc.) are private lines which are leased from telecommunication carriers (i.e. leased lines).

TQM Resolutions to e-Commerce Challenges

TQM offers effective measures in improving e-commerce in terms of satisfying the customers' needs. Some of the measures that can be applied are as follows

1. Order receiving and processing

A customer generally assumes many aspects of his order. When he places an order, he is generally under the impression that he has given all the necessary details along with the order. The service provider must use the S.M.A.R.T. principles in analysing the order: Specific, Measureable, Accurate, Realistic, Time-bound. In case of any clarification, the customer should be contacted to confirm the order. The principle should be 'do-right-the-first-times. This will avoid customer dissatisfaction and return of goods.

2. Committed employees

The service provider should train and motivate employees in serving the customers to fulfil their wants. An employee should be appreciated and rewarded for his good work. The management should have empathy towards the employees and be proactive towards their genuine needs. The management should shun bureaucratic attitude and, where required, interact directly with the employees. Working-alongwith-people is more important today rather than working-above-people. The top management is doomed if it allows its ego to mix with its position while dealing with employees.

3. The 5S principle

5S is a part of lean management as it eliminates wastes. It stands for the five Japanese words: SEIRI (tidiness) , SEITON (Orderliness) , SEISO (Cleanliness) , SEIKETSU (Standardization) , SHITSUKE (Discipline). When applied, these principles actually reduce the cost. These should become an organization culture. In fact, one of the biggest advantage is that it helps in S.K.U – Stock-Keeping-Unit as it helps to spot-the-required-stock immediately.

4. Kepner-Tregoe Method of Problem Solving

K-T Problem Analysis is a systematic method to analyse a problem and understand the root cause of the issue instead of making assumptions and jumping to conclusions, which is still common place even today. This method has become very popular in IT and technical fields, but can be applied to a wide range of problems.

The same structure of Problem analysis is used in DMAIC and has been proved many times over in the field. Furthermore specific aspects of the Problem Analysis method can be used to greatly improve and

strengthen these other problem solving methods. It is a habit of the management to attack the 'symptoms'. Rather than understand the 'root cause' of the problem. This is more so in service industries.

5. Performance Measures

Adequate performance measures regarding reducing of defects in delivery, customers' complaints regarding packaging, delays in attending to customers' requirements, inefficiency in employees regarding conforming to set-standards of work, etc. Statistical control charts for variables and attributes can be designed to improve performance. This should be backed by training, brain-storming sessions, suggestion-cum-reward schemes, which will help in improving performance.

Conclusion

Today, the customer is a part of the business. The survival of an organisation depends upon the satisfaction level of the customers which is very important for service industries. In fierce competitive world, a customer has many options today. Hence, a committed customer is very important for a service organisation.

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Impact of Information Technology on Power Management in Karnataka with Special Reference to KPCL

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Introduction

The power sector is considered very critical for the economic development of the country. Because of this criticality, it is essential that the sector need to continuously achieve high degree of productivity and efficiency in its operations. Adoption of Information Technology is one of the key drivers to achieve productivity and efficiency improvements.

India is a rare example of a large country where the electricity supply industry continues to function essentially like a group of government departments. The most problematic area in the electricity sector has been the operational and financial performance of the State Electricity Boards (SEB). Since the State has been directly regulating most SEB activities, they are prone to political interference of varying degrees as suited to populist objectives. From day-to-day operational matters to tariff setting, all are susceptible to such interventions.

Despite the economic reforms introduced in 1991, India's power industry has not been able to reach an adequate level of electricity supply. In 2003-2004, India had an energy shortage of 7.1% and a peaking shortage of about 11.2% and in 2010-2011, peak electricity supply fell short by 9.8% and there was an overall shortage of 8.5% in supply.

There are multiple reasons for this level of performance of this sector. These can be classified as internal and external factors. Typically, the internal factor relates to operational characteristics of the power sector and the external factors bring out the influence of government policy on this sector.

Internal Factors

- **Excess manpower:** Excess manpower is attributed to influence the productivity of performance. Typically in India it is highlighted that overstaffing occurs in all areas and most prevalent in support functions.
- **Poor organization of functions and tasks:** This is a reflection of how the internal functions are managed in the Indian power sector. This is reflected in capacity utilization, deployment of manpower and cost to construct a plant.
- **Lower capacity utilization:** Plant Load Factor for SEB is 60 percent compared to 71 percent for private and central government – owned plants. Three major reasons to explain the low PLF are poor maintenance, time taken for maintenance and unable to get coal.

**This is synopsis of Ph.D. thesis of the author. The Symbiosis International University, Pune awarded Ph.D. degree in 2014. The thesis was prepared under the guidance of Dr. N.S. Viswanath.*

- **Inefficient deployment of manpower:** Poor internal organization also leads to lower productivity through overstaffing in operations and maintenance. This is prevalent in SEBs and to a lesser extent in central government plants. This leads to lack of viable investments and viable scale.
- **Construction overruns:** SEBs take an average of over 5 years to construct a large coal plants, versus 3-4 years of best practice Indian plants. Lack of funds, delays in tendering and antiquated engineering, procurement and construction practices are main reasons for construction overruns.
- **Over-engineering:** Redundancies and an absence of standardized plant designs are the two main examples of over-engineering. Many of the plants in India have redundancies such as boiler feed pumps (2 X 100 per cent rating or 3 X 50 per cent rating, versus 2 X 60 per cent used internationally).

External Factors

Poor corporate governance in the form of government ownership, primarily at SEBs, is the main external factor leading to low TFP in both generation and T&D. In generation, SEBs have the longest construction overruns and the lowest capacity utilization, leading to a capital productivity in generation of 57 per cent against best practice of 85 per cent of US levels. Similarly, they employ an average of four persons per MW, compared to 1 person per MW at even the old private sector plants. In T&D, as mentioned earlier, thefts from SEBs are about 20-25 per cent compared to 2-3 per cent in best practice private sector companies. A poor regulatory framework, coupled with poor implementation, is the second factor responsible for low productivity. Some secondary factors, such as government monopoly in the coal sector, excessive bureaucracy, and a non-level playing field for private sector capital goods producers, also contribute to low TFP.

Factors limiting output growth

All productivity barriers impact output indirectly, as raising productivity leads to a specific good becoming less expensive in real terms. In addition, some of the barriers mentioned above impact output directly. Government monopoly on distribution, for example, limits new generation capacity, as private players are unwilling to sell to bankrupt electricity boards. Thus, financial closure is extremely difficult to obtain. Similarly, poor governance of the government-owned SEBs causes large financial losses; the net impact is that the SEBs have no money to build new plants. Finally, the lack of a regulator leads to uneconomical tariffs. This last factor has also partly contributed to the poor financial health of some of the SEBs.

It has been widely researched and published by leading management thinkers like Michael Porter and Michael Hammer that investments in Information Technology are critical to enhance the productivity of companies and this productivity improvement can be realized by careful investments only.

Like in all other businesses, the Information Technology investments in power sector vary from company to company. However, these investments can be categorized into three general areas.

- Performance Improvement :Performance Improvement areas includes reducing cost inefficiency across all the areas of operations and for enhancing customer satisfaction
- Meeting management and regulatory requirement: IT can fulfill management and regulatory requirement areas in terms of effective MIS for decision making, accountability and service and building a strategic approach to regulatory management along with the collection and management of data.
- Servicing the changing industry structure: The changing industry structure in terms of unbundling and network management emphasis also requires the intensive use of IT.

In Power Generation companies, operations management, management reporting and asset management have seen considerable IT intervention. The areas that need to be covered are fuel and environmental management. The key issues in the use of IT in power generation relate to focus on plant control systems, non-existent operational performance systems, poorly used control system data for performance analysis, low commercial orientation

despite high data availability, and strategic focus to use IT for managing complex demand or managing the capital cost through effective project management etc.. There is a need for a comprehensive IT strategy to address requirements of performance improvement, cost management and project management in power generation companies. Inadequate research on usage of IT systems for productivity enhancement in power generation companies is another area requiring attention.

As the Indian economy gets liberalized, it is likely that the power sector too would undergo transformation. This transformation would be primarily at the policy level, at the operational level in terms of adoption of operational improvement techniques and also likely to be in the application of Information Technology to address operational and strategic requirements. It is expected that the above transformational initiatives will lead to improvement in the performance of this sector.

The Problem Statement

India is a rare example of a large country where the electricity supply industry continues to function essentially like a group of government departments. And the most problematic area in the electricity sector has been the operational and financial performance of the State Electricity Boards (SEBs). Since the State has been directly regulating most SEB activities, they are prone to political interference of varying degrees as suited to populist objectives. From day-to-day operational matters to tariff setting, all are susceptible to such interventions.

Despite the economic reforms introduced in 1991, India's power industry has not been able to attract enough private investment from domestic and foreign companies to reach an adequate level of electricity supply. In 2003-2004, India had an energy shortage of 7.1% and a peaking shortage of about 11.2%.

While India's installed power generation capacity was 112,058 MW as of March 31, 2004, the country still needs an additional 100,000 MW to meet the growing demand for electricity over the next 8-10 years. According to industry estimates, domestic and foreign private companies will need to invest a total of about $100 billion in power projects to bridge this deficit.

As mentioned earlier, the power sector has to address both the internal factors and the external factors to enhance its performance. The internal factors would lead to operational excellence as mentioned earlier. It is quite evident that the external factors would generally lead to more competition, regulation and investment. However as Michael Porter highlights, competition alone would not enhance the productivity and competitiveness of an industry in a country. So it would be very critical to look at the mechanisms to enhance the productivity of the power sector in India through operational excellence as well.

The literature survey and the analysis of the status of Information Technology in the Indian Power are not wide spread. Although there have been substantial investments, these are not accompanied by a clear strategy for enhancing operational efficiencies or enhancing customer satisfaction.

What type of Information Technology investments can lead to performance improvements and how to measure the effective usage of Information Technology remains one of the key research topics. This understanding is critical in the formulation of strategy for Information Technology investments. The essential thing would be to relate the usage of Information Technology to increase productivity performance. This has been addressed differently for different sectors. This understanding is essential for any exercise of formulating an Information Technology Strategy.

Literature Review

Six types of literature have been reviewed as a precursor to the research and the findings of this assessment is used to build the framework for the research.

- Infrastructure components – the Information Technology components in which investments are typically made to get business benefits
- Benefit framework – the services realized through Information Technology and delivered to customers,

suppliers and employees through which the business benefits are realized

- Management framework – the mechanisms for integrating the business strategy, IT strategy and IT trends & possibilities, for decision making on investments in Information Technology.
- Integrated frameworks – the mechanisms to combine all the three aspects of the IT investments – benefits, investment in infrastructure and the management drivers, into comprehensive decision making tools
- Quality management and project management framework- The mechanisms to assess the influence of IT on quality of operations and project management effectiveness.
- Information technology usage- nature of usage of IT by business organizations in general and power industry in particular in terms of processes covered, nature of solutions deployed etc.

Infrastructure components

The literature in this category indicated the IT infrastructure can be categorized into seven major components based on nature and purpose. The different research articles reviewed bring out nature of the different components and their typical trends. The components included hardware platforms, operating system platforms, software applications, data management, networking and telecommunications, internet platforms and service providers. The articles provided an excellent guidance to analyze how the different IT components are inter related and how typically investments are made in these. These articles provided insights into how to look at or plan IT investments, without looking into how these will impact the business operations. The ideas in this set of publications/articles are used to assess the investments made by KPCL in Information Technology systems.

Benefit Framework

Productivity with its multiple dimensions is the fundamental measure of technology's contribution to business performance. The wide range of research publications reviewed as a part of the research work highlight how to measure the impact of information technology investments on organizational performance using the different dimensions of productivity. These articles explore the use of tools like efficiency measurement, unconventional productivity measures, objectives driven measurement, portfolio approach, value chain analysis, measurement of quality, balanced scorecard etc to assess the productivity of IT investments. A careful assessment of these research findings revealed that many of the productivity measures can be used for measuring the performance of the power generations sector as well.

Management framework

One of the key challenges of management of business organizations is to ensure consistency across different types of decisions and aligning them with the business strategy of an organization. While investments in Information Technology are increasingly considered as a strategic investment, how to integrate this investment decision with other elements of a business strategy and capital investment process has been the focus of many research studies. This research studies focus on different elements like measuring performance improvements, improvements in the cost of products & services, capturing the actual costs of investments and the resulting value, mechanisms to assess investment effectiveness, incorporating strategic possibilities in decision, holistic planning to include Information Technology as a part of the business plan, etc. The findings from these research reports are used to understand how to incorporate the results of the assessment to make key recommendations.

Integrated Framework

The ultimate challenge for investments in information technology is to create the right mix of investments and use the limited source while providing the maximum benefits. Prior to funding, the organization must be able to answer the question "What will we get for our money?" Proper analysis will include not just the estimated spending over the system/ initiative, but it will also include the evaluation of potential business benefits, future options and relative risks. Many times investment decisions need to be made rationally and analytically, even when it cannot be made on the strengths of numbers alone. Decision analysis models,

Return on Management (ROM), boundary values or spending ratios, Parker's Model, Portfolio approach, Balanced scorecard approach are some of the models researched and documented to provide insights on how to link Information Technology Investment decisions with business benefits. Most of the research study has been in sectors like banking, finance and manufacturing and from different circumstances. It is evident that many findings from these reports have the potential to be applied to make investment decisions in the power generation sector as well.

Specific Measures of Business Performance

The usage of Information Technology is expected to influence different areas of a business especially on the operations and customer management. The two areas of interest specifically from the view point of power generation companies are the quality of operations and the project management effectiveness. Some of the research literature reviewed as a part of the current work, looks into how to measure quality of operations, how these things are related to business performance and what are the factors influencing quality of operations. Similarly, the tools and techniques used in project management, the measures of effective project management and how project management influences overall business performance are researched and documented. The findings of these research studies are highly relevant in the context of the current research since the performance of the power generation companies is expected to be heavily influenced by quality of its operations and how effectively it manages its projects for new capacity addition.

Information Technology Usage in Value Chain

The earliest work which brings out the role of Information Technology on the competitiveness of business organizations and how different elements of a value chain can be organized differently by using Information Technology is by Michael Porter (Porter 1985). The article brings out how "Dramatic reductions in the cost of obtaining, processing, and transmitting information are changing the way we do business". The article highlights that the Information Technology changes industry structure and, in so doing, alters the rules of competition, creates competitive advantage by giving companies new ways to outperform their rivals and it spawns whole new businesses, often from within a company's existing operations. Ever since that, there has been numerous research works on how to use Information Technology to alter the competitive advantage of the companies. The literatures reviewed include the usage of IT in banking, manufacturing and many service industries. The ideas from these set of research work are relevant to understand how to link the competitive positioning of companies with the deployment of Information Technology in reconfiguring the value chain of the companies. Although may not be highly applicable to highly regulated government controlled power generation companies, the ideas are relevant to understand the creative possibilities of Information Technology in power generation companies.

IT Solutions used in Power Generation

An assessment of the IT solutions used by different power generation companies indicated that specialized software or packaged solutions with a library of best practices and processes, have been developed by the leading suppliers of IT solutions/software and deployed in many power generation companies. One class of solutions are Enterprise Resource Planning (ERP) solutions covering key processes like Financial management, Materials Management, Project management, Maintenance & operations management, Asset management, analysis of operational data etc.

The highlights of the review of the literature are

- There are different approaches for identifying IT investments, for assessing business performance and for linking business performance to IT investments.
- There is a broad acceptance that Information Technology investment needs to be treated as a strategic investment and needs to be closely tied to business strategy
- Since information technology impacts a business in multiple direct and indirect ways and there are a wide variety of ways in which investments in IT systems can be carried out, it is a complex exercise to isolate these benefits and link them to specific IT investments.

- The variety of methodology developed by different researchers is generally context driven each one with its strengths and limitations.
- It is not prudent to pick one methodology and apply it to another situation and it is evident that it is impossible to choose one method which can be directly used in the context of this research.
- It is critical to use the lessons from the different research work / models/methodology and adopt them to this research work with context driven modifications, instead of using any of them directly.
- There are a variety of information technology measures available, each addressing different measures of IT business value and many of them generic in nature and can be adopted easily for this research work.
- There is no comprehensive research or methodology or careful investigation of how IT investments need to be carried out and how to assess their impact on the business performance of power generation companies.
- There are multiple ways in which a power generation company can make IT investments and the broad trend is to use enterprise resource planning (ERP) solutions which offer centralization and integration of business processes at its core value proposition.

Research Objectives

Based on this assessment of the status of IT in the Indian power sector and the critical operational requirements of the power generation companies in India, the research is aimed to analyze the different elements that will lead to the improvements in the performance of the power generation sector. The following objectives were set for the research study

- To identify the different types of investments in information technology by power generation companies
- To analyze the trends in information technology
- To examine the specific areas of performance which are influenced by the adoption of information technology

Some of key activities envisaged in the beginning and executed as part of the research were

- Reviewing the literature on this topic in a systematic fashion and developing framework/models for the research study
- Formulation of hypothesis for the research study
- Application of the frameworks and models to analyze the above mentioned objectives and test the hypothesis
- Gathering data through questionnaire and field study against different parameters envisaged in the framework/model and testing the hypothesis
- Analyzing the data and the findings and formulating the conclusions and recommendations

The research was envisaged to be a case study based exercise. The focus of the research has been detailed assessment of the impact of IT investments on the operations of Karnataka Power Corporation Limited (KPCL) – the state owned power generation organization in the state of Karnataka. KPCL was selected as the unit of study based on the following considerations

- Diversity of operations in terms of nature of power generations – it operates hydro electric, coal and diesel based thermal and wind energy stations
- Large scale operations in terms of installed capacity
- Distributed organization with operations at multiple locations
- Maturity in adoption of Information Technology – has been computerizing its operations since last two decades and has automated many of its operations

While investigating the operations of KPCL against the above mentioned objectives, the critical step has been assessing through careful review of published literature on what has been done by different researchers. The focus of the literature review has been to understand

- What constitutes investment in Information Technology?
- How are benefits of Information Technology measured by different industries?
- How do companies link the benefits to investments?

- What are the specific operational parameters against which businesses measure benefits of information technology?
- What are the operational parameters against which power generation companies measure their business performance?
- What are the frameworks used by management for decision making while investing in Information Technology?

Methodology

The methodology developed for the research study based on the survey of literature consisted of two basic streams of assessment. It consisted of development of questionnaire and data collection formats and analyzing them to assess the relationship between Information Technology investments and business performance.

- User Perspective: The structured survey of users of the Information Technology systems users to find out the impact on performance as perceived by them. This is the qualitative aspect of the research study.
- Business Results: Collection and analysis of the data on performance of the organization over the years on different parameters and assessing their relationship to Information Technology investments. This is the data driven assessment of the performance. The data on business performance is used for this purpose.

The reason for this two pronged approach to assess the impact of Information Technology on the business performance of KPCL are

1. Since the IT investments are gradual, it is likely that the IT investments would not have given any dramatic or clearly visible change in business performance over a very short period of time.
2. Since a large of employees have been in the organization for a long period and have firsthand experience of seeing the changes in business performance over a period of time and are in a position to decipher the specific changes due to IT investments, the user survey also has been used to assess the impact of IT on business performance

The key activities carried out to address the research objectives were

- Identification and assessment of the IT investments made by KPCL in different operational areas and the nature of these IT systems
- Formulation of hypothesis based on the literature survey on the impact of IT systems on the performance of KPCL
- Assessment of the performance of KPCL using the user perspective framework
- Assessment of the performance of KPCL using the business results framework
- Analysis of the results and Correlation of the results of the two approaches
- Formulation of key research findings and recommendations for further actions.

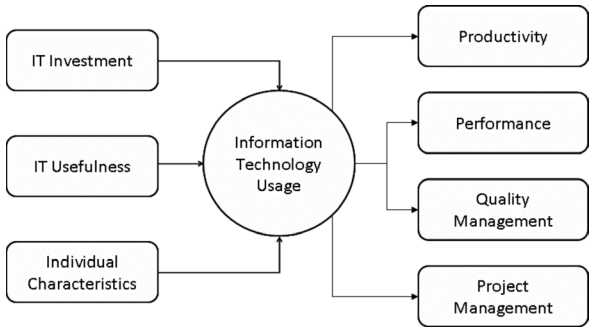

Fig 1: Framework of the research
Source: author

This research study intends to find answers to these questions in a systematic fashion by developing frameworks as indicated in the figure 1, gathering data, analyzing them and formulating the conclusions based on data and research findings.

Adoption of multiple sources of data validated research conclusions and confirmed the subjective perceptions. Multiple measures to understand the impact of information technology are: Analysis of actual data, Analysis of the perceived data and Observation and Interview of the respondents.

The methodology to assess business performance based on the user perspective consisted of

- Identification of the functional areas of KPCL using IT systems

- Formulation questionnaire based on the research hypothesis – both open ended and closed ended questionnaire
- Pilot test of the questionnaire in select location and with select respondents to assess the relevance and practicability of the questionnaire and refinement of the questionnaire based on the feedback.
- Identification of key executives of KPCL who are the users or key beneficiaries or key persons within the business processes automated by IT systems. Identification of the respondents in terms of rank, functional area and location.
- Development and administration of questionnaire to get their feedback /perception on the impact of IT on business performance
- Analysis of the results of questionnaire and the results of the feedback to build correlation on the impact of IT on business performance of KPCL.

The approach to assess business performance based on the analysis of the business results consisted of

- Identification of the functional areas of KPCL using IT systems
- Identification of business parameters of a power generation company which are likely to be influenced by these business processes.
- Collection of data on the actual business performance of KPCL against these values. This study included study of secondary data for selected years (1990-2010).
- Analysis of the data on business performance and establishing the correlation between the results and IT investments.

KPCL with its inception in 1970 set its sight on "growth from within" for meeting growing industry needs and reaching out to touch the lives of a common man. The organization is a technical IT savvy power sector company among the public sector.

- KPCL has been making IT investments over a period of time. The investments have been gradual since the inception of KPCL in terms of the technology platform, coverage of business processes, degree of automation and adoption by users. The investment pattern indicated the implementation of technology was gradual. For example some of the time lines for different IT systems are
  - 1993- Renewal of Fuel management Systems
  - 1996- Operation of VSAT Connectivity.
  - 2005- On-line Processing of Applications.
  - 2010- Using CAD 2010 Version
- A large number of key executives who are either beneficiaries or the direct users of the IT systems have been long term employees of the organization and have seen the growth and spread of IT systems over this period. More than 70% of the key users have spent more than thirty years in the organization.

KPCL has made investments in developing and deploying different Information Technology solutions. The key investments in IT systems are in the following areas

Systems for operations: Fuel Management System, Integrated Stores and Inventory Management System, Unit Generation Monitoring System, Project Generation Monitoring System, Plant Monitoring System

Systems for managing the finance: Cash & Compilation Management System, Fixed Asset Management System, Stores Accounting System, Bank Guarantee System, Provident Fund System

Systems for support activities/functions: Human Resource Management System, Hospital Management System, In-house Training system, Disciplinary Proceedings system.

Some of the key characteristics of the Information technology systems at KPCL are

- The systems cover both core operations and support functions
- Most of the activities at the corporate office are automated
- Most of the senior executives are active users of IT systems
- Most of the software solutions or modules are stand alone solutions addressing the requirements of specific business process

- Most of the solutions are run centrally and accessed by users in different locations through the network
- There a few software applications which are designed to integrate the business processes like the inventory management
- The usage of IT systems is not uniform across all the different locations of KPCL

Based on the understanding of the operations of KPCL and the assessment of the research literature in this field, a set of hypothesis hypotheses were formulated iteratively on the impact of IT on the performance of KPCL. A set of variables based on literature were identified to assess the performance of KPCL, these were tested for applicability at KPCL and modified based on the experience of using them at KPCL and the final set of hypothesis was formulated.

Hypotheses

The hypotheses of this research study are on the relationship between the investment / adoption of Information Technology in managing the companies in the power sector and the performance of these companies. These hypotheses are applicable for both the streams of research work – user perspective and business results, and reconciled against each other for final validation. Each of the final six hypotheses used for the research work are investigated in detail using a series of sub-hypotheses to explore the relationships between IT investments and business performance. The details of the sub hypothesis are the essence of the framework used for this research work.

Using these hypotheses and the research framework, this study identified the different types of investment in Information Technology in KPCL, analyzed the trends in the usage of Information Technology and examined the specific areas of performance which has been impacted by Information Technology and the areas that can be improved by the better, more or increased adoption of Information Technology.

The hypotheses used for the research work are:

H1: IT usage/investment has enabled the productivity of the organization.

H2: IT usage/investment has enhanced performance of the organization.

H3: Usage/Investment of IT has resulted in quality management.

H4: IT usage/investment has resulted in project management of the organization.

H5.: The benefits of IT varies by project location.

H6: Impact of information technology is moderate.

Research Framework

Some of key highlights of the research framework developed and used for the research work are:

Dimensions and Variables

- The parameters are identified from the review of literature, and refined iteratively by testing them in the field at KPCL
- The spread or investments in Information Technology (IT) are measured by dimensions like IT investment, IT usefulness, Individual Characteristic and Organizational Characteristics.
- The impact of Information Technology on business performance of KPCL are measured using multiple dimensions like Productivity, Performance, Quality of operations and Project Management performance
- The Productivity Dimension has been elaborated by using multiple parameters like Operational Productivity, Operational Quality Productivity, Strategic Productivity, Financial Productivity and Maintenance Productivity.
- Variables included for measuring the Performance Dimensions are Strategic measure, Organizational Support, Communication, Management Benefit and Performance Benefits Measures.
- Parameters considered for measuring the Project Management are Integration Management, Scope Management, Time Management, Cost Management, Quality Management, Human Resource Management, Communications Management, Risk Management and Procurement Management.
- The information and data of KPCL on many

measurable and recorded parameters are used to assess the business performance and validate them against the user perspectives.

Key Activities using the user perspective model

The key activities carried out as a part of the research work to assess the impact of Information Technology on the performance of KPCL using the user perspective model.

- Development and administration of questionnaires consisting of 153 open ended and closed ended questions. These questionnaire reflect the hypothesis and research framework developed based on the literature review
- The framework of the questionnaire included the dimensions and measures of the dimensions for information technology usage.
- Based on the understanding of the IT systems of KPCL the sample of persons to administer the questionnaire is taken from corporate, middle level and operational level. Stratified random sampling is used
- In an attempt to understand the impact over the years, the study included years of experience in the organization as one measure. 73% of respondents have 30 years of experience in the organization (20-29 years- 39% and 30-40- 34%).
- The sample indicated respondents who have understood the issues and problems of information technology, individuals who have experienced the real-life event in the organization
- As many as 137 Sample were taken which included 70 from Bangalore, 20 from Sharavathi generating Station, 19 from Raichur Thermal Power Station , 7 from the Yelahanka diesel generating unit and 21 from Varahi Underground Generating Station.
- All the functional departments were part of the research investigation. Among the respondents, 49% are engineers, 12% are assistant engineers,10% are systems analysts, 15% are human resource personnel, 7% are Operation & maintenance personnel and 7% are accounts personnel.
- Four semi-structured interviews and discussions with Functional heads of F&A (Finance and Accounts), HR (Human Resource), System Analysts and Company Secretary were carried out.
- The response to the questionnaire were compiled and analyzed using statistical analysis tool like SPSS
- All of the multi-scale constructs have coefficients of 0.7 and higher, indicating all the constructs has good reliability.
- Other than administering the questionnaire among the key stake holders, the research activity also included visit to the different operational units to meet and interview the users of IT systems.
- It also included study of the operations of the organization at Sharavathi Generating Station, Raichur Thermal Power Station, Varahi Underground Generating Station and Diesel generating Station during the year 2010.
- As a part of the assessment of the operations, the stake holders among Operations and Maintenance Engineers, Stores and Purchase Personnel, Executive Engineers, Functional Heads (Finance and HR), Assistant Engineer and Junior Engineers were interviewed.
- The site visit also focused on seeing the actual usage of the IT systems in the different operations of the organization.

Validity of the Research

Reliability and validity of the survey instrument is tested in terms of face validity (if the questions seem to measure what they purport to), content validity and reliability. On recommended by several researchers, multi-item scale were used. Multi-item scale can better specify the construct domain, average uniqueness of individual items, make fine distinctions between people and have high reliability. The five dimensions and the variables used multi-item scale.

Face Validity: Face validity provides a basic support for the appearance of measurement and variables. The survey research achieves face validity because its use of factors for the measurement in Power Sector are verified by pilot study by KPCL Experts.

Content Validity: Content Validity which measures the appropriateness of items in the construct domain. This is achieved in this research from referent literature or via "a panel of experts who are well versed with the domain".

Reliability: The reliability relates to the consistency and stability of a test. Reliabilities (Cronbach's a lpha coefficients) were calculated and shown in table 1). All of the 16 multi –scale constructs used have coefficients of 0.7 and higher- indicating all the constructs have good reliability. (Nunnaly, 1994).

Group Name	Mean	Variance	Std deviation	Cronbach's Alpha
Operational Productivity	29.096	16.86	4.11	0.773
Maintenance Productivity	33.462	45.99	6.78	0.863
Financial Productivity	47.99	46.96	6.85	0.874
Operational quality Productivity	28.710	20.82	4.56	0.790
Strategic Productivity	25.050	16.52	4.06	0.846
Perfomance Dimension	32.76	17.73	4.21	0.816
Total Quality Management	88.731	164.11	12.81	0.805
Integration Management	12.688	5.02	2.24	0.831
Scope Management	16.59	9.42	3.07	0.916
Time Management	8.1042	2.30	1.52	0.845
Cost Management	29.136	28.88	5.37	0.924
Quality Management	8.25	2.88	1.70	0.913
1HR Management	12.240	6.77	2.60	0.806
Project Communication Management	20.457	17.71	4.21	0.888
Project Risk Management	15.188	14.26	4.00	0.901
Project Procurement Management	51.411	72.70	8.53	0.945

Table 1.0: Reliability Statistics

Key Activities using the Business Results model: These activities carried out as a part of the research work to assess the impact of Information Technology on the performance of KPCL using the business results model.

- Based on the hypothesis and the research framework a list of parameters to assess business performance are identified
- The list is of parameters is modified using the filters like availability of information, mechanisms to measure them and the usage of IT systems by the underlying processes of KPCL.
- The timelines and period to collect the data is formulated based on the years of introduction of IT systems in the underlying business process.
- Formats are prepared and refined based on field experience to collect the data and information.
- The information and data collected are analyzed using statistical tools like SPSS.
- Some of the key parameters used for assessing the performance of the business were - IT Expenditure, Cost of Power generation, Inventory carrying costs, Sales Income, Profit after tax, O & M Expenses, Generation data, Plant Maintenance Information, Peak electric load, Capacity Addition, Plant Load factor over the years.

Research Tools Used

The study used arithmetic mean to represent the population. The variations are measured by standard deviation, skewness and kurtosis. The study involves establishing the relation between business benefits and IT usage and investment. Pearson coefficient is used to measure the magnitude of relationship.

Pearson Correlation- Is used for evaluating the relationship between

- Connect time and frequency of usage as the independent parameter and business-benefits as dependent parameter.
- Investment in expenditure in computers, peripheral equipments and financial performance as independent parameter and business results as dependent parameter.

ANOVA- Having understood the relationship, ANOVA is used to understand the variations in usage of IT usage in project locations of KPCL.

Mean-Mean is the most popular and widely used measure for representing the central tendency of the data.

Standard Deviation- Standard deviation is used for measuring the variation.

Skewness-Dispersion measures the lack of symmetry. It is measured by Karl Pearson's coefficient of skewness. In practice, the value of this coefficient lies between -1 to +1.

Kurtosis: Dispersion is measured by kurtosis.

Multiple Regression Analysis- The aggregate impact of IT investments on predicted variables such as sales, Profit After tax, Earnings Per Share, Value of failures and Plant Load Factor is done using multiple regression analysis. The impact of IT usage on business benefits are also conducted to establish the relation between IT usage and performance.

Execution of the Research

The research design adopted for this study provides the development of an inductive and deductive understanding of impact of information technology in KPCL. The data collection for this research commenced in December, 2009 and was completed at the end of December 2010. The research design as indicated in figure 2. SPSS base 16 is used to analyse issues such as cross-tabulation, descriptive, reliability and analysis of the hypotheses. Microsoft Excel is used for cause and Effect analysis.

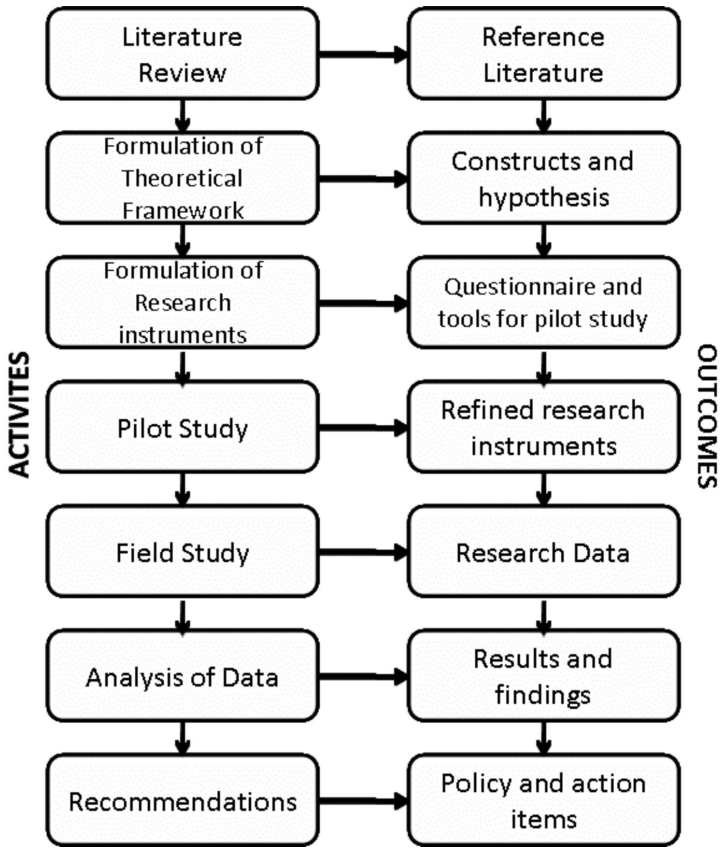

Fig 2: Systematic Description of Research Design and Methodology
Source: Author

Major Findings of the Research

The results of statistical analysis of the performance of KPCL impacted by Information Technology are

- **Financial Productivity** - Financial system packages in KPCL have helped the organization in reconciliation of accounting transaction, faster preparation of half yearly and yearly financial statements, Understanding of operational costs, understanding of working account payable and better management of account receivable.
- **Strategic Productivity** - IT applications have increased the value addition for the organization, organizational capability for process innovation and increased the organizational flexibility.
- **Operational Productivity** - IT Systems have enabled better visibility of inventory, Better management of material procurement, better vendor management and vendor performance rating and reduced marginal cost of production.

- **Operational Quality Productivity** - IT applications in KPCL have resulted in efficient human deployment, greater communicative capability and better training using presentation packages.
- **Maintenance Productivity** - The use of IT has resulted in preventive maintenance of plants/ machinery, improved management of breakdown of plants, improved management of maintenance of inventory and improved the uptime of plants/ machinery.
- **Performance** - IT usage has resulted in better performance of the organization. It has contributed to the better achievement of strategic goal and better employee satisfaction.
- **Total Quality Management** - IT systems in KPCL has resulted in clarity of work and better instruction of work, which enhanced the quality of the process.
- **Project Management** - Use of IT has resulted in integrating the project plan for a coherent document, better identification of tasks and better management of contracts.
- The usage of IT varies in different project locations. IT usage across the dimensions like maintenance productivity, performance, quality, project scope management, time management, cost management, project quality and project risk varies.
- **Business Results based on secondary data** – Statistical analysis confirmed that lower inventory carrying costs, increased sales income, higher plant load factor, higher generation performance have resulted by the investment in IT.
- **Correlation with the business benefits** - Regression analysis conducted before and after 2000 (1991-2000 and 2000-2008) confirmed that investment in IT has made an impact on sales, PAT, EPS and PLF. However, evidence available shows that there is no significance in terms of capacity addition. Hence, the critical parameters connected with KPCL are statistically positive and having a significant relationship.

Research findings based on observations

- The general conclusion has been that usage of IT in KPCL has resulted in enhancing the productivity. Performance, total quality management and Project management
- The results of the study indicated that the perception of the benefits of usage of IT in KPCL is more in terms of value-addition and validation.
- Most of the IT systems in KPCL are stand alone systems, covering the specific activities related to one or two functional areas.
- KPCL has invested in building an organization wide network to connect the computers across the organization and connect the different users located in different places to use the same IT systems. KPCL has adopted an approach of building or developing the IT systems as demanded by the business requirements.
- The interview with the respondents showed that the KPCL invested in information technology based on the need.
- The public sector organization like KPCL has its own limitation / obligations which any kind of technology requires time to resolve.
- A combination of custom in-house applications, packaged software and stand alone applications built by the user has resulted in poor integration and visibility of the information.
- Service Provider's presence in not well in more remote locations which has resulted in lesser usage of IT in real time.
- KPCL diversified investments in IT based on the needs of the business over the years, hence, the impact of IT over the years were studied instead of any cutoff years.
- Because of certain constraints of the sector, the solutions deployed and the internal systems, the complete potentials or possibilities of IT are not completely harnessed by the power generation company.

Interpretation of the results of analysis and observations

- Results show that financial system packages in KPCL have helped the organization by providing support for the financial planning, budgeting and monitoring.

- At the project level, information systems have helped in managing the uniformity across the units. It has helped in better visibility, faster operation and reduced the cost of procurement of material.
- The information technology has helped in secured and reliable transfer of information across business units to the head quarters. In a couple of places the deployment of real time systems like SCADA are found to be effective in decision making on power generation related activities.
- IT applications in KPCL have resulted in efficient human resource deployment. In addition, greater communicative ability allowed businesses to interact with others via simple tools such as email or advanced tools such as video conferencing.
- Storing maintenance information is vital for power generation utility. For example, power utility run by diesel fuel needs maintenance every 8 months. KPCL does not use any specialized packages for processing operation and maintenance information. Also at the plant level all the tripping outage and generation information is stored in Excel or log book.
- The maintenance of spare parts ensures uninterrupted production. Replenishing the inventory can be done through different ways of computer supported approaches such as decision support system, off the shelf packages etc.
- IT usage has resulted in effective inventory management by providing the visibility of inventory information to the other stake holders who need to use the inventory. Inventory visibility allows companies to be informed about their inventory in order to make the effective supply chain. By capturing, aggregating and providing visibility to inventory quantities throughout the stores, optimum inventory level is maintained across the units.
- In KPCL, packages like IIMS has resulted in reducing the material procurement cost. According to Operations and Maintenance staff "Systematic procurement of the materials has resulted in analyzing and co-ordinating of materials among all the departments.". As per the orders of the Government of Karnataka, E-procurement is mandatory for buying goods or services of an amount larger than rupees ten lakhs. This service is being used in different locations in KPCL very effectively.
- FMS, IIMS and Stores Accounting systems are widely used both in Bangalore office and project locations for storing vendor details. While FMS, keeps account of coal suppliers. Stores Accounting System keeps accounts of other suppliers, calculates the payment details etc.
- It is found that usage of application systems such as integrated inventory management system in stores have made the analysis of need based material better. This in turn resulted in systematic procurement, which in turn resulted in reduced total costs.
- Further, payment details are maintained in better manner, which has helped the organization to meet the objectives.
- Better Process Design, Better employee satisfaction, Increased level of decision making capability, better user satisfaction and reduction in the shortage of coal, better process design etc. are evident in certain pockets of the organizations.
- In order to understand the variation in the usage of information technology, ANOVA was conducted. The results showed that impact of information technology, which is measured by frequency of information technology usage and connect time is not uniform across the organization. In KPCL, applications such as CAD, STADD, FMS are widely used tools in certain locations. And also, usage of routine IT tools such as Internet access, e-mail and collaboration tool such as video conferencing is not uniform because of certain technical reasons.
- Power generation is done in KPCL using hydel, Thermal, wind and solar PV projects. For Power generation using thermal the usage of IT is comparatively more than hydro projects.
- It is also evident there has been a steady increase in the investment in IT systems, indicating the reliance of the utility on IT to improve the efficiency and effectiveness in the operations of KPCL.

- The impact of the IT systems on the performance of KPCL are due to following key characteristics of the IT systems.
  - Automation of activities/data storage as seen in fuel management system, integrated inventory management system and cash and compilation management system.
  - Centralization of information within a functional area as seen in human resource management system, bank guarantee system or the provident fund system.
- While the research results highlight moderate impact of IT on business performance across many functional areas, the variation in impact across different functional areas is visible when the IT systems are used to integrate the business processes. The impact is average when the IT systems are stand alone and vary when they are not. A case in point is the process integration through IT systems as seen in the fuel management system and inventory management system.
- While the coverage of IT usage is not uniform both in terms of access and solution deployment, the impact of the IT systems as per user perspective as well as business results has been higher when there is access and solution deployment.
- The critical impact of Information Technology other than automation of processes is in facilitating decision making. In the KPCL too the impact is seen to be higher when the IT systems facilitate decision making through provisioning of timely and accurate analytical reports.
- The impact of IT systems is seen to be higher when the adoption of IT is system is accompanies by redesign of the underlying process or when the processes have adopted best practices potential of IT systems.
- There are too many IT solutions and applications deployed at KPCL, developed and deployed as per the needs of respective business users. Whenever the users have to use multiple sources of information as dictated by the solutions, for decision making, as against the integrated solutions, the impact of IT systems on business performance seems to be affected negatively.

Recommendations of the Study

Based on the analysis of results, understanding the capability of the IT systems, need of the Power Sector and global best practices the recommendations are drawn by the researcher. To enable KPCL to harness IT systems capability more effectively and to generate greater value to its business the following recommendations are formulated.

- **Integration of business processes** - The results from various literatures indicates that integration of processes gives greater benefits. There are instances in KPCL itself where a combination of custom in-house applications, packaged software and stand-alone applications built by the user have resulted in poor integration of the business processes and poor visibility of the information. While automation is perceived to be the key objective of deploying any IT system, the integration of business processes through IT is considered to be the next cycle of investment. There are many areas where KPCL can derive value by integrating the business processes. Some of possible areas of integration of the business processes through IT at KPCL are
  - Integration of maintenance operations and asset management.
  - Integration of procurement with inventory and vendor management.
  - Integration of provident fund system with HR and payroll processes.
  - Integration of project management with asset management and with finance systems.
  - Integration of payroll, inventory, accounts payable and asset management with finance.
- **Expansion of coverage:** While integration of business processes and the IT systems facilitate centralization of data and information, expansion of coverage intends to bring more users and geographical locations of the organization into the IT fold. When the IT systems are expanded to cover more users and geographical locations, business value is derived through – user control of data, Elimination of multiple sources of data entry, increase in the accuracy and

reliability of the data. The underlying theme for expansion should be to provide access to users who generate and use the data. Some of possible areas where expansion of the IT systems makes significant sense in the case of KPCL are

- Expansion of Human resource Information system to all the employees such that some of the key information about the employees is entered and owned by the respective employees.
- Expanding the vendor management system to the vendors such that some of the information about the vendors is entered and maintained by the respective vendors themselves.
- Another dimension of expansion is to bring in the locations of the actual business activities into the system like for example expanding the project management system to all the project locations and thereby all the people involved in project management.

- **Analytical Enhancement -** Other than process automation and business process integration, the key objective of building any information technology system within a commercial organization is to facilitate informed decision making. While expansion and integration increase the possibilities of data analysis, building analytical capabilities itself should be one of the key drivers of IT investments. KPCL has built some basic analytical capabilities into most of the systems deployed in the organization. The typical outputs of these analyses will be used mainly by the respective functional users for decision making within their own functional areas. It is recommended that analytical capabilities are expanded to multiple functional areas.
- **Application Rationalization -** Application rationalization or the rationalization of IT applications, is one of the approaches to address this set of issues. Although it is not the intended objective of the research, it is recommended that KPCL should seriously explore the possibilities of using this technique for the following reasons
  - There are multiple applications in the organization built on different platform and catering to different user requirements.
  - These applications are built over a period of time with all the likelihood of some of them being already on outdated platforms or technology.
  - With most of the applications being developed in-house and undergoing incremental changes as demanded by the business users, it is very likely that these applications would have been heavily depended on a few developers or IT executives.
- **Policy for standardization -** as the footprint of the Information Technology systems increases within an organization and the number of users of the IT systems increases, it is critical to formulate standards policies for IT systems – development, deployment and usage. A close look at the role of Information Technology in KPCL, prompts to make some suggestions to this effect. Some of the possible areas are
  - Data security, information security and accessibility to organizational data.
  - Standardization for technology platforms, interfaces between different applications for data/information exchange to reduce multiplicity of platforms and non standard interfaces.
  - Development of organizational wide mechanisms to measure business benefits and standardize the policies for information technology investments.
- **ERP Adoption:** Wherever the current architecture of IT systems enable integration, that can be attempted, but the better way for KPCL will be to evaluate the possibilities of deploying integrated systems like ERPs. The key reasons for this are
  - ERPs would offer built in capabilities for integrating business processes.
  - The centralization of data can be easily achieved.
  - The ERP platform would offer the technology standardization possibilities.
  - Some of the globally popular ERP solutions bring in the advantages of best practices in many different process like costing, inventory management, HR, plant maintenance, etc.

The final outcome of the research is development of the conceptual model for the deployment of information

technology solutions in Power generation Companies. The IT deployment model is formulated by using

- The strategic requirements of power generation companies.
- The operational requirements of power generation companies.
- The strategic and operational challenges facing the power generation companies.
- The possible process and functional areas of power generation companies which can be redesigned or automated using IT systems.
- Key characteristics of IT systems which has the potential to enhance the impact on the performance of power generation companies.
- The knowledge of the functional processes of power generation companies and their influence on the overall performance of the enterprise.
- The understanding of the possibilities of deployment of IT systems in power generation companies.

The constraints of implementing enterprise wide IT systems in power generation companies. The IT deployment model, is developed by understanding the typical business requirements of the IT systems to positively influence strategic and operational requirements of business organizations. These are mapped into the four quadrants as shown in the figure 3. The four grid model indicates the relationship between operational excellence and strategic excellence are developed.

- **Strategic Alignment** - Achieving strategic excellence by crafting innovative strategies and backing them with excellence in operations as well.
- **Planning, Measurement and Analysis -** Developing creative and rigorous business plans based on the measurement and external business performance, market positions etc.
- **Operations and IT Systems -** Focusing on improving the operational performance of the enterprise by excellent management techniques or deployment of IT systems for facilitating effective operations management.
- **Performance Improvement in business Effectiveness -** Deployment of continuous improvement in operational activities.

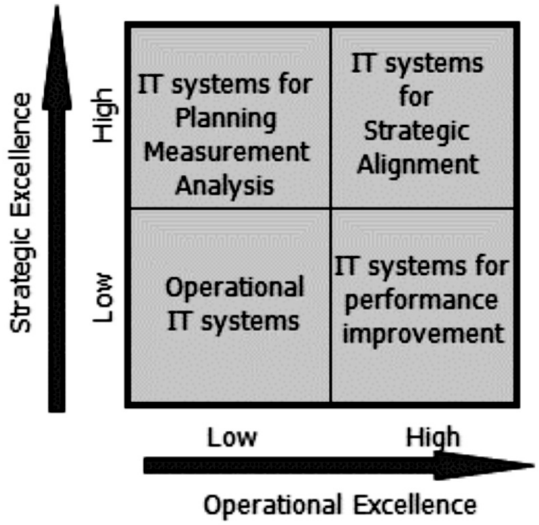

Figure 3: IT Deployment Model
Source: author

The next step involved understanding the business requirement of the Indian Power generation companies, which is a combination of strategic requirement and operational requirement.

Strategic requirements are derived by having an understanding of the industry drivers, industry structure and the strategic focus of the power generation systems. Some of the factors driving the Indian Generation sector are rapid growth and expansion, growth rate, complex projects with multiple partners, major gap between demand and supply etc. Industry structure is analyzed by Porter's five forces model and Strategic focus involves focus on business process design, organizational structure and processes, sustainability through environmental management practices etc. Operational IT requirement of Indian Power Generation are asset management, capacity management, manpower deployment and management of quality of operations.

Using this understanding, finally the IT deployment model is formulated. This model intended to address the following questions

- Deployment Strategy – What IT systems should be deployed for achieving different business objectives

- Deployment Approach – How the IT systems should be deployed in terms of coverage, processes and approach.
- Deployment Phasing – When the different IT systems should be deployed in terms of what should come first and what next.

The following are the IT systems which will impact the strategy of the organization:

- Power Corporations focusing on Strategic Alignment need to focus on activities such as Redesigning the organizational functions and tasks, Managing effective capacity Utilization, Ensuring right engineering, Business focus, Productivity Improvement.
- Operations focusing utilities must focus on activities such as effective deployment of man power, Knowledge Management, Operations Practices Enhancement, Capital Budgeting, management Information Systems, Plant Operations etc.
- The focus of Performance Improvement Systems are looked from the Key Process Indicator s (KPI) of financial, operational, Customer and employment concern and employee and Training Perspective (Kaplan & Norton). Accordingly, the corporations can have measures such as operational expenses, maintenance cost, fuel cost, Percentage increase in production capacity, Percentage increase in capacity utilization, number of regular penalties, number of injury accidents, number of employee benefits available.
- Planning, Measurement and Analysis systems include having MIS system in place, integrated MIS Policy, MIS interface with digital control system, management of regulatory requirements etc.

The following are the limitations of the Research:

- When developing the framework, several important external factors influencing the IT investments such as policy changes in the government, initiatives by external stakeholders were identified.. These factors were not considered.
- The weights agreed on for measures of IT business-value may change when the IT adoption changes
- As indicated by Clemons,1991, user adoption, future benefits and competitive impact are difficult to forecast based on the information technology usage.
- Even though IT investments are happening from the inception of KPCL, the data on business performance over select period has been taken for analysis to find out the trends over a period of time. However, similar approach have been used by researchers of the IT impact study.

Scope for further research

The power sector unlike many other sectors has very strong operational linkages between the upstream and downstream players in terms of potential to influence the performance of other entities in the value chain. The transmission company operations have strong operational linkages to influence the operational performance of the generation company as well as the distribution company. Similarly the performance of the generation company and the distribution company has strong potential to impact the other two entities. This linkage is reflected in the IT investments as well. For example the IT systems for managing the load and maintenance schedules of a power generation company will be more effective if it has linkages with the IT systems of transmission and generation companies to understand the demand and load patterns. Hence, the research highlights how each of the research outputs can be used in these companies and makes the IT investment impact the business operations of power transmission and distribution companies.

Conclusion

The major contribution of the research is the formulation of a methodology that would facilitate to measure the impact of IT on business performance. It also provides a practical management tool to address the question of assessing the business performance in a power sector using IT. The research highlights certain key issues that require managerial attention for subsequent action. Finally, it provides an IT deployment model for future investments in power generation.

To conclude, this study has endeavored to contribute to the growth of knowledge by understanding the IT systems in Power generation organizations and

developed an IT deployment model for further research. The main objective of the research was to understand the IT systems in KPCL, which involved developing a framework for measuring the IT systems and propose areas for improvement. The impact model developed for Power Generation sector is comprehensive, accurate and holistic, which will address the IT usage and IT investment questions and gives value-proposition to Power generation systems.

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Manage with Vision of Life

- M.N. Venkatachaliah*

INTRODUCTION

On this significant moment in your lives I convey to the out-going graduates my affectionate greetings and congratulations on the achievement they have accomplished. May your lives be blessed with prosperity and inspired by high ambitions. It is well to remember that as you plod through the wilderness of life's experiences you may have occasions that may compel you to surrender to agnosticism and to worship doubt. You should remember that the race is not always for the swift and the battle not always for the strong. Time and chance happeneth to all.

But remember that steadfast adherence to what you consider your values and ideals will always stand you in good stead. It is wise to remember Blaise Pascal's wager; If you believe in God and He turns out to exist, then you have obviously made a good decision. The skills you have acquired will bestow upon you great opportunities. In the pursuit of wealth, happiness and success, in the way these ideas are understood and practice today, you will inevitably face ethical dilemmas. But remember always that leadership goes with severe sacrifices. If you do not have an impersonal love for mankind you cannot be leaders of men. I wish you courage more than any other virtue – courage to be virtuous.

CHANGING CONTEXT OF THE ART AND SCIENCE OF MANAGEMENT

A scholar of management sciences uttered these words about the way ideas of management have been etched in stone and petrified in time. Gary Hamel in the "Future of Management" expressed some profound sentiments as to the future of management. I quote a passage from it which I think you have already familiar with:

"On Christmas eve, 1968, the Apollo 8 command module became the first human-made object to orbit the moon. During its journey back to earth, a ground controller's son asked his dad, "Who's flying in the space-craft?" When the question was relayed up to the homebound crew, astronaut Bill Anders replied, "I think Sir Isaac Newton is doing most of the driving now".

"Like that curious lad, I'd like to pose a question: Who's managing your company? You might be tempted to answer, "the CEO," or "the executive team", or "all of us in middle management". And you'd be right, but that wouldn't be the whole truth. To a large extent, your company is being managed right now by a small coterie of long-departed theorists and practioners who invented the rules and conventions of "modern" management back in the early years of the 20th century. They are the poltergeists who inhabit the musty machinery of management. It is their edicts, echoing across the decades that invisibly shape the way your company allocates resources, sets budgets, distributes power, rewards people, and makes decisions".

"So pervasive is the influence of these patriarchs that the technology of management varies only slightly from firm to firm. Most companies have a

**This is abridged version of the Convocation address delivered by the author to the Graduating students of M.P.Birla Institute of Management:Associate,Bharatiya Vidya Bhavan, Bengaluru 560 001 on 13th September 2014.*

roughly similar management hierarchy (a cascade of EVP's SVP's and VP's). They have analogous control systems, HR practices, and the planning rituals, and rely on comparable reporting structures and review systems. That's why it's so easy for a CEO to jump from one company to another – the levers and dials of management are more or less the same in every corporate cockpit".

"Yet unlike the laws of physics, the laws of management are neither foreordained nor eternal – and a good thing, too, for the equipment of management is now groaning under the strain of a load it was never meant to carry. Whiplash change, fleeting advantages, technological disruptions seditious competitors, fractured markets, omnipotent customers, rebellious – shareholders – these 21st century challenges are testing the design limits of organizations around the world and are exposing the limitations of a management model that has failed to keep pace with the times".

"Think about the great product breakthrough over the last decade or two that have changed the way we live; the personal computer, the mobile phone, digital music, e-mail, and online communities. Now try to think of a breakthrough in the practice of management that has had a similar impact in the realm of business – anything that has dramatically changed the way large companies are run. Not easy, is it? And therein lies the problem".

"Management is of out of date. Like the combustion engine, it's a technology that has largely stopped evolving, and that's not good. Why? Because management – the capacity to marshal resources, lay out plans, program work, and spur effort – is central to the accomplishment of human purpose. When it's less effective than it could be, or needs to be, we all pay a price".

Today, more than ever before in our civilization, the science and art of management has assumed critical importance. What you learn as a science you practice as an Art. The rewards of an art are in its practice. Time and chance have changed many institutions. E-mail and Internet, for example, have changed the way of business. "The E-mail to is to information revolution what the Rail-road was to the Industrial Revolution". Just see what social media on the Internet has done to the newspaper industry; the circulations of leading newspapers in UK have come down over the decade between 2000 and 2012. Daily Mirror, The Guardian, Sunday Mail, Telegraph lost 40% to 50% of circulation. More than all, there is one over-arching social factor that has imperceptibly changed our notions of what is good and moral. In India, a tyrannical feudal social order has collapsed. It has not happened because a bearded leader order it. It has happened because its time had come. With it are gone the conservative morality, which were components of the feudal machine, so much so, the present generation finds itself nothing to go by. In a society which is increasingly becoming a - moral is left to fend for itself. We can see a parallel with what happened in China during its 'Cultural Revolution'.

Western industrial and economic philosophy has as its twin foundational ideas, the concept of dynamic disequilibrium and creative destruction. It is said that while the 20th Century was the Century of America, the 21st is the Century of China and India. In reality the 21st Century is Century of new-medicine. It is also the Century of the science and art of management. There is a crisis of management of science in India. India in the area of availability of Scientists is ranked 3rd in the World. It is 4th and 5th in the world in domestic – market and foreign - market access. The Global Competitiveness Report ranks India at the 50th place in over-all global competitiveness. India is weakened by its Macro-economic instability. Government runs one of the highest deficits in the world and has high unsustainable levels of Government debt. In human – development we are behind Cuba and even Congo. Our ranking in H.D .I has gone down from 128 to 137. An oxford UNDP – study indicates that there are more poorest of the poor in eight states in India than 23 African Nations put together.

Technology has changed the world. It has eliminated distance and brought the world closer. It is no more a conflict of philosophical perceptions such as 'Business and Anti-Business' or 'Smithians' and 'Anti-Smithians'. Both are alive and well. But what has changed is the ability to match personal ethics with corporate ethics. The economic-melt downs the world has seen from time

to time is a mere euphemism for collapse of character and faith. It has occurred earlier in industrialized countries. In that sense historic time is not linear but cyclic.

We have seen this enacted earlier in America in the twenties and early thirties of the last Century as well. Though it was 'largely a country of villages and towns of wide-lawns and airy houses, of hard-work, puritan values and self-sufficiency much of the wealth displayed was based on speculation'. Yet another symbol was the 'country-club' and of 'bath-tub' Gin, New-Jazz, the flapper and the beginning of the revolution in sex. Upton Sinclair's description of the hard-life and cruelty of the factories was largely ignored. Then America had it. As an eminent lawyer describes:

In November 1929 the bubble burst. The collapse of stock market prices measured the collapse of the entire economic structure. In the summer of 1929 the Dow Jones average for Industrial stocks had been 381.17. In the summer of 1932 it was 41.22. Ninety percent of the value had disappeared. The plight of the former was worse. Corns Sold for seven cents a bushel, sugar for three cents per pound. Twenty-five percent of the land in Mississippi was sold at auction on the foreclosure of mortgages.

The plight of industry was no better. In the three-year period of December 31, 1933, the Gross National product fell from 194.42 to 56. Bankruptcy liquidation and reorganization were a chief business of the legal profession. The average wage of factory workers was forty cents per hour. Factory payrolls were cut in half. One of every four men available for work was un - employed. There were no labor unions, no unemployment compensation, and no Social Security.

How you were affected dependent on who you were. If you were the son of a relatively well –to- do family, the father of one of your friends may have jumped from twentieth - story window. Another friend would not return to your boarding school or college in the fall. If you were of the middle class, you might sink down to the bottom. In one group of laborers were found clergymen, engineers, a school principal, and a bank president. For factory workers the depression meant unemployment, bread lines and soup kitchens. Municipal Bankruptcies were common. The young hit the road. One young hobo was Eric Severed, a banker's son, whose face and voice would become familiar to millions on CBS News programs. The estimates of the number of youths who lived as trumps run up to two million.

You managers of business and industry have in your hands the ability to avoid such grim situations for the future of mankind. For you, gentleman- the outgoing graduates – the whole world is before you. With the technological breaks- through the sky is the limit for growth.

ECONOMIC DEVELOPMENT : TWO VIEWS AND APPROACHES

Is a country considered poor in economic terms necessarily a undeveloped one? Responses to this poser may vary. Hodson in his "Diseconomics" said' India might be poor, but to say it is undeveloped is a travesty of that word. India, he said, was a developed country when parts of the northern hemisphere consisted of bogs and were inhabited by uncivilized men! There are non-economic dimensions of development. Enhancement of quality of life is one. Amartya Sen would say that expansion of freedoms is both the primary end and the principal means of development. The lessons of development are that economic growth does not trickle down. Macro-economic stability is essential and human needs must be met by specific state-intervention. No one policy will alone trigger development but needs a comprehensive approach with the support of institutional arrangements. 'Social-preparedness' is a pre-cursor of the results of economic reforms. Public goods such as education, health, human security are not rewards of development; but are essential to the very process of development. Amartya Sen illustrates the point by a comparison between China and India.

"The contrast between India and China has some illustrative importance in this context. While Indian efforts have slowly met with some success, the kind of massive results that China has seen has failed to occur in India. An important factor in this contrast lies in the fact that from the standpoint of social

preparedness, China is a great deal ahead of India in being able to make use of the market economy. While pre-reform China was not skeptical of markets it was not skeptical about basic education and widely shared health care. When China turned to marketisation in 1979 it already had a highly literate people especially the young, with good schooling facilities across the country. In this respect China was not very far from the basic educational situation in South Korea or Taiwan, where too an educated population had played a major role in seizing the economic opportunities offered by a supportive market system. In contrast India had a half-illiterate adult population when it turned to marketisation in 1991 and the situation is not much improved today" (development as Freedom).

The international economic order based on market economy has its own inequities. It is fierce in its competitive ruthlessness, Joseph Stiglitz spoke about them in his 'Roaring Nineties' and 'Globalization and its Discontents'. A stress on mere growth without justice and equity can make it ' Ruthless, Rootless, Voiceless, Jobless and Futureless.

Amartya Sen speaks of two different attitudes to the process of development . One view sees development as a "fierce " process, with much " blood, sweat and tears" – a world in which wisdom demands toughness. In particular it demands calculated neglect of various concerns that are seen as ' soft headed'.

"This hard- knocks attitude contrasts with an alternative out-look that sees development as essentially a "friendly" process. Depending on the particular version of this attitude, the congeniality of the process is seen as exemplified by such things as mutually beneficial exchanges (of which Adam Smith spoke eloquently) or by the working of social safety nets, o of political liberties or of social development or some combination or other of these supportive activities."

This social security is an important counter-part of the agenda of development. Market - economy supports growth; but at the same time produces unacceptable levels of inequality. If the negative forces generated by inequality are not to damage economic activity. It is necessary to look at social security issues as a essential and inevitable concomitant of the economic process.

VISION OF THE STUNNING 21ST CENTURY

Jeffry Sach's observed: "World is no longer divided by ideology. It is divided by technology. Only 15% of world is technologically innovative; 50% of the world is capable of adopting these innovations, 35% of the world is technologically disconnected".

Scientists are already envisaging an era where all important decision making will be done by computerS which develop super- human intelligence. That is the coming age of technological singularity. That is because the moment when technological change becomes so rapid and profound, if represent a rupture in the fabric of human history.

Raymond Kruzweil in his 'Fantastic Voyage' predicts :

"As we peer even further in to the 21st century, nanotechnology will enable us to rebuild and extend our bodies and create virtually any product form mere information, resulting in remarkable gain in prosperity. We will develop means to vastly expand our physical and mental capabilities by directly interfacing our biological systems with human created technology"

"Because of this exponential growth, the 21st century will equal 20000 years of progress at today's rate of progress 1000 times greater than what we witnessed in the 20th Century, which itself was not slouch for change"

The present system of measurement of economic performance itself has become controversial. The gap between official figures and public perception is ever increasing. In France and UK only one-third of citizens trust official figures and these countries are not exceptions. The traditional concept of GDP does not capture the more important dimensions of social progress. Time has come to adapt the present system of measurement of economic activity so as to better reflect social progress.

EPILOGUE

At times of great changes human intellect unless controlled by values, can tend to be a self - stultifying instrument. Increase in knowledge without a corresponding growth in wisdom, can be a source

of disaster. Disaster can ride on a sun beam of knowledge. Businessmen and corporate often speak of pragmatism as a practical philosophy. Simply put, it seeks to do away with bondages of dogmas, unbending beliefs and traditions. ' We have to be practical '. This is the single mean that runs across the world of business. 'customer satisfaction ' and 'share holder value' are the twin shibboleths of the business world.

Bishop Wilson asked us that we should go by our best light ; but cautioned that darkness be not our light and evil our good. But, in understanding what is virtue and what is goodness inevitably we fall back on our own unfailing resource : 'Dharma' : the much misunderstood word. What does it convey. An eminent member of your own tribe Guru Charan Das in his book " Difficulty of being good " tells us : "

"Dharma , the word at the heart of the epic, (The Maha Bharatha) is in fact untranslatable. Duty, goodness, justice, law and customs all have something to do with it, but they all fall short. Dharma refers to 'balance' - both moral balance and cosmic balance. It is the order and balance within each human being which is also reflected in the order of the cosmos".

Lord Buddha late in his life standing on a hill top looked at the beautiful world below and in an expression of the freshness of emotion said; "Chitram Jamboo-dweepam; manoharam jeevitam manushvanam". On this beautiful day of frost and sun we shall therefore not go to bed before evening.

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Multi-dimensional Perspective of e-HRM: A Diagnostic Study of Select Auto-component Firms

- Geetha R.*

Abstract

Electronic Human Resource Management has brought about a paradigm shift in the way operational, relational and transformational functions of HRM are performed. Most of the companies across the globe have digitized their HR practices of recruitment, selection, training, performance management, compensation management, leave and attendance management, time management and other operative and strategic functions either through adoption of integrated software applications like SAP or Oracle People soft, or through adoption of standalone applications like Applicant Tracking System, Recrumax, Learning Management System, Payroll, Performance Management Suite and so on. Through this study an effort was made to analyze the effectiveness of e-HRM in auto-component industry from multi- dimensional perspective. e-recruitment, e-selection, e-learning, e-performance management and e-compensation management are the five core dimensions of e-HRM considered for the study. A research premise was developed and tested based on the opinion survey of around 110 HR practitioners at Senior and middle levels of management from 44 select auto-component firms. The findings explicate that technology integration with HR practices in auto-component industry is yielding significant benefits to the firms in the form of reduced cost per hire, increased applicant volume, and enhanced quality, simplified processes, reduced cycle-time of HR and many others which are discussed in detail in this paper.

Key Words: e-HRM, Technology integration, multi-dimensions of e-HRM, Efficiency gains.

INTRODUCTION: Multidimensional Perspective Of E-HRM

The possibilities of integrating digital technological applications with HRM are endless. Electronic technology can be integrated with almost all the processes of HR. The effectiveness of electronic technological applications in HR processes and the value they generate to organizational performance enhancement can be better assessed by analyzing in isolation, the contribution of each of its dimensions to organizational performance. The various dimensions or aspects of e-HRM include: e-recruitment, e-selection, e-learning, e-performance management, e-compensation management, e-leave management, e-time management, e-surveillance, e-attendance

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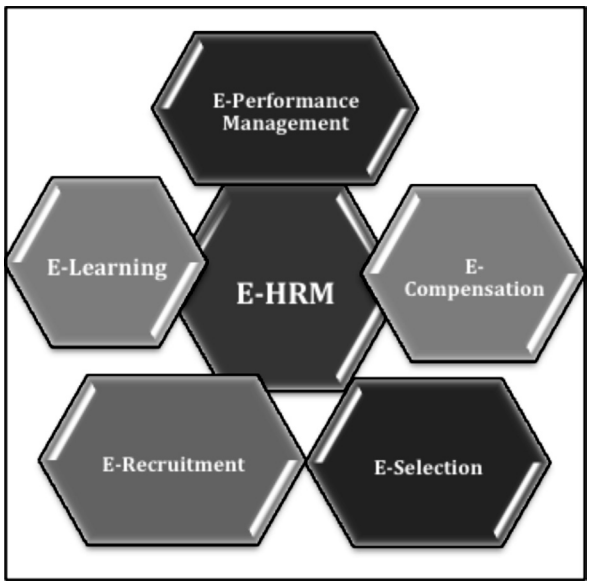
management, etc. Electronic or web-based technology can be leveraged to deliver HR solutions that bring about convergence in HR processes of recruitment, selection, training, evaluation, compensation and all other activities of HR which facilitate the implementation of business strategies. In subsequent paragraphs five dimensions of E-HRM are discussed separately.



Source: Author

A) e-Recruitment:

Organizations across the globe have started using e-recruitment sources so as to attract and retain highly talented employees.

E-recruitment may be defined as the extensive use of electronic technology or web-based technological tools to assist the recruitment process of an organization.

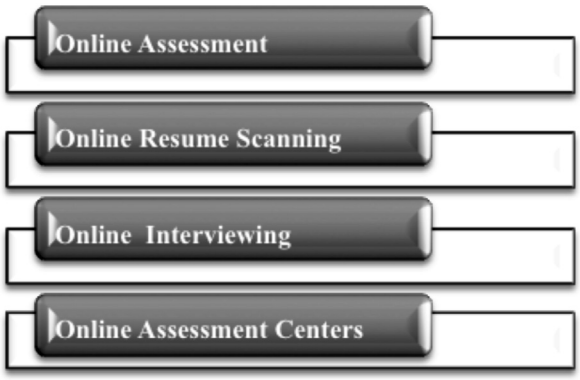
Sources of E-Recruitment

Source: Author

B) e-Selection

E-Selection is a paperless process through which the applicants or job seekers can be selected to jobs through quick dissemination of electronic documents and information nationwide and worldwide using internet.

e-Selection Techniques



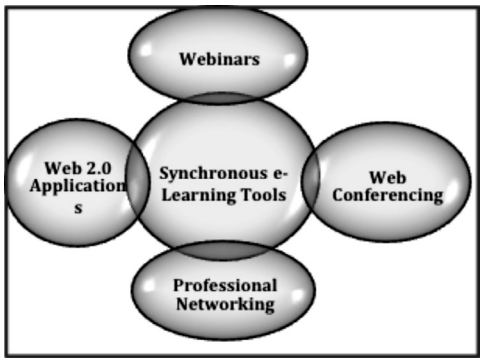
Source: Author

The criteria used in the research for assessing the effectiveness of e-selection are –applicant screening cost, selection cost, and cycle time reduction, number of recruits satisfying job requirements, Standardization and process consistency.

C) e-Learning

E-Learning is the use of technology to enable people to learn anytime and anywhere. E-Learning can include training the delivery of just-in-time information and guidance from experts. E-learning will facilitate to overcome the barriers of time, distance and resources.

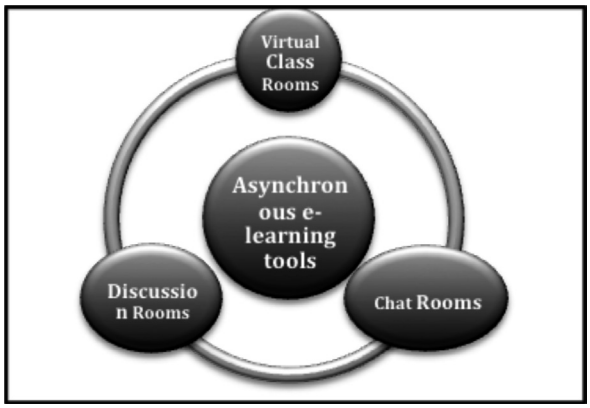
e-Learning Techniques



Source: Author

Synchronous e-learning techniques include: webinars, web conferencing both audio and video, professional networking, instant messaging and other web 2.0 applications.

Asynchronous e-learning includes self-paced learning modules, virtual class rooms and chat rooms and discussion groups. Apart from synchronous and asynchronous e-learning techniques, there are also built-in learning and knowledge management systems within organizations to facilitate e-learning for employees and executives.



Source: Author

Effectiveness of e-learning for the study purpose is assessed using variables like Travel expenses, time saved ,job relevance of learning content, task time and time spent on learning and employee productivity.

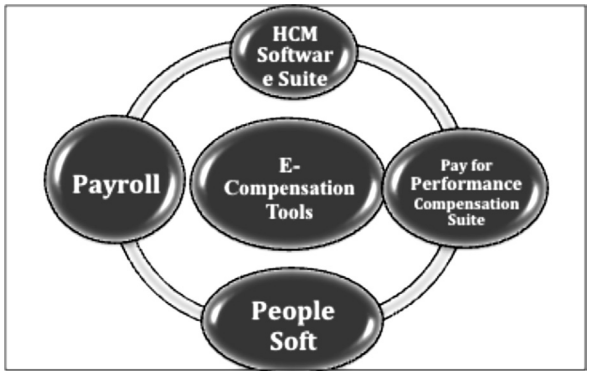
D) e-Compensation Techniques

E-Compensation is the integration of electronic software tools for modeling the Salary structure, Cash & Non-Cash plans that strategically drive performance. Managers are also able to provide total compensation reporting to their employees which will act as a valuable retention tool.

E-Compensation improves the efficiency and accuracy with which managers address compensation issues. Managers gain easy online access to total workforce compensation information, as well as third-party benchmarking and salary surveys that they can then use to request or perform salary changes.

1. E-Compensation Alerts notify HR managers when a Compensation Cycle is available for their group. When complete, changes are submitted and routed for approval.
2. Automated Salary proration and eligibility rules further eliminate manual intervention.
3. Facilitates viewing total compensation-related information for direct reports from a central location, including salary, cash components, and non-cash items.
4. Request or grant base salary increases for employees, which are automatically routed for approval, either during targeted review periods or on an ad-hoc basis.
5. Easily sets up workflow to automate approval routing.

   E-compensation effectiveness was estimated by seeking opinion on parameters like error count, time taken, statutory compliances, simplification of processes, effectiveness of job evaluation, and changes in time and ambiguity avoidance.



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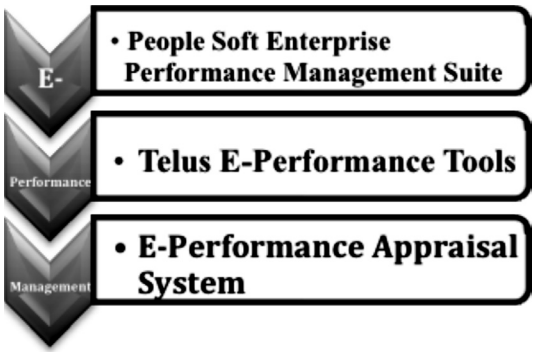
E) e-Performance Management

Performance is the accomplishment of a given task measured against preset standards of accuracy, completeness, cost, and speed. Performance enhancement due to HRMS in the firms was evaluated based on the estimation of speed, accuracy and cost of performing the HR functions. E-performance management may be defined as a system in which electronic technology is integrated with the performance management process of the organization in order to improve organizational, team and individual performance.

In the context of the research, the constructs used to assess e-performance management dimension are, accuracy, change in time, elimination of rater's bias and rating errors and ease of training needs assessment and determination of rewards with performance results. An effort was made to find the implications of e-performance management on all the mentioned factors.

e-Performance Management Tools



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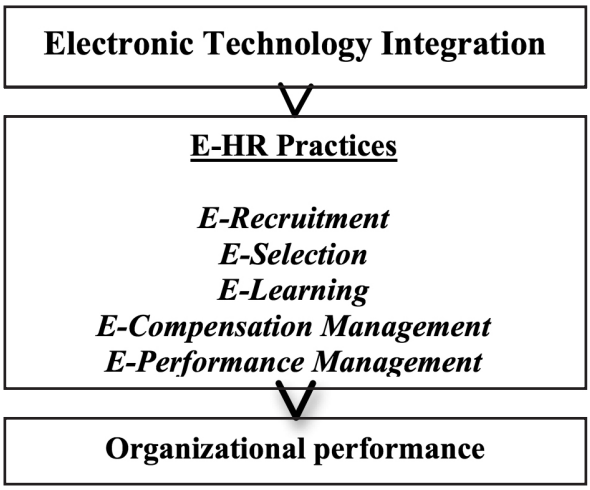
OBJECTIVES OF THE RESEARCH

Though there are several empirical studies related to the role of HRIS in organizations, concrete efforts to measure the implications of electronic technology integration with HR practices on Organizational effectiveness in automotive component industry have not been made so far. Current research work is undertaken in order to realize the following objectives:

1. To examine the implications of e-HRM on HR operational costs.
2. To evaluate e-HRM as a strategic tool for quality enhancement.
3. To appraise the effectiveness of digitized personnel management practices on process simplification.
4. To assess efficiency gains due to HR automation.

RESEARCH PREMISE

Many auto component firms have accepted and integrated electronic technology in their functional, operative and tactical processes. They have incurred massive expenses on technology incorporation with all HR processes. Through this research an effort was made to examine the implications of e-HRM on organizational performance.



Source: Author

RESEARCH HYPOTHESES

Ha1: Cetirus Paribus, e-HR Practices lead to Simplification of HR activities.

Ha2: Digitized HR practices have resulted in personnel cost efficiency.

Ha3: Automation of HR practices has enhanced the quality of all HR processes.

Ha4: Effective time management is a significant outcome of e-HRM.

DATA ANALYSIS AND INTERPRETATION

This section presents the results of the study after examining and analyzing the relationship between dependent and independent variables considered for the study. Appropriate mathematical and statistical tools were employed to test the hypotheses that were formulated to assess the effectiveness of e-HRM on organizational performance in auto-component industry. The analysis was carried out using SPSS (20th Version) software application.

Twenty one statements used in the questionnaire were assessed on a five point Likert rating scale ranging from strongly disagree (1) to strongly agree (5). To simplify analysis, 21 variables of assessment were reduced to four factors based on their communality. This was done with the help of factor analysis and the principal

component analysis. The results of the analysis and observations pertaining to EHRM outcomes have been subsequently discussed.

Table 1: Reliability Statistics of Variables used to Assess Effectiveness of e-HRM

e-HRM Effectiveness Variables: Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.933	.929	21

The reliability analysis was conducted as shown in **table 1** by computing the Cronbach's alpha (α) for each moderating variable used to assess the effectiveness of e-HRM. The reliability of a measure indicates the stability and consistency of the instrument used in measuring a concept and it helps to assess the goodness of a measure (Sekaran, 2000). The Cronbach alpha test was conducted to ensure internal consistence and reliability between the moderating variables used to assess the concept.

The Cronbach's alpha for twenty one items or independent variables used to measure the concept of e-HRM was **0.933** with 'α' for each score ranging between **0.925 to 0.935** indicating that the measures have acceptable internal consistency since they are much above Nunnally's (1978) threshold limit of 0.70. The results of the reliability test conducted to validate the questionnaire are shown in **table 1**. The 'α 'based on standardized items need not be considered since all the items used were statements with multi point responses which mostly comprised of the same responses on a five point rating scale with responses given in a descending order (Min.-1 Strongly Disagree and Max. 5- Strongly Agree).

Results of Factor Analysis

Simple iterated factor analysis was carried out by iterating principal axis factors to four factors based on their communality. As a method of extraction, a promax oblique rotation technique was used since it was found that correlation exists between the variables considered for assessment. To determine the number of factors to be extracted, both theory and information was used by running the analysis to extract different numbers of factors and seeking which number of factors yields most interpretable results.

The steps involved in data reduction through factor analysis are indicated below:

Step-I: Pre-checking Sampling adequacy through KMO and Barlette's test of Sphericity.

Table 2: KMO and Barlette's Measure of Sampling adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.789
Bartlett's Test of Sphericity	Approx. Chi-Square	2075.765
	Df	210
	Sig.	.000

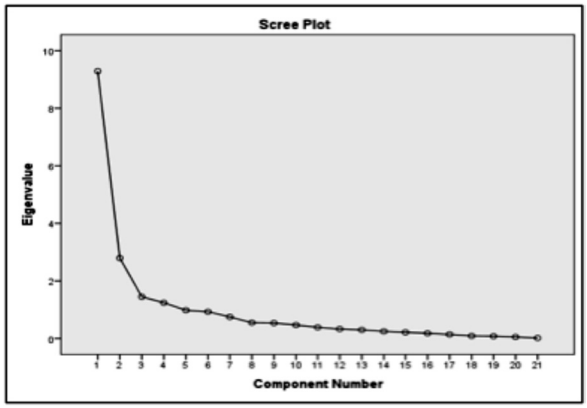
Source: Author

Kaiser-Meyer-Olkin test was conducted to ensure the adequacy of sampling size for factor analysis. As per the decision criteria if it is above 0.6 then the sampling size is adequate. From **table 2**, it can be observed that KMO measure of 0.789 is much above the threshold limit of 0.6 and Barlett's test of Sphericity with sig. value of .000 shows that the sampling adequacy is significant at 99 percent confidence level.

Step-II: Extraction Method, Principal factor axis.

Based on communalities, the proportion of each variable's variances due to underlying latent factors was identified based on the principal factor axis. Based on the factor loadings four factors having Eigen values more than one were identified as depicted in the scree plot in **figure 1**.

Figure 1: Scree Plot depicting component numbers with their Eigen Values



Source: Author

Scree plot in Figure 1 graphically displays the Eigen values for each factor andsuggests that 4 factors are prominent since they have Eigen values more than one.

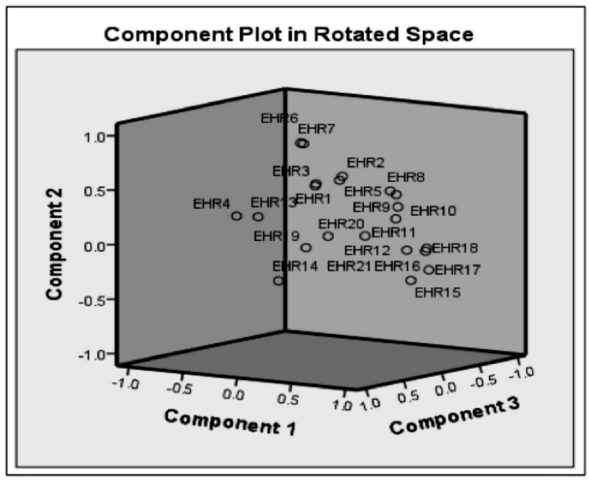
Table 3: e-HRM Components Correlation Matrix

Component Correlation Matrix				
Component	1	2	3	4
1	1.000	.542	.206	.175
2	.542	1.000	.334	.261
3	.206	.334	1.000	.158
	.175	.261	.158	1.000
Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.				

Source: Author

The rotated factor matrix above indicates that a four factor solution is evident in the data above. Items comprising decision related factors, cost related factors, and quality related factors and accessibility factors appear to be grouping relatively based on their communalities. The Eigen values for factors 1, 2, 3 and 4 shown above have Eigen values greater than one and hence they have been extracted as components as shown in table 4 above.

Figure 2: e-HRM Component Plot in Rotated Space



Source: Author

The rotated component matrix in **figure (2)** shows how the factors are loaded around the components extracted through principal component analysis based on their communalities. Most of the factors are highly loaded on to the first component which is decision –oriented.

Table 4: Correlation between e-HRM Factors Extracted Through Factor Analysis and e-HR Practices

Correlations		
		E-HR Practices
Simplicity and Decision-Oriented Factors	Pearson Correlation	.325**
	Sig. (1-tailed)	.000
	N	110
Cost and Standardization -Oriented Factors	Pearson Correlation	.396**
	Sig. (1-tailed)	.000
	N	110
Accessibility and Savings related Factors	Pearson Correlation	.316**
	Sig. (1-tailed)	.000
	N	110
Quality and other Value Adding Factors	Pearson Correlation	.268**
	Sig. (1-tailed)	.002
	N	110
**.Correlation is significant at the 0.01 level (1-tailed).		

Source: Author

From **Table 4** we can observe that e-HR practices are highly correlated with the components extracted through principal component analysis. The correlation is significant at 99 percent confidence level.

Pearson's correlation coefficient of 0.325 at 0.01 significance level substantiates that e-HR practices will facilitate to make quick and effective decisions. Similarly the Pearson's coefficient of 0.396 (at alpha =0.01) indicates that e-HR practices help organization to reduce cost and standardize HR. Besides this E-HRM facilitates easy accessibility to information, enables saving time and cost, enhances quality and adds a lot of value to organizational performance enhancement.

Table: 5 Extraction of Factors based on communalities

Communalities		
	Initial	Extraction
EHR1: Data Input has Become Simpler	1.000	.621
EHR2: Ensures Flexibility to Employees	1.000	.592
EHR3: Facilitates Quick Learning	1.000	.742
EHR4: Saves Money	1.000	.813
EHR5: Develops Unique and Specialized Personnel	1.000	.673
EHR6: Has Positive Impact on employee Motivation	1.000	.721
EHR7: Facilitates Employee Engagement	1.000	.781
EHR8: Improves Employee Orientation	1.000	.786
EHR9: Improves Training and Development Process	1.000	.806
EHR10: Leads to Effective Career Planning	1.000	.754
EHR11: Personnel Management Becomes Simpler	1.000	.719
EHR12:Improves Occupational Health and Safety Process	1.000	.688
EHR13: Enables Easy Access to Knowledge and Information	1.000	.593
EHR14: Saves Cycle Time of all HR Activities	1.000	.684
EHR15: Ensures Quick Decision Making	1.000	.705
EHR16: Facilitates Identification of Training and Development Needs of Workforce	1.000	.774
EHR17: Facilitates Effective Decision Making	1.000	.766
EHR18: Useful for Effective Promotion Decisions	1.000	.772
EHR19: Reduces Paper Work	1.000	.662
EHR20: Enhances Quality of Workforce	1.000	.565
EHR21: Ensures Effective Auditability of all HR Activities	1.000	.552
Extraction Method: Principal Component Analysis.		

Source: Author

The four factors shown in **table 5** have been extracted based on their communalities.

Extraction - The values in table 5 indicate the proportion of each variable's variance that can be explained by the retained

Factors. Variables with high values are well represented in the common factor space, while variables with low values are not well represented.

Hypothesis 1

Ha1: Cetirus Paribus, E-HR practices lead to simplification of HR activities.

Table 6 (a) Model Summary of Dependent Variable: Simplicity and Decision-Oriented Factors

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325[a]	.106	.098	.816
a. Predictors: (Constant), E-HR Practices				

Source: Author

Table 6 (b): Coefficients of Dependent Variable: Simplicity and Decision-Oriented Factors

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.652	.356		7.452	.000
	E-HR Practices	.253	.071	.325	3.576	.001
a. Dependent Variable: Simplicity and Decision-Oriented Factors						

Source: Author

The results of the regression analysis in Table **6 (a & b)** supports the hypothesis 1stated above and hence it is accepted. The standard beta coefficient is 0.325. The significance level is 0.01 for the independent variable E-HR practices indicating that adoption of e-HR practices has enhanced the decision making capabilities in HRM and has simplified HR processes in auto-component firms. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by (P<0.01).

Hypothesis: 2

H_a2: Digitized HR practices have resulted in personnel cost efficiency and standardization.

Table 7 (a): Dependent Variable: Cost and Standardization - Oriented Factors

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.396[a]	.157	.149	.634
a. Predictors: (Constant), E-HR Practices				

Source: Author

Table 7 (b): Coefficients of E-HR Cost and Standardization -Oriented Factors

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.796	.277		10.108	.000
	E-HR Practices	.247	.055	.396	4.484	.000
a. Dependent Variable: Cost reduction and Standardization -Oriented Factors						

Source: Author

The results of the regression analysis in Table **7 (a & b)** supports the hypothesis 2 stated above and hence it is accepted. The standard beta coefficient is .396. The significance level is 0.000 for the independent variable E-HR practices indicating that adoption of e-HR practices has significantly facilitated standardization of HR practices and has also contributed immensely to the reduction of various HR costs. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by (P<0.01)

Hypothesis 3

Ha3: Automation of HR practices has enhanced the quality of all HR processes.

Table 8 (a): Dependent Variable: Quality and other Value Adding Factors

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.268[a]	.072	.063	.506
a. Predictors: (Constant), E-HR Practices				

Source: Author

Table8 (b): Coefficients of Quality and other Value Adding Factors

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.601	.221		16.317	.000
	E-HR Practices	.127	.044	.268	2.897	.005
a. Dependent Variable: Quality and other Value Adding Factors						

Source: Author

The results of the regression analysis in **Table 8 (a & b)** supports the hypothesis 3 stated above and hence it is accepted.

The standard beta coefficient is .268. The significance level is 0.05 for the independent variable e-HR practices indicating that adoption of e-HR practices has significantly enhanced the quality of workforce as well as that of HR activities like compensation management, performance management, learning, recruitment and selection. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by (P<0.01).

Hypothesis 4

Ha4: Effective time management is a significant outcome of EHRM.

Table 9 (a): Dependent Variable: Accuracy and time savings related Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.323[a]	.105	.096	.612

Source: Author

Table 9 (b): Coefficients of Accuracy and Time saving related Factors

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.440	.235		14.641	.000
	E-HR Practices	.148	.042	.323	3.552	.001
a. Dependent Variable: Accuracy and Time -Savings related Factors						

Source: Author

The results of the regression analysis in Table **9 (a & b)** supports the hypothesis 4 stated above and hence it is accepted. The standard beta coefficient is .323. The significance level is 0.01 for the independent variable e-HR practices indicating that adoption of e-HR practices has significantly increased speed and accuracy besides saving the cycle time of all HR activities. The positive relation between the dependent and independent variable is significant at 99 percent confidence level as indicated by ($P<0.01$).

FINDINGS AND OBSERVATIONS

1. More than 92 percent of the firms considered for research had more than 4 e-HR practices.
2. E-HR practices have made data entry simpler and ensure flexibility in choice of benefits, leave and attendance management and time management.
3. E-HR practices have facilitated quick learning and development of unique and specialized personnel.
4. The time saved due to E-HR practices is found to be statistically significant.
5. E-HRM is found to have facilitated in employee engagement and better Quality of Work Life (QWL).
6. E-HRM has a positive impact on employee motivation and learning.
7. The use of e-HR practices have enabled easy access to knowledge and information and has enabled effective career planning.
8. The cycle – time of HR practices is found to have been reduced consequent upon the use of e-HR applications.
9. Decision making has become quicker and simpler in the organizations surveyed due to the use of Human Resource Information System and Decision Support Systems.
10. HR practitioners of the firms surveyed have observed that e-HR applications have enhanced the quality of their workforce.
11. It was also observed through study that the auditability of all HR activities has become easy as a result of e-HR applications.
12. E-HR applications are found to be susceptible to data security threats like data compromise, data loss and data thefts.
13. Some of the small and medium firms were frequently bothered by technical snarls and hence they were maintaining both manual HR records and electronic version of it.
14. Smaller firms could not afford to purchase integrated HR –packages due to high cost. They were mostly using simple standalone applications.
15. Some of the HR practitioners did not have clarity on the auditability of e-HR practices.

Suggestions and Recommendations

Some suggestions are enlisted below in order to overcome the inadequacies and lapses identified during research.

- Recruitment through Social Networking Sites (SNS) and other online resources should be increased to leverage from online e-recruitment resources.
- Web 2.0 technologies are not used as a source of recruitment in auto-component industry. The firms may avail of it to access larger pool of talented job-seekers.
- Many of the firms are resorting to RPO (Recruitment Process Outsourcing) since they are able to cut cost of recruitment as consultancy firms are making use of ATS, Recrumax and such other recruitment software applications. Auto-component firms can reduce their recruitment costs to a greater extent in the long run if they invest on purchase of such applications rather than outsourcing recruitment.
- By investing on e-recruitment,tools firms can reduce the cycle-time further.
- The recruitment expenses of larger firms are found to be less due to economies of scale and scope. Hence large firms in auto-component industry which are not making use of e-recruitment may adopt it and avail of it.
- The selection process of auto-component firms is partially automated there are many advanced selection tools like online interview tools, Recrumax,

e-selection suite and several others which will reduce the cost and cycle time of selection if utilized effectively. Firms should incorporate such applications.

- E-learning tools used are mostly basic in nature and hence auto-component firms may use advanced learning tools like authoring tools and LMS tools to attain higher benefits of e-learning.
- Most of the auto-component firms are using basic and stand-alone front-end applications in HR, they should try to use integrated packages like Oracle People soft, SAP_PM Suite and other integrated applications to reap maximum benefits of e-HRM
- Security threats are serious issues to be addressed in e-HRM. Auto-component firms should ensure that they adopt adequate security measures to avoid data thefts and data losses of any kind.
- They may also appoint a Data Base Administrator to take care of e-HR data management and HRIS security issues.
- The HR workforce may be given adequate training about the importance of streamlining e-HR practices as they would greatly contribute to organizational performance enhancement.
- The HR practitioners should be sensitized about the security threats and issues involved in e-HR data transfers and about the measures to be adopted to prevent and overcome them.
- Around 8 percent of the firms visited were not employing any e-HR practices. They are still conventional in their approach. Such firms may adopt e-HR to manage their workforce more efficiently.
- A significant correlation is observed between e-HR process consistency and auditability; hence the firms can improve their HR auditability through e-HR practices.
- Smaller firms may adopt e-HR practices to quicken their pace of HR activities.
- Auto-component firms may use online-interviewing to reduce the cycle time and cost of selection.
- Training should be imparted to employees who are resistant and not comfortable with e-HR practices.
- The duration of e-learning should be increased to generate full benefit of it.

CONCLUSION

e-HRM practices can lead to innumerable efficiency gains if they are utilized effectively. Though it is in the nascent phase in the auto-component industry, still the firms are able to attain efficiency gains in terms of reduced cost, saved time, and simplified processes, maintenance of consistence, standardization, increased auditability of recruitment practices and a few others like increased average applicant volume per vacancy. Most of the firms considered for survey were found to be more focused on reducing production cost through automation of production process rather than automation of HR practices. That is the reason why auto-component firms have not been able to fully realize the benefits of e-recruitment sources. The efficiency gains that they have attained now can only be rated as partial compared to other sectors of the economy like Information Technology, BPOs and KPOs. Hence it is highly recommended that the auto-component firms should make best use of online recruitment resources to attract a talented pool of employees in order to attain greater efficiency gains.

E-HRM has made remarkable strides in auto-component industry. Though the firms are employing very basic tools and application of e-HRM, they are able to enhance their performance by means of reduced task-time and cost, quickened pace of learning, employee motivation and employee engagement, quick decision making, enhanced quality of workforce and several other positive outcomes.

This empirical study provides terse evidence to justify the rationale behind massive investments on e-learning. If the firms under study have derived noteworthy benefits through simple and basic e-HR applications in addition to their conventional HR practices, then they'll surely be able to derive mindboggling benefits by investing on advanced e-HR applications to build the task-oriented skills and competencies of their employees as that would help them in further augmenting their business performance.

SCOPE FOR FUTURE RESEARCH

e-HRM is a contemporary concept and has adequate

scope for further research. There are several sub-systems under e-HRM like, HRIS, e-surveillance, e-time management, ESS, MSS and several others which have not been covered under the scope of this research. Future researchers may take up any one of the sub-systems of e-HRM and appraise its effectiveness or they may work on customizing and developing a new sub-system to integrate with the existing system of e-HRM. Also they can appraise the effectiveness of e-HRM in some other sector of the economy or some other industry.

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International Trade & Business Model with Special Reference to Operating System Software Products

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Abstract

Business model essentially deals with value creation and distribution of product or service. Value creation and distribution of operating system products seems to be a complex set of activities. This could be due to the process of software development process which takes place across borders. This paper makes an attempt to analyses the issues connected with value creation and distribution of operating system software from international trade perspectives. The policies and role of World Trade Organization (WTO) has been discussed in the paper. The research concludes that Information Technology Agreement(ITA) plays a significant role in value creation process for operating system products. Value creation process is expressed through software features. Standardisation of operating system product features are linked with international trade policies due to the global product usage. This also is directly connected with the acceptance of product. Therefore, it is necessary for international trade organisations to have more clarity of the policies related to exchange of system software products.

Keywords: International trade, operating system, software patenting, software licensing & ITA.

International Trade and Business Model:

Business model essentially deals with value creation and distribution of product or service. Operating system products are truly global products. The product is conceived and designed by technical engineers across various countries. The product is exchanged across borders. The product exchange can be complete software or semi-finished software. Therefore, the value creation and distribution activities of system software products are across borders.

The policies of international trade will have an impact on value creation and distribution of system software. Therefore, it is essential to examine the relationship between international trade and business model. There are many countries involved in the exchange of system software. System software is a technology product. The international trade of technology is mostly governed by World Trade Organization(WTO).

World Trade Organization (WTO) is a body established to manage standards and policies for international trade.

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In order to cater to the trade policies for technology, Information technology agreement (ITA) was formed. US, Europe and Japan countries were technology oriented countries post 1990's. They had many agreements related to manufacturing of semiconductor and other computer related technologies. These countries were able to foresee that technology will be one of the drivers of global economy. Hence, they contemplated having technology agreement for easier exchange of technology.

Information technology agreement (ITA) was a significant trade agreement signed by 14 WTO member states. This was the first sectoral agreement to be successfully negotiated between developed and developing countries. It was also the first agreement to fully liberalize trade in a specific sector. After the Uruguay Round, ITA provided participants to completely remove duties on information technology (IT) products covered by the Agreement. There are currently 74 participants – representing 7 per cent of world trade in IT products. (Information Technology Agreement, 1996).

The product categories identified by the ITA are:

- Computers,
- Semiconductors,
- Semiconductor manufacturing equipment,
- Telecommunication apparatus,
- Instruments and apparatus,
- Data-storage media and software, and
- Parts and accessories.

The categories are evolving over a period of time. It is a challenge for ITA to identify the appropriate classification due to the complexity and fast pace of changing technology. Computers and Data-storage media and software are relevant in the present context of study. ITA's Computers category focuses more on hardware integration activities and data storage-media and software focuses on software in physical support. ITA policies are evolving over a period of time. The policy formulation are challenging for technology products due to complexity of product. WTOs objective is to make technology accessible across all the countries more easily from economic and utility perspectives. One of the challenges with respect to technology products is presence of global production network (GPN). The technology is conceived and developed across different countries. The intermediate technology goods cross many borders for value addition processes and final product is made available in a country other than the countries where value addition processes took place. In order to measure the impact of GPN on trade, ITA identified vertical specialization (VS) to measure the value added activities across borders. VS calculated as the percentage value of imports directly and indirectly embedded in the exports of a country. In addition to GPN, ITA faces a challenge in classification of technology. The classification is difficult due to technology complexity and interrelation between technologies.

The policies of ITA are directly related with system software. ITA might identify standard features of software and all the organizations competing have to consider standard features and develop product. Standardization of product features would affect the product offer in turn will have an impact on business model.

The categories lack clarity with respect to software. The classification of software is more towards the physical exchange of software. However, the software can be made available without physical exchange over internet. This could be one of the major limitations to interpret ITA for a software exchange. The Classification of computers focuses on exchange of hardware technology across borders.

A few studies were conducted to measure the impact of ITA on international trade. Jospeh and Parayil (2006) argued that there is no change in the demand for ITA products post agreement. However, ITA will help and cannot drive technology product demand across borders. There are other factors such as poor infrastructure, institutions, human capital and policies that might influence the demand of ITA products. Bora and Liu (2006) used gravity regression model to measure the impact of ITA. The results of the study showed that the participation in ITA has increased bilateral trade.

The other aspect of ITA which needs to be considered is the dominance of a few countries in the international trade. US, EU and Japan were the pioneering countries of ITA. The basic purpose of trade agreements was to

facilitate easy exchange of technology across borders creating value for all trading countries. One of the unique features of technology is "standardization" of technology features. The standardization features establishes the basic architecture of technology. Technology architecture is a framework that describes the interaction and interconnectivity of components in technology. Generally, the country that establishes the technology standardization will have first mover advantage. The standard features set are generally based on the technology standard set in domestic market. The countries involved in ITA would like to establish technology standard. Once the standard is accepted and established, the country which has set standard will have competitive advantage. There are several factors that influence the acceptance of standard. A few of the factors could be customer lock-in, critical mass, demand of technology in domestic market. Many countries compete to establish technology standards. China is one of countries competing to establish technology standards. It is one of the key players in ITA. Suttmeier and Xiangkui (2004) call the attempt of China to establish standards as "neo-techno-nationalism". It is a technological development in support of national economic and security interests which is pursued through leveraging the opportunities presented by globalization for national advantage. China is giving special attention to domestic software market. The software standard can be set if there is a strong domestic software market. The standards set at the domestic market will be followed by technology organization to manufacture hardware and software. Hardware and software operate as per the standard set by China. These hardware and software are used by US and European. Hence, US and Europe have to accept and incorporate theses standards in their technology products. For instance, WLAN authentication and privacy infrastructure (WAPI) standard set by China for wireless devices. The importers of this technology have to adopt WAPI since the wireless device manufacturers in China would manufacture devices according to WAPI standards. A few thinkers opine that this is a gross violation of WTO agreement, however, none of the importers of technology which is based standard set by China have reported yet formally.

China is also engaged in developing alternative to Windows operating system. China-Japan-Korea open source software promotion partnership is established to find alternative to Windows. The partnership works on open source platforms such as Linux operating system to establish technology standards. Due to large domestic demand, China is capable of firmly establishing standards for Linux operating system. It is a challenge for the established standards of Windows. There exists open source movement across the globe. China does not want to miss this opportunity to establish its standard and control on software. Kylin is a Linux based operating system developed by China. Recently, Ubuntu had a deal with China to develop Ubuntu- Kylin for China. This is an attempt to replace Windows and establish open source based standards across technology industry.

Due to ITA and WTO, technology is freely exchanged across countries with appropriate tariff measures. Technology exchange has many dimensions that influence the acceptance of technology across the globe. From business model perspective, the technology policies of ITA will influence value creation and distribution process. There are not many restrictions in terms of distribution as such. The distribution is mainly governed through global licenses. These licenses are universally accepted. The other aspect of business model is value creation process. International trade policies are significantly related with value creation process. Technology is exchanged across borders for value adding processes. ITA essentially defines the framework of exchange of technology by GPN. However, GPN has to follow technology standards to add value to technology. The technology standard is strongly influenced by a country which is aggressively promoting its standards. The competing organizations have to follow global technology standards to produce their technology product. Hence, the business model has to consider the global technology standard for the value creation process of system software product in the upstream of value chain.

Legal Environment and Software Products

There are two aspects of legal framework for software. One is software license and the other is software patent. These two aspects have been discussed below.

Legal framework of Licenses

Legal framework will not have any impact on licensing policies of organization among software products. Microsoft, Apple and Linux are the major players in operating system software market. Licensing policies of Microsoft, Apple and Linux are global licenses. However, there is a geography specific usage license which will be specified in the license agreement. The geography specific usage restricts usage of license to the agreed upon location of use. The user can also purchase global licenses which can be easily used and transferred across geographical boundaries.

Software enables users to use computers efficiently and effectively. The usage is dependent on many factors. The existing literature indicates that one of the main factors that drive usage is interface across platform. This is related to the compatibility feature of software. The compatibility factor might lead to customer lock-in. The software might force users to use a specific hardware or software and restrict them to use hardware and software based user's choice. This is one of the technical constraints in software. The situation of compatibility might lead to monopoly. A few of the studies indicate that Microsoft was able to establish monopoly due to technical compatibility constraints erected by its operating system products.

Microsoft in its annual report of 2012 stated that many antitrust and unfair competition class action lawsuits were filed against Microsoft across various state, federal, and Canadian courts by direct and indirect purchasers of PC operating system and other specific software products between 1999 and 2005. All claims in the US have been settled dismissed. It has been estimated that total cost to resolve charges range between $1.9 billion and $2.0 billion. At June 30, 2012, it recorded a liability related to these claims of approximately $500 million. The software product strategy using compatibility feature might be perceived as anticompetitive strategy in legal framework. Microsoft has been facing legal issues within and outside United States. As it is reported in its 2012 Annual report, the European commission was concerned about the inclusion of web browsing software. Based on this the Microsoft displayed an option of browser choice screen to users across all the personal computers in Europe which has Microsoft operating system. Microsoft failed to provide this option for Windows 7 preloaded PCs due to technical error. However, Microsoft did provide the Microsoft fixed this error as soon as it noticed. After fixing the error users got on option on screen to choose the browser application. However, on July 17, 2012, European Commission announced that it had opened proceedings to investigate whether Microsoft had failed to comply with this commitment. The Commission mentioned that if any company is found to have breached a legally binding commitment, the company may be fined up to 10% of its worldwide annual revenue.

The journey of Microsoft has not been trouble free. The legal issues related to Apple Mac OS or Linux has been very negligible. One of the reasons could be the open access to source code. Apple Mac OS has been developing compatible interface to avoid compatibility constraints. However, Apple does have legal cases pending against their other products like iPhone, iPad etc.

The other aspect of legal framework is country specific. In the context of software, legal framework considers two components. One, software product and second its distribution in the country. Software product is evaluated based on features and functionality of product. A few countries' legal framework may not accept the bundling of software applications with operating system. It might restrict user's choice to use software application. Case against Microsoft at European Union cited above is an illustration legal interpretation/framework of product features and functionality. There are not notable cases against Microsoft in India. In fact, one of the major challenges for Microsoft in India is piracy. There have been many cases filed by Microsoft against Indian vendors for software piracy. Business Software Alliance (BSA) reports India has 63% piracy rate in PC software.

The second component of software license legal framework is distribution of software. Software is a global product. It is exchanged across borders in different formats. The law of the land determines legal requirements of software distribution. In Indian context, software attracts import duty if it is purchased outside Indian border. However, the software is purchased in

various forms. Generally, the software is distributed through CD/DVD, OEM or download. CD/DVD and OEM will attract custom tax and free download may not come under the purview of the categories identified. Ministry of Finance under Circular No. 15 /2011-Customs dated 18 March 2011 clarifies the custom duty requirements and tax exemption for the sale of imported software in any form in India. The paper licenses, CD/DVD and OEM licenses fall under the categories where import duty has to be paid and service tax exemption/discount may be provided for resale of imported software.

Legal framework of Software patents

Patenting of software is most debated issue and has not yielded common grounds of understanding and implementation of software patents. Software patents have been examined from TRIPS and domestic patenting laws adopted by countries.

TRIPS and Software

Trade Related Aspects of Intellectual Property Rights (TRIPS) is an international agreement administered by the World Trade Organization (WTO) which was formed in the year 1995. At present there are over 155 countries under TRIPS. TRIPS agreement provides intellectual property law in international trading system. TRIPS requires WTO members to give copyright , covering content producers which includes performers, producers of sound recordings and broadcasting organizations; industrial designs; integrated circuit layout-designs; patents; new plant varieties; trademarks; trade dress; and undisclosed or confidential information. TRIPS also mention enforcement procedures, solutions, and dispute resolution procedures. Protection and enforcement of intellectual property rights will meet the objectives to promote technological innovation and transfer and dissemination of technology, for the mutual advantage of producers and users of technological knowledge and in a way which will be conducive to social and economic welfare. (Wikipedia, 2014)20.

Patenting software is a complex process. According to Article 10 of TRIPS agreement, software is classified under the category of Arts not under technology category. Lack of clarity on software in TRIPS agreement has created vacuum for interpretation of Law. The domestic law interprets software component of TRIPS according to its convenience. The agreement fails to categorize software appropriately. Therefore, it is difficult to identify the copyrighted or patented components of software. The software producers are unable to patent their source code due to lack of clarity in TRIPS agreement. Reichman (1995) states that software code cannot be patented. However, the software usage behavior of customer can be patented. Software usage behavior is related with the interface and interconnection with multiple platforms. The user pays for the interface not just the software code alone.

Software patenting has been interpreted in several ways by countries. There has been disagreement on software patenting across many nations. A few countries are advocating open standards of software, where patenting will not have any relevance. A few countries do have patenting framework for software but lacks the clarity of what has to be included in patenting. There are two major agencies granting software patenting. One is confined to European region known as European Patent Office (EPO) which grants software patents and the other is for US region known as United States Patent and Trademark Office (USPTO).

Gert Kolle (1977) was one of the early advocates of open standards. Kolle argued that software patenting cannot exist. The software does data processing through instructions. The instructions are in the form of source code. The source code cannot be complied by one individual or organization. It involves a group of programmers. The source code is compiled from various authors/programmer. The author cannot be singled out and grant paten for a specific source code. The source code will also be integrated with hardware. Therefore, the patenting process gets more complicated.

According to en.swpat.org, In USA, the patent office is the authority which grants software patents and they have been upheld many times in lower courts., However, the Supreme Court never gave a verdict on whether a software is patentable or no. The European Patent Office is an authority that grants software patents in Europe. Most of the Courts in Germany have rejected them, but a few courts in the UK have upheld them. There is always uncertainty of the decisions. The patent holders are afraid of losing their patents and

therefore they avoid going to court. However this may lead to more problems. There is always possibility of Software patent holders misusing the patent. They can threaten software developers, and they can demand sums of money. If the software developer doesn't have enough financial strength to defend themselves in court, resulting in the patent holder winning and will get money or market control though their patent is probably invalid. The other side of the issue is that the software developers are afraid of adding some compatible features due to the threat by patent holders. They are afraid of the cost involved in resolving legal issues. Therefore, they might exclude some of the applications or compatibility features.

There have been numerous studies and discussion on software patenting. Neither academia nor industry has resolved to a basic framework of software patenting. This will directly impact consumer. The usage of software is dependent on software features. However, the software features such as interface and inter-operability are linked with licensing and patenting. If the software developing organization is unable to have clarity on patenting, then the organization may not develop software as a bundle of many applications and features due to the fear of legal issues arising out of patenting. Some of the applications and features bundled in software may be patented and may not be disclosed. Mark Shuttleworth states that Microsoft is involved in an activity of racketeering. He says that Microsoft is asking to pay for patents but do not specify which features are patented.

Generally Microsoft is blamed for Patent trolls. Patent trolls are mechanism where organizations acquire patents to extract money from product developers. In the context of software, Microsoft is engaging patent trolls. It is apparent from a few of the cases filed in the court. For instance, Microsoft sued Melco group which deals with network attached storage devices. Microsoft said that Melco uses Linux operating system and a few of the functionality and features used in the system are patented by Microsoft. However, Microsoft has not declared the details of patents infringed by Melco. Patenting of software might result in customer lock-in. The features and functionality will be controlled through the patents. The software will be made available with product developers who abide by the patents and pay the required usage fees to add patented feature in their product.

It is evident from the facts that software patenting is a complex activity and will have direct impact on consumers. The software patenting revolves around the functionality and features of software.

The functionality and features can be managed through licensing. Therefore, licensing could be a substitute for copyright or patenting. Most of the licensing policies are universal. Therefore, the licensing terms might also cover the internationally traded software. WTO can incorporate software under appropriate category and provide the licensing framework for internationally traded software or technology. The clarity must be established in order to establish common ground to interpret copyright and patenting of software products.

Conclusion

This research paper makes an attempt to identify and analyze the issues related to operating system products from international trade perspectives. It has been identified that ITA plays a significant role in value creation process for operating system products. Value creation process is expressed through software features. Standardisation of operating system product features are linked with international trade policies due to the global product usage. This also is directly connected with the acceptance of product. Therefore, it is necessary for international trade organisation to have more clarity of the policies related to exchange of system software products. In the absence of clarity a few dominant players of the industry will capture the market and sustain its monopoly for a long period of time. Software patenting constitutes significant component in the distribution of operating system product. TRIPS need to pay attention towards software products and bring in more clarity related to software patenting.

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Fire Safety Management in Construction

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Abstract

Fires throughout the world during construction of buildings and its refurbishment are becoming more common. As a result of this people are killed and injured and loss of property has also occurred. In this paper an attempt has been made to study the various safety measures that can be adopted during construction against fire hazards. This paper discusses broadly about the definition of fire, fire protection plan, escaping of the workers, fire fighting, equipments and other precautionary measures to be provided during construction.

INTRODUCTION

Every year there are many fires throughout the world on construction sites and in buildings undergoing refurbishment. As a result of these, people are killed and injured, property is irretrievably lost, including structures of historic interest, and commercial and industrial organizations suffer severe disruption to the smooth running of their businesses.

The construction industry's performance might have been improved over the past few years but the rates of death, serious injury and ill health for construction site workers have still not been taken into consideration. When construction activities are not adequately controlled, children and other members of the public can also be killed or injured, and property adjacent to construction sites can as well be put at risk – for example, FROM A SITE FIRE LARGE ENOUGH TO SPREAD OFF-SITE.

All parties concerned in a project, of whatever size, should work together to ensure that adequate but practical measures are introduced during the design and planning stages to achieve the highest standard of general fire precautions are introduced to ensure the maximum level of protection to the contractors and the structure during the construction or refurbishment operations.

The potential dangers of FIRE are particularly concentrated and severely destructing on many construction sites, where activities includes fire work which in turn lead to a circumstance of FIRE ACCIDENT.

FIRE

Primary aspect of managing a fire safety is to look into the possibilities and causes of a fire accident. The three major components of a FIRE are

• A source of ignition • Fuel • Oxygen.

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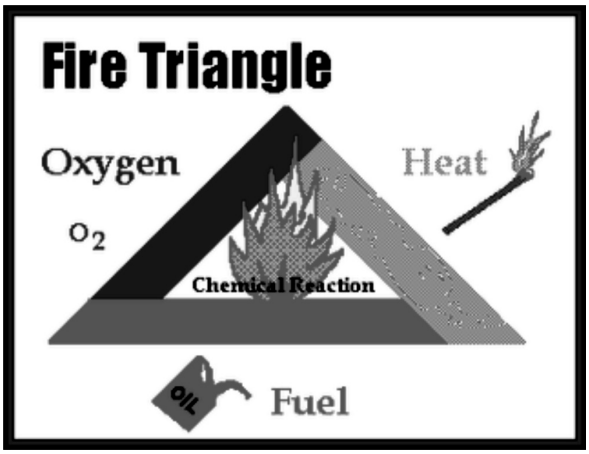
Oxygen is abundantly available in the atmosphere and it is important to take care of the other two components. The Engineer, Mason or a worker, whoever it may be, should make sure that there are no fuel substances around and a source of ignition of fire.



Taking into account the possibility of occurrence of a fire accident in spite of taking care about the components of FIRE, one has to be ready with a plan minimize the possibility. A FIRE PROTECTION PLAN is what it is named as.

Fire Protection Plan

The Fire Protection Plan shall include the following:

1. Procedures for reporting emergencies to the Fire department.
2. Procedures for emergency notification, evacuation and relocation of all persons in the building under construction and on the site.
3. Procedures for hot work operations, management of hazardous materials and removal of combustible debris and maintenance of emergency access roads.
4. Floor plans identifying the locations of exits, exit stairs, exit routes and portable fire extinguishers.
5. Site plans identifying the designated exterior assembly areas for each evacuation route.
6. Site plans identifying required fire apparatus access roadways and on-site fire hydrants.
7. The name and contact phone number of the person(s) responsible for compliance with the Fire Protection.

Water supplies

In the case of large projects, or those where structures are being constructed predominantly of combustible materials (such as timber) the fire brigade should be informed and provisions for water supplies agreed before work commences on site.

Adequate water supplies for fire fighting must be available.

- Rising and temporary mains must be provided where planned;
- Water supplies should be tested periodically;
- It may be necessary to move the fire brigade inlet point to rising mains as work progresses.

The role of the person responsible for fire safety

The person responsible for the fire safety management system and inspections on a construction site must:

- Ensure that all procedures, precautionary measures and safety standards as laid down in the site fire safety plan are clearly understood and complied with by everyone on the site;
- Ensure that a system for the issuing of hot work permits is established and monitored;
- Conduct weekly inspections of escape routes, fire safety signage and temporary emergency lighting (where applicable);
- Carry out weekly tests of the site fire detection and alarm devices installed on site;
- Carry out weekly checks of fire fighting equipment, fire brigade access and fire fighting facilities;
- Carry out weekly checks of the routing of temporary electrical cables, the housekeeping on site and the storage of combustible waste materials;
- Conduct periodic fire drills to ensure that everyone on site is aware of the procedures and reacts appropriately. This includes rehearsing the procedure for alerting the fire brigade;
- Liaise with the local fire brigade and invite them to undertake site inspections and familiarization tours where appropriate;
- Liaise with site security personnel where they are employed;

- Ensure that a proper maintenance regime for fire protection equipment is instituted, including the keeping of a written record of all checks, inspections and tests;
- Maintain a written record of training of site operatives and of all fire patrols and fire drill procedures;
- Where appropriate, appoint a sufficient number of fire marshals who should be properly trained to assist in the evacuation of the site and take first aid fire fighting measures where it is safe to do so.
- During an emergency, execute those duties required for the safe evacuation of everyone on site, ensuring that all staff and visitors report to the assembly points;
- Take action to promote a fire safe working environment at all times.

Small- and low-risk sites only require very simple plans, but higher risk sites will need more careful and detailed consideration, including:

1. An emergency plan, which should be available before work starts;
2. A responsible person to look after the fire precautionary plan and ensuring that everything is at place.
3. A perfect execution of the plan which ensures that proper positions are taken by the assigned people.

Further, general FIRE precautions should be taken at the event of fire accident and those can be listed as below.

A. ESCAPING OF THE WORKERS

1. Ladders may be suitable for simple projects for small numbers of able-bodied, trained staff.
2. On complex or multi-storey projects temporary proprietary stairwells should be used if reasonably practicable. It may be possible to sequence the building to commission early the permanent stairs to be used as an escape route.
3. Exit onto scaffold, if deemed part of escape plan, should be easily accessible, i.e. not through a window opening unless it is designed for the purpose, with easy access, or full height with the panel removed or balcony opening.
4. Escape routes and exits should be kept clear and clearly signed (never locked when people are on site).
5. Emergency lighting should be installed, if necessary, to enable escape. This is very important in enclosed stairways if normal lighting fails during a fire.
6. An assembly point should be identified where everyone can gather and be accounted for.

B. A FIRE ALARM SYSTEM

1. Check whether it is appropriate for the size of the building, number of storeys and complexity.
2. It should be heard by everyone working on site over normal background noise.
3. It is located so it can be activated immediately.
4. Manual bells are only used on very small sites if they can be operated away from danger.

C. FIRE FIGHTING EQUIPMENT

1. Should be located at identifiable fire points at each storey exit.
2. Serviced and maintained by a competent person.
3. Those carrying out hot work should have appropriate fire extinguishers with them and know how to use them.
4. In high-rise buildings where there is a need for fire protection, consideration should be given to installing equipment such as dry rises as the building progresses.

Smoking

A 'no smoking' policy must be established on the site with the exception of designated areas where smoking will be allowed.

Where a smoking shelter is provided it must be:

- Subject to a specific fire risk assessment;
- Constructed of non-combustible material;
- Where practicable, sited at least 10m away from any building or structure (20 metres on a site where a predominantly combustible structure is being erected);
- Provided with suitable metal ashtrays and a separate metal waste bin with a fitted metal lid;
- Provided with a suitable fire extinguisher.

The immediate area around the shelter and the shelter itself should be kept clear of combustible materials including windblown debris and vegetation.

Over time, an increased understanding of the many factors that contribute to the risk of fire has led to positive developments in the fire protection of commercial structures. Improvements in public fire protection systems and services, as well as increased use of private active or passive systems through fire-protection and loss-control engineering, has meant an overall decrease in the cost of fire. Effective undertaking of the above mentioned precautions along with an overall knowledge of safe construction practices will decrease the number of fire accidents in construction sites.

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Competency Based e-Learning Systems: An Analytical Study of Select Corporate Enterprises in Bangalore

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The Target

Competency is most important nerve center for organizational functions to link to the overall performance. It aligns strategies with priorities of the organization. Corporate e-learning systems can become more successful only if, when it becomes a self-initiated program by each individual at workplace. Today's organizations are incorporating such a competency based approaches in order to be more successful to utilize the human capability at its maximum level. When these (CbceL) tools are used, it provides an opportunity for employees to document and demonstrate their target achievements at work place. The question arises what exactly is Cbcel. It is defined as follows

"Competency based corporate e-learning system is a human resource tool, which enables the corporate enterprise to map employee/team performance gap analysis and to appropriately address through learner centric e-learning courses and develop employees for the betterment of business results at a reduced cost across geographical locations".[38]

Personal learning plan (PLP)is addressed as a best vehicle for competency based e-learning systems. It makes both receivers(employees) and givers(Land D and HR) understand about address the issue of prior learning, (retrospection of past learning) assessment of the present, prospecting for the future by understanding where the gap is (need to develop) choosing from the e-learning portfolio and correct method to achieve the required level of competencies.

HR department would have developed competency framework linked with KPI at various levels with the intention of (past present and future) aligned with individual jobs. The Land D shall develop the curriculum based on addressing Knowledge, and skills with the requirement for current and future. This particular concept is called as competency based e-learning curriculum (may be delivered through electronic form).

The challenge for Land D shall be about employees who are adult learners and deliver the content in the required pattern for different users. The key points they need to understand are:

- The main objective is to mold employees as self-directed learners
- Understand their diverse experiences on different kinds of learning
- Understand employees - different styles of learning
- Different methods they use to solve problems

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- Various e-Learning portfolios
- Levels of courses on each subject matter
- The best methods to test and quantify them to link to performance [39]

However, some of the points are tested through this research. Today companies hardly measure individual results; they mostly count on team results. A study on various teams and groups based on which project they are working on and what learning content should be available for them. The HR and Land D activities have to be synchronized in order to deliver best results. All these experiments and achievements are possible only if, various individuals support and understand context. The next section discusses on adult learning and learning styles.

LITERATURE REVIEW

The secondary research conducted references of various resources like journals, reports, articles, projects and web links lead us to the following key points. The review of literature starts with understanding of corporate learning process by deriving a meaning for variables like learning and job context, streamlining the process of learning in accordance to job requirements for continuous transformation of knowledge in order to perform in the turbulent business environment. Top global organizations have included learning in their routine process with the help of technology. Many studies have contributed to the understanding of the relational phenomenon between learning and job and knowledge. The learning programs are totally different from that of school or college curriculum. Since the business environment is very vibrant, change is the only constantly occurring activity and learning keeps the employees' up to date on the current requirements.

The need driven learning has to be in accordance to learning and development orientation which should be a well-planned task. Many researches in the corporate sector indicate that, people are of strategic importance. Many authors have captured the terms lifelong learning and the "learning society" as the areas of research that contribute to the development of 'workplace learning' as a distinctive field of enquiry. The concept of workplace learning has also been summarized by many authors and researchers, that has brought out the prominent themes like approaches to learning, formal/informal learning and insists on individuals and their learning contexts of work cannot be considered separately. There are also discussions on several aspects about work environment, work content and context of behavior.

The critical aspect of successful human resource learning and development programs in organizations is interest and active participation by employees. Careful design of this development program content cannot compensate for a lack of interest or participation on the part of employees. The authors have brought into light concepts such as growth needs, personal mastery, learning goals, and development orientation within organizational settings. Not only that, but behavioral involvement, understanding self and cultivating positive attitude are the most important challenges in today's organizational context. Some authors also relate between production and learning goals as independent (uncorrelated) and they are not opposite ends of the same continuum.

The concept of learning is addressed on diverged views by many authors although all of them converge at a position called knowledge, creativity and enlightenment of self-etc. The authors pin point on existence of hierarchical structures, groups (teams) and the realist view of objects, activities and people are associated occurrences of learning. Some researches indicate the importance of team learning and continuous learning for smooth flow of organizational process. The process of feedback has been given extreme importance in most of the researches, apart from these concepts like explicit, implicit, tacit knowledge through learning and practice has been citied with criticality.

In the study of competencies and organizational learning, the authors aim to provide a road map for competency based learning. Competencies related to learning and jobs have been paid great attention in the recent times. This has resulted in a plethora of papers and reports on assessment of competencies, definition and including their computation. In straightforward terms learning activities can be linked to scheduling and evaluating with the aim of helping employees to get some required competencies for job context. The competency gap becomes the key measurement element that is

used for action in the organization. The competency gap then addressed through learning activity may be for individual or team competency connecting to the organizational competency requirements in order to achieve objectives/goals.

However, Competency Management System (CMS) helps to identify the core competencies and linked to HR based reward and incentive programs. Some organizations allow their employees to set personalized goals linked to job roles and organizational competencies. Another important fact with regard to competency is it is linked to Performance Management system (PMS) of the Organization. Competency linked PMS is a crucial factor in measuring success of the organization.

In order to remain competitive in an ever-changing, high-tech environment, organizations are investing more money in training employees. Day by day, more and more organizations in the globe are adapting e-learning to meet their training needs because it is less expensive and it could be addressed to many people at a time across boundaries. Corporate or Workplace e-learning used as a powerful tool for training global workforce involved in career-related continuous learning, because it has the benefit of being available on-demand, at any time and at any place. Workplace e-learning also offers a unique opportunity for employees, as they can plan their learning activities at their own convenience. The training environment of workplace e-learning is such that, learners are encouraged to make their own choices about the content and information for studying. The provision of learner control in workplace e-learning gives trainees the ability to focus on selected topics with appropriately designed e-learning portal.

Most of the research studies in e-learning are about higher education, vocational studies and distance learning almost in all the parts of the world (some example countries are Italy, Korea, UK, USA and Canada). These courses include those completely dependent on the internet (with no face-to-face meetings) as well as traditional classroom-based courses with a required or optional distance learning component (including a course web site with additional online resources). Researches indicate that, positive impacts on student learning in terms of increasing overall learning experience and their comfort with using technology. While these advances are exciting, allowing both instructors and students more flexibility and creativity within the learning process, it becomes necessary to explore how these forms of instructional technology influencing student learning. These research papers are ignored because the researchers' lucrative area is specifically concerned with corporate e-learning.

Corporate or workplace e-learning takes different forms and dimensions as the literature review suggests that convenience is the first advantage to be derived. They are TAM for e-learning, effective implementation of e-learning, acceptance and resistance to corporate e-learning, performance-oriented approach to e-learning in the workplace, impact of e-learning in workplace, the influence of learning styles on learners in e-learning environments, the effect of e-learning technology using acceptance and e-learning system service quality on organizational learning based on users' perceptions, convergence, knowledge management, training and e-learning: scenarios making it work.

Most of the researches in corporate e-learning have made use of Donald Kirkpatrick's (1976) four levels of training evaluation. They are reactions, learning, employee behavior and organizational results model. Pre-test, and post-test assessments are frequently used in the e-training courses especially several of the training solutions are formal certification courses. The background study shows that Kirkpatrick's model is more suitable for understanding training evaluation in corporate scenarios.

E-learning models are understood as one of the important areas of research, for getting a clear picture about various modes like learner centered pedagogy, PDP, complexity models of Intelligence etc. Apart from these models, learning style has identified 71 models, in which 13 models are found to be more important and most of the researches have utilized these. Some model reviews are presented like actor models, championing factors that used to capture the adult learners. The research papers also discuss on the various learning platforms models through which the content is delivered. The theory of e-learning research has also come up with customized models which are

specifically used by some organizations only. They are Personalized Adaptive Filtering systems (PAFS) and KPI models. Most commonly described models in E-learning are TAM, Unified Theory of Acceptance and Use of Technology (UTAUT) models, e-learning acceptance model, Meta analytic path model, and TAM extension models. models of constructivist VLE, competence performance approach and Adaptive Intelligent Personalized Learning (AIPL). These models are being discussed as a part of review.

The article on competencies and imitability in the Pharmaceutical Industry makes several contributions to the growing literature on competencies and resource-based view of the firm. At first, the paper addresses gap in previous studies, article investigates the impact of three different types of competencies on firm's performance. These empirical results highlight the jeopardy inherent in acquiring competencies and the importance of new learning. Competency refers to the behavior or performance of an individual. Yet does refer to the underlying ``aspects of a person'', such as their knowledge or skill, that ``enable him/her to be competent''. The focus on individual's abilities like knowledge and skill are portrayed by some authors as competencies of individuals. The concept of performance assessment plays a vital role in evaluating the employee's knowledge acquisition and achievements in the work-place. So performance assessment and competency cannot be split.

.The next point is focused on bridging competencies and e-learning. The concept of learning object is the Center of new means for instructional design of web-based learning that emphasizes on reuse as a quality characteristic of learning contents and activities. The Learning objects are considered as reusable elements that can be used as part of learning designs which is understood as learning repository in electronic databases. This schematic description of

learning design gives an idea for flexibility. The specification provides in describing activitybased learning program which are addressed by some authors as goals, obstacles, actions and prerequisites. (GOAP)

The companies identify core competencies that align with the company's mission, vision and goals,encourage employees to establish personalized objectives that allow them to develop their abilities. The company goals incorporating competencies into performance management activities demonstrates that companies connect achievement to compensation and align employee work to strategic goals. These objectives and goal achieving behavior leads to performance excellence.Most of the successful companies align competencies defined in the performance management system with the company's strategic objectives by formally linking employee development activities. The PMS ensures that knowledge transfer, succession planning and employee training needs become a part of daily operations which is called as competency based Performance management system.Competency-based learning as one component in a powerful strategy for leveraging competency models and maximizing the impact of assessments, training and performance support programs and resources. Many articles addressing competency based learning constitute the foundation for learning and depict the innate makeup of individuals and teams to achieve organizational goals which is a necessary for the future.

The key highlight of this research is to mainly focus on Competency based corporate e-learning which is considered to be highly important and crucial with e-learning systems design for delivering training to adult learners at workplace. In recent years, researchers have made attempts to integrate competency-based models into e-learning programs to allow employees to develop competencies. These studies present an approach for aligning competency based learning process with business activities via e-learning technology. The methodology describes the use of key performance indicators (KPIs) as a framework to link learning with work competencies and performance in e-learning applications. The ultimate purpose of work-integrated learning is to drive business results and to bring about positive changes in behavior and job performance. Competency-based e-learning in the workplace, is recognized for supporting a personalized learning process and facilitating peer communication and collaboration. These are the two key elements in the instructional design for learning system (Chang, 2012).

Most of the studies in competency based e-learning either takes the direction of systems view or technology acceptance model (TAM) in HR point of view among various corporate settings. Some of the literatures reviewed have been presented in the form of case studies. With respect to the methodology for data collection utilized in the literatures is questionnaires method by using snowball sampling or convenient sampling. There are very few empirical research studies found in competency based e-learning.

On the topic of competency based e-learning, various dimensions and different perspectives are discussed and presented by authors in the present literature review. Some of them are competency development in knowledge management and e-learning, To explain further, some authors capture insights into the higher order of competency based e-learning, for specific kinds of jobs. Another view brought out the concept of knowledge space theory, comprehensive skill development program for continuous and consistent assessment. The European community online suggests that, with such kinds of online program even people who are differently able can also be trained. The system architecture needs to match support for individual competency requirement.

Some authors have proposed structural equation model for understanding relationship for e-learning readiness, system quality and outcomes. There are some points contributed towards personalized e-learning environment with intelligent e-tutor. In order to categorize the levels of domains and deliver different requirements CBeL suggests multilevel, domain different skill mapping and procedural skill support. To strengthen the e-learning with improved browser category, platform independent data transformation protocol and java enabled client server a performance diagnosis methodology shall device a roadmap. TheKompetansenettet system has been designed as professional development tool for individuals.

The latest trend in e-learning is to combine KM on accessibility and reusability of intellectual assets of organization and JIT program. Another research in CBeL suggests the use of one language course with different levels of assessment with the help of rubrics. The Performance management competency model is used for capturing behavioral measures against specifications. The idea behind capability mapping is to suggest competency focus on delivery skills that the organization needs for the future.

The CBT is the one that leverages skills appropriately, works in alignment with corporate goals and keeps people focused on the job. The major point of concern is CBT should be properly tailored else may not be of great use.The best method to understand the workable competencies is through relating employee skills with business process instead of job roles. Another method of handling CBeL is through process model which describes sequential steps to be followed to implement appropriately. The KM enabled e-learning portal which applies intelligent taxonomy in association with metadata forms a frame work of logical learning unit. The authors suggest that expert articles could be shared to the entire community and if required deliver new courses based on the expert comments.

Needless to mention that the design of e-learning is an important feature for attracting adult learners and to make them continuously use the available materials. Individual skill gap analysis will help in sequencing the learning materials and structuring learning resources. The detailed plan of competency analysis includes profile management – description, process role, actors, cases, remark etc.

Cbel is also used in Medical education and health care industries through the use ofLOM (Learning Object Meta data) which developed learning objects, Advanced Distributed Learning (ADL) and Sharable Content Object Reference Model (SCORM). The reusable competency map provided power point slides, handouts, reading assignments, self-assessment quizzes at unit level. Some researches also provide details of right kind of personalized serviced delivery with sequencing orders via LOM. The learning ladder is also an important point to consider for sequencing the learning delivery. The program may contain analogies, case studies, chart and diagrams, check list, instructional games and simulations, mind maps, models, pictures, stories, self- test, quizzes, questionnaires and writing task by different styles of introducing expectation, topics, which also inclusive of sub headings, symbols and icons.

The interesting feature and latest development in this field is called as "digital competence". The EU has clarified certain definitions about digital competence. In addition, to put forth a point on technology, the latest feature is integration of popular LMS with the system which finally reduces overall band width with data application and video sharing. The concluding remarks states that future of distance learning technology with surpass all these methods and effective integration of many more platforms and methods will be the future scenario.

COMPETENCY BASED CORPORATE E-LEARNING

Understanding the psychology of learners: Most of the learners in corporate are adult learners hence, understanding the psychology, perception of requirements becomes a very critical aspect. Emotional processes involved in e-learning are interesting from the user psychological point of view, as they enable to deepen understanding with respect to emotionality involved when using technology. One of the leading ideas in user psychology is explanation. The theory of andragogy instructs us that the best way to assist adults in their learning includes informing them why they need to know the topic, teaching the topic using experiential learning techniques, and having the adults solve a problem that is of immediate importance to them.

Significance of professional learning calendars for employees across board: The professional learning consists of organizational need based learning, occupational requirement learning, individual learning needs and professional learning. Depending on the activity, task, skill requirement professional leaning calendar need to be prepared considering the positional and individual's development prospects.

Content Update: Content is the most essential part of e-learning. It is considered as a face of e-learning. Content is shared, reused; it may be requirement of books or games, or a model. Updating is very important. Most of the e-leaning portals and servers is the content not updated due to monotony feel of learners.

Learner Centric environment: Most of the employees take up e-learning because it is tailored to the requirement of individual's needs. It is a perspective of talent, interest, specific needs and practices.

Knowledge transfer methods (KTM): KTM covers content, quality, language, standards, mode of presentation, perspective of understanding etc.

RESEARCH OBJECTIVES

The researcher was able to identify five major objectives and five sub objectives which are listed below:

- To identify and analyze the current e-learning practices scenario in BPO sector.
- To examine the correlation between e-learning and performance.
- To analyze the current training and learning methods followed.
- To assess the potential of competency based e-learning for employee development in ITES sector.

The sub objectives are as follows:

- To identify the correlation between competency and performance.
- To identify those personal and Group Characteristics which have an influence on performance.
- To assess whether any improvement in job knowledge influences the overall performance.
- To examine corporate e-learning technology's influence on the e-learning styles.
- To identify influence of e-learning delivery methods on individual performance.

HYPOTHESES

The aforesaid objectives led to the formulation of following hypotheses:

- **H1:** There exists correlation between competency and performance.
- **H2:** There is a significant influence of personal characteristics on individual performance
- **H3:** There is a significant influence of group characteristics on team performance.
- **H4:** There is a significant influence of experience on improving job knowledge.
- **H5:** There is a significant influence of e-Learning delivery method on individual performance.

- **H6:** There is a significant influence of e-learning technology and e-learning styles.
- **H7:** There is a significant influence of 360 degree e-learning on competency.
- **H8:** e-learning increases job knowledge leading to significant improvement in overall performance.

RESEARCH FOCUS

- Organizations contribution towards employee development and performance excellence.
- Organizations commitment towards learning environment
- Competency based learning environment
- Training through electronic mode
- Understanding commitment of HR
- Understanding training methods
- Understanding about the Learning department activities

METHOD OF DATA COLLECTION

A personal hand on delivery method has been used to administer the questionnaire. This method of data collection is chosen because of the following benefits:

The researcher delivers to the potential respondents by self-administration.

The researcher can note the view points of the respondents chosen for study.

The researcher can identify other practical problems while doing the survey which may be useful for research.

Moreover, for this research this is one of the best methods to collect data because it has minimized bias in qualitative data.

Population of the study: The universe of the study is those companies which have incorporated e-learning systems in the present context. The information technology enabled services which are registered are incorporated in India form the universe. There are about 2560 ITES companies.[3]

Sampling Frame: There are about 560 ITES companies in Karnataka (22% of ITES are in Karnataka) that includes seven major sectors of ITES. The categories include BPO, CAD/CAM/CAE, WEB DESIGNING AND WEB SERVICES, MEDICAL TRANCRIPTION, DATA DIGITIZATION, E-COMMERCE AND GIS.4For this particular research BPO is chosen as Bangalore hosts 49 companies which are wings of global IT major players.

Sampling unit: Top 20 BPO companies based on revenue generated and number of people employed.[5]

Stage 1: All the employees of ITES in the BPO sector in Bangalore were enlisted. Only the first level employees who are into process handling were taken into account for the purpose of survey.

Stage 2: A complete enumeration of learning team / heads/executives who are responsible for process of ITES in the BPO companies was done.

Stage 3: The human resources in charge for the process and the competency were evaluated through the data collection instrument.

Calculation of sample size: Bangalore population has of 2.5 lakhs, BPO/call center industry has about 28-38%: approximated value on 2, 50,000[6] (First level employees) assumed as N = 78750.

Sample space: First level employees/executives who are into process.

Precision 10% error

Finite population correction factor=N-1/n-i

Determination of sample size for finite population $n = pq/б_p^2$

$P=q= ½$

$б= \sqrt{pq/n}$

$= ½ \sqrt{1/n}$

$б^2= 1/n * 1/n$

$б_p= 0.10/3.09$

$б_p= 0.03236$

n= 0.25/.001047 = 238.777 n= 250
(for BPO employees stage 1)

Stage 2: Learning and Development n=30 (49 companies –sample from each company)

Stage 3: HR department n=30 (49 companies –sample from each company)

Type of Sampling: Univariate Stratified Random sampling used for data collection from BPO. This is the simplest form of sample; it gives a single variable or unit of analysis. The smaller groups of strata, where in the sample has variety of attributes. The pooled strata used to choose sample from which respondents are picked at random.

FINDINGS FROM THE ANALYSIS (stage I)

- The study has validated the formal hypotheses
- There exists correlation between competency and performance.
- There is significant influence of personal characteristics on individual learning process.
- There is a significant influence of group characteristics on team learning process
- Improvement individual job knowledge has influenced overall performance although individually there is no significant improvement from e-Learning.
- There is significant influence on corporate e-Learning delivery method on individual performance.
- Corporate e-learning technology has significantly influenced the learning styles.
- Two hypotheses have not been supported by the study

1. There is no significant influence of 360 degree corporate e-learning on individual competency.
2. e-Learning although increases job knowledge has not made any significant improvement in business result.

FINDINGS FROM THE ANALYSIS (Stage II)

- Out of 19 dimensions only 7 dimensions have greater statistical significance by gender.
- E-Learning content object and e- learning usage are significantly and statistically at 10% and 15% respectively.
- Learner convenience is high for low salaried personnel as compared to higher level counter parts.
- Learning content and learning platform appears to be similar across all categories.
- The employees with higher salary levels tend to exhibit lower interests towards learning.
- In the correlation analysis in the Land D activity covering 19 dimensions there is negative and get significant association between individual performance and team psychographics.
- There is significant influence on Land D activity is e-learning stage implementation and total performance.
- The e-learning content is perceived to be making negative influence of the employees of Land D department

FINDINGS FROM THE ANALYSIS (Stage III)

- The mean levels of these dimensions suggest that females are consistently and relatively better as compared to male counterpart (N=40).
- In respect of competency development there is not much difference in terms of perception between male and female HR.
- HR people are quite competent in making performance assessment, performance duration and overall performance itself.
- Most of the HR executives are 80% highly qualified in the ITES sector. This is a good pitch for ITES sector on which functional HR can be taken up effectively.
- The dimensional variables which are suppose to make positive influence are making negative influence both at individual and team level.
- As a team their contribution is positive but not statistically significant.
- The correlation between individual and team performance with 12 dimensions of HR have been analyzed. The results not surprisingly show positive correlation.

CONCLUSIONS

As far as BPO's are concerned, the researcher' is concerned **'Competency based e-Learning'** is at a bad state of affairs, only 20% - 30% of the BPO use e-learning to some extent that too only top companies like TCS, Accenture, HP have taken up e-learning other Organizations have still to a long way to move in order to implement these methods.

This study has clearly demonstrated four factoral dimensions that would lead to capturing variations across learning. These factoral dimensions have to be considered while pre paring resource materials and career planning for employees. Induction of skills and knowledge along with positive experience may help enhance efficiency of e-leaning programs. The e-learning programs can be effectively delivered by taking into cognizance those attributes which will need to higher levels of efficiency at the individual level and overall performance at aggregate level.

RESEARCH LIMITATIONS

- The outcome of the study depends entirely on the fairness of information supplied by respondents.
- Paradigm shifts due to change in environmental, workplace and individual factors.
- The study is restricted to a select group of corporate enterprises in Bangalore; hence the problem of generalization
- Despite these limitations, our research investigation will expand the knowledge horizon in the e-learning domain and opens up the opportunities for the introduction of e-learning systems much to the efficacy of e-HRM and benefit both employee as well as organization.
- Sample size, through statistically calculated, not enough to make concrete projections.
- Dearth of information has always been a limitation for any study, but as far as this study is concerned, totally relied on the perception data of select employees.

FUTURISTIC NOTE

The present study is indicative of the state of e-learning in ITES organizations while there is a need for a change in setting the trends for future, similar studies for other types of organizations may facilitate growth and development of employees and the organizations. The present study with appropriate adaptation in the instruments may be taken up to derive benefits for immediate future and long term.

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Web links used

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http://www.leadershipcoach.us/competency.html

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http://www.tanz.ac.nz/pdf/the_workplace_elearner_wace.pdf

http://www.findlearning.com/learn/ls.nsf/rlookup/sixsteps?open

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http://www.ddiworld.com/DDIWorld/media/trend-research/state-of-e-learning_es_ddi.pdf?ext=.pdf

http://www.iglean.co.uk/blog/docs/LearningStylesELearningEnvironments.pdf

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http://www.academia.edu/1353646/The_7_E-Learning_Barriers_facing_Employees_-_Penina_Mungania_2003

BOOK REVIEW

A TEXT BOOK OF COST MANAGEMENT:
G.V. Keshava Rao, D. Gopinath, M.G. Krishnamurthy & Anitha S. Yadav; Paramount Publishing House, 3-5-1105, 2nd Floor, PVR Estates, Narayanaguda, Hyderabad-500 029, India; First Edition, 2013, pp1-296+xi.

Reviewer: N.S. Viswanath

The present book under review deals with cost. This book is specifically written for MBA programme of VTU. This is based on application of marginal principle and methods of costing. Added to this is the control aspects of costing based on principles of management. The book is divided into eight modules in a logical sequence. Each module is dealt for solving problems connected with costing. Interesting aspect of this book is application of marginal principle and linking up cost, volume, and profit relationships. Each chapter has a theoretical foundation followed by relevant & associated problems. The thought flow is written with rigour and life by enumerating implication of each tool in solving practical problems. The best module appears to be cost audit which is in the domain of cost management. The rules, procedures and practices of cost and management audit are written in the Indian context. Cost, control and activity relationships are well brought out accordingly from modules 1 to 4. The module in management reporting appears sketchy. Some standard examples of management relationship on cost audit should have been added. The module 8 presents an interesting reduction, control and target costing. The use of statements in control of quality is highlighted. The application of balanced score card which is frequently used in organizations is enumerated. An example of application of balance score card to industry, cooperative and not for profit organizations (NPOs) may have been attempted. There is a need to expand the last chapter to enable the accountants in the MNC companies to derive the use of this book.

The book will serve as a guide for first students of costing. This will be useful to the students of chartered accountancy examinations & to the practitioners of accounting. The authors deserve congratulations for their best efforts in publishing this work.

TO FEEL ARE NOT TO FEEL

To Feel or Not to Feel: Anjali Anirudhan:
Cyberwit.net, HIG 45, Kaushambi Kung, Kalindipuram, Allahabad-211 011 (UP), India;
First Edition, 2014, pp1-69

Reviewer: N.S. Viswanath

Imagination is a psychological exercise which will help people grow and make others grow under most stressful circumstances. Here is an anthology of poems by a student of business who is working as a Tax Consultant in an MNC organization in India.'To feel or not to feel' is an interesting & emotional output(not outburst)to think about nuances of life. This anthology of 50 poems deals with duality, dimension, play with words and finally go beyond words! Each poem deals with a theme connected with a domain of life. All imageries such as sun, moon, black & white, dark & light, good & bad, are all confirmed with sooth feelings. Anything which is felt at any time, on any occasion,becomes a theme for introspection. This author sees rainbow as "painting the air". She knows the 'colour of greens'. She thinks of the magic way. Anything which is unexpected is the magic way for her! She makes people 'deaf' and prompts them to open up. Each poem speaks of the soft interaction between i & I. Time, space, shape and nature will make her think in several ways. She claims to make people stop think to think always! Fear or source of fear will not throttle her. She intends to connect with the ocean. She derives finally that we are all alone! She waits for the time and reflects hope in the eyes. The anthology of poems surprisingly has no creative use of language of business or taxation. A few can have this talent i.e., the talent of giving beyond these words and creative phrases. Every poem read at once will make a reader murmur. The poems here have the ability to distort inner serenity. The author reserves recognition for her talent which has just begun. She has the ability to listen here, whisper and finally derive strength in nature. She talks of brevity in the context of facing problems. Her choice is to chase "freedom" to claim, to grow and to manifest. The reviewer hopes of a great life of literature for this young talent. All students of business, I wish,to be as creative as this writer of words is if not more!