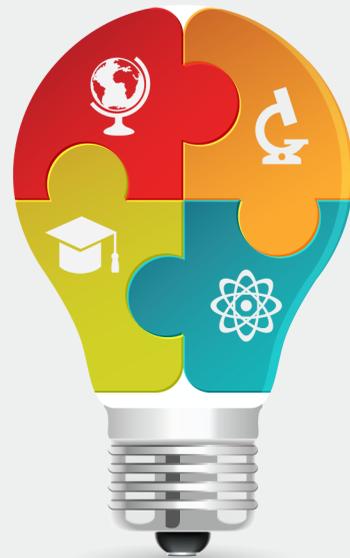


### In this issue

- Customer Satisfaction on Services of Lakshmi Vilas Bank and Nationalized Banks in Tiruchengode: A Comparative Study  
S. Ramesh
- Assessment of Technologies for Discoms in NCR and Development of Power Distribution Technology Implementation Index  
Vipin Khurana, Varun Prakash & ORS Rao
- Impact of Packaging on Consumers' Buying Behaviour: A Case Study of Mother Dairy, Kolkata  
Bidyut Kumar Ghosh
- Knowledge Management Orientation of B-School Processes: A Case Research  
Sanghamitra Brahma & Sumita Mishra
- Business Intelligence Systems: A Necessity for Agile Supply Chains  
Subrat Sarangi
- Millennium Development Goals and Post 2015 Framework: An Indian Experience  
Shikta Singh
- Paradigm shift towards Mobile Marketing: A study on Consumer's Perspective  
Ritesh Dwivedi
- Application of Bayesian Credibility Theory in Movie Rankings to Reduce Financial Risk of Production Houses  
Palash Ranjan Das
- Board Composition, Board gender diversity and Firm performance: Evidence from India  
Saroj Kumar Routray & Ranjan Kumar Bal
- Diffusion of Technological Innovation in Business: A Study on New Generation Business in India in E-Business Environment  
Soumendra Kumar Patra, Durga Madhab Mahapatra & Rabinarayan Patnaik
- Learning Organizations in Action: Evidence from the Downstream Hydrocarbon Industry in India  
Ashok K Sar
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Souvik Banerjee
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Rabinarayan Samantara & Nidhi Sharma
- Key Processes Adopted For Transportation Management System In Small Scale Firms  
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### CONTENTS

- **Customer Satisfaction on Services of Lakshmi Vilas Bank and Nationalized Banks in Tiruchengode: A Comparative Study** 1-12  
*S. Ramesh*
- **Assessment of Technologies for Discoms in NCR and Development of Power Distribution Technology Implementation Index** 13-26  
*Vipin Khurana, Varun Prakash & ORS Rao*
- **Impact of Packaging on Consumers' Buying Behaviour: A Case Study of Mother Dairy, Kolkata** 27-34  
*Bidyut Kumar Ghosh*
- **Knowledge Management Orientation of B-School Processes: A Case Research** 35-51  
*Sanghamitra Brahma & Sumita Mishra*
- **Business Intelligence Systems: A Necessity for Agile Supply Chains** 52-65  
*Subrat Sarangi*
- **Millennium Development Goals and Post 2015 Framework : An Indian Experience** 66-74  
*Shikta Singh*
- **Paradigm shift towards Mobile Marketing: A study on Consumer's Perspective** 75-94  
*Ritesh Dwivedi*
- **Application of Bayesian Credibility Theory in Movie Rankings to Reduce Financial Risk of Production Houses** 95-106  
*Palash Ranjan Das*

- **Board Composition, Board gender diversity and Firm performance: Evidence from India** 107-120  
*Saroj Kumar Routray & Ranjan Kumar Bal*
- **Diffusion of Technological Innovation in Business: A Study on New Generation Business in India in E-Business Environment** 121-134  
*Soumendra Kumar Patra, Durga Madhab Mahapatra & Rabinarayan Patnaik*
- **Learning Organizations in Action: Evidence from the Downstream Hydrocarbon Industry in India** 135-151  
*Ashok K Sar*
- **Determinants of Dividend Policy for Select Information Technology Companies in India: An Empirical Analysis** 152-157  
*Souvik Banerjee*
- **A Review of Organisational Conflict Literature** 158-179  
*Rabinarayan Samantara & Nidhi Sharma*
- **Key Processes Adopted For Transportation Management System In Small Scale Firms** 180-190  
*Vipul Chalotra*



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# Customer Satisfaction on Services of Lakshmi Vilas Bank and Nationalized Banks in Tiruchengode: A Comparative Study

**S. Ramesh**

Associate Professor (MBA),  
K.S. Rangasamy College of Technology, Tiruchengode, TN  
rameshvijayalayan2002@gmail.com

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## ABSTRACT

*The main aim of the study was to examine the level of satisfaction of customers on various banking services offered by Lakshmi Vilas Bank and other nationalized banks in Tiruchengode taluk and make comparison between the banks. Data was gathered among 300 respondents in Tiruchengode taluk through a well-structured questionnaire and the authors attempted to develop a model for measuring the contributory level of various factors to customer satisfaction and tested for validity through Structural equation modeling. The study revealed that the primary factors leading to customer satisfaction are Personal attention, Safety, Technical, Staff service through Comfort factor. It is concluded through this study that the overall satisfaction level on various banking services of LVB is better than other nationalized banks in Tiruchengode taluk.*

*Key words:* Banking Services, Customer Satisfaction, Structural equation modeling

## 1. Introduction

Customer satisfaction is the key to long term success of any organization. Keeping the importance of customer satisfaction in mind, banks need to maintain stable and close relationships with their customers. Customer satisfaction levels need to be judged. The application of the knowledge of customer satisfaction is imperative to establishing and maintaining a long-term relationship with customers and long-term competitiveness. Banking is a high involvement industry. Banks

recognize the fact that delivery of quality service to customers is essential for success and survival in today's global and competitive banking environment. Researchers have found that customer satisfaction has a measurable impact on purchase intentions and on a firm's financial performance.

Customers' wants, needs, and expectations change quickly. Therefore, what would have delighted and surprised them a short while back might not satisfy

them at present. Banks may not be able to provide superior services to the customers unless customer expectations are known. Customer expectations can be known through the knowledge of satisfaction levels of customers. This necessitates the measurement of customer satisfaction level. Customer satisfaction cannot be measured unless the factors affecting customer satisfaction are determined. This necessitates an in-depth study about the factors affecting customer satisfaction.

### **Banks selected for Comparative Study**

This study is mainly focuses on customer satisfaction in Lakshmi Vilas Bank (LVB) and Other Nationalized Banks (ONB) like Indian Bank, Indian Overseas Bank, State Bank of India, etc.

## **2. Literature Review**

Ganguli and Roy (2011) studied the factors affecting customer satisfaction in the Indian retail banking sector. Online structured questionnaire developed to determine the factors for customer satisfaction was distributed among the respondents. The dimensions were identified using an exploratory factor analysis (EFA). Next the reliability and validity of the factors for customer satisfaction were established through confirmatory factor analysis (CFA). The paper identifies four generic dimensions in the technology based banking services, customer service, technology security and information quality, technology

convenience, and technology usage easiness and reliability. It was found that customer service and technology usage easiness and reliability have positive and significant impact on customer satisfaction.

Al-Eisa and Alhemoud (2009) attempted to identify the most salient attributes that influence customer satisfaction with retail banks in Kuwait and to determine the level of the overall satisfaction of the customers of these banks. A multiple attribute approach proposed by Shin and Elliott (2001) was employed. This approach was applied in the analysis of data collected from a convenient sample of retail banks in Kuwait. The most crucial collected from a convenient sample of customer satisfaction with retail banks in Kuwait were fast service, courtesy and helpfulness of employees and availability of self-banking services.

The predictors of customer satisfaction in the German retail banking sector were studied by Kanning and Bergmann (2009). Field study method was applied to find the factors affecting customer satisfaction. The major factors identified were performance of banks and fulfillment of customer expectations.

The factors affecting customer satisfaction in the Malaysian retail banking sector was conducted by Ndubisi and Wah (2005). A field survey of bank customers in Malaysia was conducted using a structured questionnaire. The data were factor analyzed to determine the key

dimensions of customer satisfaction. The results showed that five key dimensions, namely competence, communication, conflict handling, trust, and relationship quality, were the major determinants of customer satisfaction.

### 3.1 Research Design, Sample Size and Data Collection

The research design used for this study is descriptive research. The main purpose of descriptive research is description of the state of affairs as it exists at present. The aim of this approach is to portray the customer's satisfaction towards various banking services. Sampling is the act of selecting a representative part of a population for the purpose of determining the characteristics of the whole population. Simple size refers to the number of items to be selected from the universe to constitute a sample. Sample size for this study is 300 customers, comprising of 129 from LVB and 171 from ONB.

Primary data collected through conducting Personal interview by framing questionnaires. A well structured questionnaire was prepared and distributed to the respondents and information was gathered during April, 2014. The questionnaire consists of a number of questions printed in a defined order on a form or a set of forms.

### 3.2 Tools for the Study

Percentage Analysis, Mann-Whitney U Test, Factor Analysis

Structural Equation Modelling

## 4. Data Analysis and Interpretation

4.1 The data gathered from 300 respondents in Tiruchengode taluk through a structured questionnaire was entered into SPSS software and further analyzed to arrive at meaningful conclusions. The results of the data analysis and their interpretations are described in this session.

**Table 4.1.** Demographic details of customers

Demographic factor	Level	LVB (No.)	ONB (No.)	LVB (%)	ONB (%)
Gender	Male	91	89	71	69
	Female	38	82	29	64
Age (years)	Upto 35	82	108	64	63
	Above 35	47	63	36	37
Education	Upto H.Sc.	27	41	21	24
	UG	54	98	42	57
	PG	41	25	32	15
	Professional	7	7	5	4
Occupation	Private	41	40	32	23
	Corporative	28	41	22	24
	Business	48	51	37	30
	Professional	5	8	4	5
	Student	7	31	5	18

It can be seen from the above table that a considerable difference in the proportion of female customers and rural customers – more in ONB than in LVB.

#### 4.2 Level of Satisfaction – A Comparative Analysis

The respondents were asked to rate their level of satisfaction on various attributes leading to satisfaction on a 7-point liker scale, 1 being the lowest level and 7 being the highest level of satisfaction. The mean level of satisfaction of customers on various parameters of study through 26 variables along with test results of Mann-Whitney U Test for difference in two banks is tabulated in Table 4.2.1. It can be also visually seen from the above table that the mean level of satisfaction of all the variables for the bank LVB are higher than Other

banks. Hence it can be easily inferred that the services of LVB is better than other banks in Tiruchengode taluk. The non-parametric test Mann-Whitney U Test was used to test the differences in mean level of satisfaction of two banks in different variables are statistically significant and the result are shown in Table 4.2 (only variables with significant difference is shown).

The null hypothesis is taken as there is no significant difference in the mean level of satisfaction of respondents on various variables with respect to LVB and other nationalized banks against the alternative there is a significant difference in the mean level of satisfaction of respondents on various variables with respect to LVB and other nationalized banks.

**Table 4.2:** Mann Whitney U Test Results : Level of Satisfaction vs. Bank

VARIABLES	Name of Banks		Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
	LVB	ONB			
	Mean	Mean			
Banks fulfils its promises at the time indicated	5.47	4.20	5294.5	-7.943	0.000
Bank staffs have the knowledge to answer all my questions.	6.00	4.66	6297.5	-6.538	0.000
Distance to the office (premises) of the bank.	5.39	3.96	5894	-7.005	0.000
Materials like pamphlets, statements are virtually appealing at the bank.	5.48	4.91	8113	-4.090	0.000
Bank performs the services exactly at the first time.	5.67	4.86	7096	-5.485	0.000
Banks has my interest at heart.	5.68	5.22	8858.5	-3.058	0.002
Bank gives me individual attention.	5.70	4.86	6993	-5.62	0.000
Bank has modern equipment & tools.	5.36	4.6	8475.5	-3.499	0.000
Bank staffs give me prompt service.	5.76	5.08	7951	-4.339	0.000
Bank operating hours convenient to me.	5.87	5.12	7721	-4.631	0.000
Bank show a keen interest in solving your problems.	5.82	5.24	8069.5	-4.126	0.000

Bank staff behavior instills confidence in me.	5.95	5.3	7567.5	-4.888	0.000
Bank physical facilities virtually nice.	6.59	5.88	6700	-6.331	0.000
I feel safe in my transactions with the bank.	6.16	5.43	7432.5	-5.055	0.000
Bank staffs are courteous with me.	5.78	5.26	7924.5	-4.355	0.000
Banker staff tells you exactly the time the service will be performed.	5.91	5.12	7445	-4.997	0.000
Bank employees are neatly appealing.	5.82	5.46	8866	-3.045	0.002
Bank staff always willing to assist you.	5.84	5.35	8416.5	-3.68	0.000
Bank insists on error free records.	6.09	5.61	7935	-4.373	0.000
Bank staff understands my specific needs.	5.95	5.41	8314	-3.807	0.000
Bank staffs are not too busy to respond to my request.	5.67	4.85	8145.5	-4.008	0.000
Bank offers online trading facility.	6.23	5.75	1957.5	-3.181	0.001
Overall satisfaction with your bank	6.35	5.92	8484.5	-3.669	0.000

### 4.3 Factor Analysis

Factor analysis was used to reduce the number of variables contributing to customer satisfaction; the study included as many as 26 variables and in order to reduce the number of variables and to find the main underlying constructs of

customer satisfaction, factor analysis was carried out and the results of factor analysis are presented in Tables 4.3. The following table represents the rotated component matrix using 0.3 as a cut-off point for factor loading for naming the factors. In this way we get five factors.

**Table 4.3 : Rotated Component Matrix<sup>a</sup>**

Factor	Variables	Component (Factor Loadings)				
		1	2	3	4	5
<b>Personal</b>	Bank gives me individual attention.	.766				
	Bank show a keen interest in solving your problems.	.714	.384			
	Banks has my interest at heart.	.707				
	Bank insists on error free records.	.684				
	Bank staffs are courteous with me.	.658				
<b>Technical</b>	Bank staff have the knowledge to answer all my questions.		.883			
	Distance to the office (premises) of the bank.		.765			
	Banks fulfils its promises at the time indicated		.744			
	Materials like pamphlets, statements are virtually appealing at the bank.		.701			
<b>Comfort</b>	Bank staff always willing to assit you.			.714		
	Bank operating hours convenient to me.			.677		

<b>Safety</b>	Bank has modern equipment & tools.				.689	
	Bank offers safe and secured e-banking services.				.684	
	Bank offers safe bill payments.				.642	.434
<b>Staff service</b>	Bank staffs are not too busy to respond to my request.					.837
	Banker staff tells you exactly the time the service will be performed.			.504		.598

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Factor 1 will comprise of variables Bank gives me individual attention, Bank show a keen interest in solving your problems, Banks has my interest at heart, Bank insists on error free records, and Bank staffs are courteous with me. This factor is named as **‘Personal’**. Factor 2 comprises the variables Bank staff have the knowledge to answer all my questions, Distance to the office (premises) of the bank, Banks fulfils its promises at the time indicated, Materials like pamphlets, statements are virtually appealing at the bank. This factor is named as **‘Technical’**. Factor 3 comprises of the variables Bank staff always willing to assist you, Bank operating hours convenient to me. This factor is named as **‘Comfort’**. Factor 4 comprises of the variables Bank has modern equipment & tools, Bank offers safe and secured e-banking services, and Bank offers safe bill payments. This factor is named as **‘Safety’**. Factor 5 comprises of the variables Bank staffs are not too busy to respond to my request, and Banker staff tells you exactly the time the service will be performed. This factor is named as **‘Staff service’**.

#### 4.4 Structural Equation Modelling

The characteristics of customer satisfaction of the banks have been studied using the five factors, viz. Personal factors, Technical factors, Comfort factors, Safety factors, and Staff service factors, as depicted in the model depicted below.

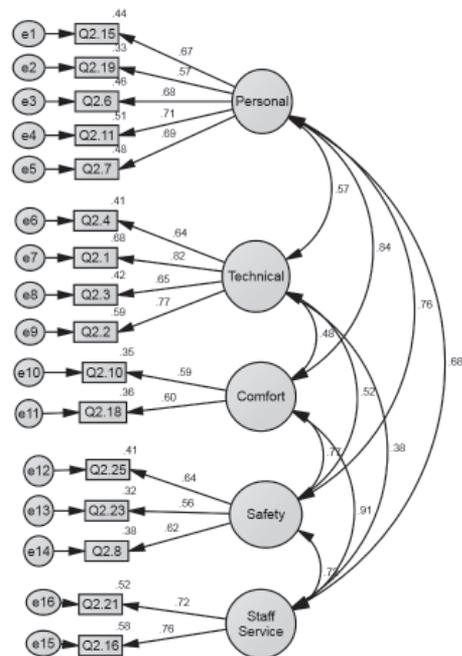


Figure 4.1 : First Order Measurement Model



**Table 4.4.3.1** : Results of the confirmatory factor analysis – Model fit

Chi-square	df	p	CMIN/df	CFI	RMSEA
293.150	120	.000	2.443	.905	.069

These results reveal that all the pre-requisites for the acceptance of the model are nearly met. The following table gives the unstandardized and standardized estimates of various regression models and their significance involved in the structural model.

**Table 4.5** Estimates of independent factors in the model

Relationships	Estimate	S.E.	Standardized estimate	C.R.	P	R <sup>2</sup>	Significance
<b>Technical</b> <--- Bank	-0.785	0.102	-0.528	-7.729	***	0.279	Significant
<b>Personal</b> <--- Bank	-0.054	0.118	-0.032	-0.461	0.645	0.324	NS
<--- Technical	0.624	0.105	0.551	5.915	***		Significant
<b>Safety</b> <--- Personal	0.693	0.111	0.755	6.268	***	0.589	Significant
<--- Bank	-0.059	0.114	-0.038	-0.513	0.608		NS
<b>Staff Service</b> <--- Personal	0.309	0.213	0.238	1.448	0.148	0.578	NS
<--- Safety	0.689	0.27	0.487	2.552	0.011		Significant
<--- Bank	-0.386	0.141	-0.177	-2.744	0.006		Significant
<b>Comfort</b> <--- Personal	0.385	0.117	0.396	3.286	0.001	0.92	Significant
<--- Staff Service	0.476	0.104	0.636	4.575	***		Significant
<--- Bank	-0.046	0.116	-0.028	-0.396	0.692		NS
<b>Satisfaction</b> <--- Comfort	-2.039	3.161	-1.553	-0.645	0.519	0.766	NS
<--- Staff Service	0.947	1.559	0.964	0.608	0.544		NS
<--- Safety	0.343	0.221	0.246	1.552	0.121		NS
<--- Technical	-0.281	0.107	-0.195	-2.636	0.008		Significant
<--- Personal	1.619	1.242	1.269	1.304	0.192		NS
<--- Bank	-0.16	0.284	-0.075	-0.564	0.573		NS

S.E. : Standard error; C.R : Critical Ratio; P : Probability value; R<sup>2</sup> : R-squared; NS: Not significant  
Significant relationships are identified at 5% level of significance.

It can be seen from the above table that some of the relationships are significant. *i.e.*, relationships between Name of Bank and Technical / Staff Service factors have negative coefficients; relationships between Technical and personal factors, Safety and Staff Service have positive coefficients; relationship between Technical factor and Satisfaction has a negative coefficient. The negative coefficients imply that the concerned factors are inversely related to one another. It can also be observed from the

above table that the factor ‘Comfort’ has been well explained by the factors Personal and Staff service, as 92% of variation in comfort is explained by these two factors. Hence the structural model was developed with ‘comfort’ as mediating factor and overall satisfaction as the end variable. The end variable customer satisfaction measured through a straight question ‘overall satisfaction’ shows that around 77% of its variation is explained by the model, with only one significant contributory factor ‘Technical’ with

negative coefficient. However, the direct and indirect effects of different factors involved in explaining customer satisfaction

were further analyzed to arrive at an in depth conclusion.

**Table 4.6 :** Standardized effects of contributing factors

Standardized Total Effects (Group number 1 - Default model)						
	Bank	Technical	Personal	Safety	Staff Service	Comfort
Technical	-0.528	0	0	0	0	0
Personal	-0.323	0.551	0	0	0	0
Safety	-0.282	0.416	0.755	0	0	0
Staff Service	-0.391	0.334	0.605	0.487	0	0
Comfort	-0.405	0.431	0.781	0.31	0.636	0
<b>Satisfaction</b>	-0.200	0.261	0.826	0.235	-0.024	-1.553
Standardized Direct Effects (Group number 1 - Default model)						
	Bank	Technical	Personal	Safety	Staff Service	Comfort
Technical	-0.528	0	0	0	0	0
Personal	-0.032	0.551	0	0	0	0
Safety	-0.038	0	0.755	0	0	0
Staff Service	-0.177	0	0.238	0.487	0	0
Comfort	-0.028	0	0.396	0	0.636	0
<b>Satisfaction</b>	-0.075	-0.195	1.269	0.246	0.964	-1.553
Standardized Indirect Effects (Group number 1 - Default model)						
	Bank	Technical	Personal	Safety	Staff Service	Comfort
Technical	0	0	0	0	0	0
Personal	-0.291	0	0	0	0	0
Safety	-0.244	0.416	0	0	0	0
Staff Service	-0.214	0.334	0.367	0	0	0
Comfort	-0.377	0.431	0.385	0.310	0	0
<b>Satisfaction</b>	-0.125	0.455	-0.443	-0.011	-0.988	0

It can be seen from the above table that the factor Bank has negative total effect on almost all the factors. Lakshmi Vilas Bank, being coded as '1' in the data preparation, implies that the services of LVB are better than SBI in all the contributing factors of satisfaction. The

negative coefficient in the total effect - 0.528 means that LVB is well ahead of SBI in technical factor (*Pamphlets/ statements are virtually appealing, Banks fulfils its promises at the time indicated, Distance to the office (premises) of the bank, Bank staffs have*

the knowledge to answer). This is achieved by LVB despite the fact that SBI has more number of branches SBI in the district than LVB. The model for overall satisfaction explained by the contributory factors can be expressed by the regression model Satisfaction = -0.200 + 0.262 (Technical) + 0.826 (Personal) + 0.235 (Safety) – 0.02 (Staff Service) – 1.553 (Comfort). From this equation it can be inferred that the factors Staff service and comfort have an inverse relationship with the explained variable Satisfaction. The variable Technical has a positive indirect effect, the variable Personal has a positive direct effect, but however it has little bit of indirect effect also; the variable Safety has a positive direct effect and the variable Staff Service has a positive direct effect. But the factor comfort has a strong indirect

effect on satisfaction. Hence it is suggested that the banks have to pay more attention to the customers to make them more comfortable by way of offering flexible service timings and assisting customers to meet their requirements. Also it can be seen from the table that there is positive direct path between Staff service and Comfort (.636), meaning if the Staff service is good, the customers will feel comfortable. Further, there is positive direct path between safety and personal (.755) implying that if the customers are given personal care, they feel they are secured.

The various hypotheses set in the model are tested for their validity and the result is reproduced in the following table 4.4.3.4:

**Table 4.7:** Hypothesis testing of factors in the model

Factors		Hypothesis	P	R <sup>2</sup>	Inference
<b>Technical</b>	<--- Bank	The factor Bank does not have any impact on the 'Technical' factor	<.001	0.279	Rejected
<b>Personal</b>	<--- Bank	Bank does not have any impact on 'Personal'	0.645	0.324	Not rejected
	<--- Technical	Technical does not have any impact on 'Personal'	<.001		Rejected
<b>Safety</b>	<--- Personal	Personal does not have any impact on 'Safety'	<.001	0.589	Rejected
	<--- Bank	Bank does not have any impact on 'Safety'	0.608		Not rejected
<b>Staff Service</b>	<--- Personal	Personal does not have any impact on 'staff service'	0.148	0.578	Not rejected
	<--- Safety	Safety does not have any impact on 'staff service'	0.011		Rejected
	<--- Bank	Bank does not have any impact on 'staff service'	0.006		Rejected
<b>Comfort</b>	<--- Personal	Personal does not have any impact on 'comfort'	0.001	0.92	Rejected
	<--- Staff Service	Staff service does not have any impact on 'comfort'	<.001		Rejected
	<--- Bank	Bank does not have any impact on 'comfort'	0.692		Not rejected
<b>Satisfaction</b>	<--- Comfort	Comfort does not have any impact on 'satisfaction'	0.519	0.766	Not rejected
	<--- Staff Service	Staff service does not have any impact on 'satisfaction'	0.544		Not rejected
	<--- Safety	Safety does not have any impact on 'satisfaction'	0.121		Not rejected
	<--- Technical	Technical does not have any impact on 'satisfaction'	0.008		Rejected
	<--- Personal	Personal does not have any impact on 'satisfaction'	0.192		Not rejected
	<--- Bank	Bank does not have any impact on 'satisfaction'	0.573		Not rejected

It can be seen from the above table that bank has an impact on the factors Technical and Staff service. The factor 'Technical' has significant contribution to the factor 'Personal' and overall satisfaction. The factor 'personal' has a significant influence on the factors 'Safety' and 'Comfort'. The factor 'safety' is significantly influencing 'staff service'.

### **Conclusion**

The main aim of the study was to examine the level of satisfaction of customers on various banking services offered by Lakshmi Vilas Bank and other nationalized banks in Tiruchengode taluk. The sample customers across three different resident areas, viz. rural, semi-urban and urban areas comprising of 300 numbers were studying by issuing a questionnaire on 26 items of services and the data was gathered. The principal component analysis was used to reduce the 26 items which were finally reduced to four main components of service namely Personal, Comfort, Technical and Staff Service. A model was developed for measuring the contributory level of these factors to customer customers and tested for validity through Structural equation modeling.

The results revealed that about 77 per cent of the variations in customer satisfaction was explained by these four factors and within these four factors, several of them were leading to contribute much to the factor 'comfort'. It is derived from the analysis that the banks should

concentrate to improve the comfort level of their customers to raise the overall satisfaction which will ultimately lead to increase in business volume and thereby will result in more profit. It is concluded through this study that the overall satisfaction level on various banking services of LVB is better than other nationalized banks in Tiruchengode taluk.

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# Assessment of Technologies for Discoms in NCR and Development of Power Distribution Technology Implementation Index

**Vipin Khurana**

Associate Professor & Area Coordinator (QT) IBS Business School, Gurgaon

**Varun Prakash**

Sr Manager, BSES Rajdhani Power Limited (Reliance Energy)  
vpdreams2002@gmail.com

**ORS Rao**

Vice Chancellor, ICFAI University, Jharkhand

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## ABSTRACT

*Power distribution system acts as a bridge between the customers and the utility. With changing times, the consumers expectation is not power supply to them but a reliable and quality power supply with timely redressal of complaints. With advent of IT, and mobile technologies changing of our lives, consumers expects the utilities with accurate metering and billing free from any errors with facilities like online payment of bills and from mobile applications. All of these can be possible only by adopting innovative and smarter technologies to curb human intervention and provide better services to the consumers in terms of handling complains and automate the consumer's redressal mechanism. IT and associated technologies also address in solving energy audit issues and identification of more problematic areas and which needs more focus and attention.*

*The paper tries to assess the level of technologies implementation in power distribution companies in National Capital Region and proposes a power distribution Technology Index.*

## Literature Review

MP Gupta (2007) et all empirically assessed the level of IT use in government organizations, and study the role of top management, IT management, user satisfaction, organizational culture, and IT use through descriptive and inferential statistics.

Meeta Dasgupta (2011) tried to bring together different aspects of

technological innovation and technology strategy at North Delhi Power Ltd, Delhi which has taken various initiatives to turnaround the dilapidated power distribution industry in India. It details the various technological initiatives taken by the company to revamp the power distribution situation of the country.

Hiroshi Kashiwazaki et.al (2002)

elaborates New Technologies for Electric Power Distribution Systems, the intelligent substations applying IT (information technology) and system configurations aimed at high-speed communication. , with the incorporation of needs for the future intelligent control of substations, protection, monitoring, and communication systems that have advantages in terms of high performance, functional distribution, information-sharing and integrated power distribution management.

Kam-Hoong Cheong in his thesis on IT Strategy for utilities did extensive study on existing IT strategies within electric utilities, mostly formulated with the traditional mind-set of the industrial-age that focused primarily on technology, is inadequate and ineffective in dealing with today's IT which has a broader implication on an organization's business activities. In order to enhance the effectiveness of future IT strategy, a framework that adopts a system approach is proposed in this thesis.

P.V.Chopade B.E.Kushare Dr. D.G.Bharadwaj discusses Information Technology Solution for Power Distribution System Automation, provided IT solution which will enable the business operation at the transaction level and improve the overall quality in Decision Support System. Information Technology (IT) would thus become the foundation for sustainable reforms.

R. P. Gupta and S. C. Srivastava (2007), described the indigenous development and implementation of a

Power Distribution Automation system at pilot level in Indian Institute of Technology (IIT) Kanpur, India. Electric Power Distribution Automation (DA) system is being increasingly adopted by the electric utilities to reduce the operational problems of distribution networks.

Aurobinda Basu, Surajit Banerjee, Gautam Banerjee(2006) focuses on Reduction in T&D Losses in CESC by IT based Surveillance focuses on various IT based initiatives which had led to reduction of T&D losses in Kolkata.

K V Ravithran (1999) talks about the ,Power system of Kerala techno economic analysis, analyses the trends in supply and demand variable affecting the power system and power system efficiency of the state in terms of load factor , demand factor transmission and distribution network and tariff structure.

United Energy (2013), a Victorian power distribution Company in Melbourne , in its Distribution annual Planning Report, elaborates the company strategy in effective utilization of various technologies like GIS,SAP,SCADA,AMI etc for better services to the customers and increasing efficiency of the organization .

Robinson (2013) has effectively tries to gives the brief idea regarding the impact of electricity on economic status of people in Delhi and effectiveness of Delhi Electricity Regulatory Commission (DERC) regulation for annual/multiyear tariff rates calculation.

## Research Objective

To empirically evaluate the status of technology implementation among the power distribution companies by developing a comprehensive index, viz., Power Distribution Technology Index (PDTI). The paper also tries to find out correlation between the AT&C losses incurred by the power utilities over the years and automation and information technologies they have implemented in improving their system.

## Hypothesis

The through literature review of technologies used by Discoms in India as well as over the world and interaction with Discom officials at various forums and meetings led to formulation of hypothesis. The hypothesis are as follows:

Ho1- There is no difference in level of technology implementation in power distribution companies.

Ho2: There is no correlation between technology implementation index & AT&C loss of power distribution companies.

## Research Techniques Used

The tools and techniques used in this study is mixed mode approach was adopted including qualitative analysis and grounded theory which is one of the well known qualitative analysis techniques has been used in this research. Along with grounded theory of research, few simple quantitative methods too has been used to develop technology index.

## Grounded Theory

“Grounded Theory is the study of a concept! It is not a descriptive study of a descriptive problem” (Glaser, 2010). “Most grounded theorists believe they are theorizing about how the world is rather than how respondents see it” (Steve Borgatti).

A grounded theory design is a systematic, qualitative procedure used to generate a theory that explains, at a broad conceptual level, a process, an action, or an interaction about a substantive topic (Creswell, 2008). The phrase “grounded theory” refers to theory that is developed inductively from a corpus of data. “Grounded Theory is the most common, widely used, and populer analytic technic in qualitative analysis” (the evidence is: the number of book published on it) (Gibbs, 2010). It is mainly used for qualitative research, but is also applicable to other data (e.g., quantitative data; Glaser, 1967, chapter VIII).

The basic idea of the grounded theory approach is to read a textual database and “discover” or label variables (called categories, concepts and properties) and their interrelationships.

The data do not have to be literally textual- they could be observations of behavior. Often they are in the form of field notes, which are like diary entries.

Types of data collections :

- Interviews
- Observations
- Documents

- Historical Records
- Vidoetapes

The data collection was basically in two forms:

**Primary Data collection:** The methods of data collection were basically in form of survey, focused and unstructured interview. The researcher made use of various forums, seminars and workshop

for conducting interviews and collect the data from the Discoms officials.

**Secondary Data Collection:** The secondary data collection mainly comprised regulatory and audit reports, information from Discoms websites etc,

Summary of primary and secondary data referred are as follows:

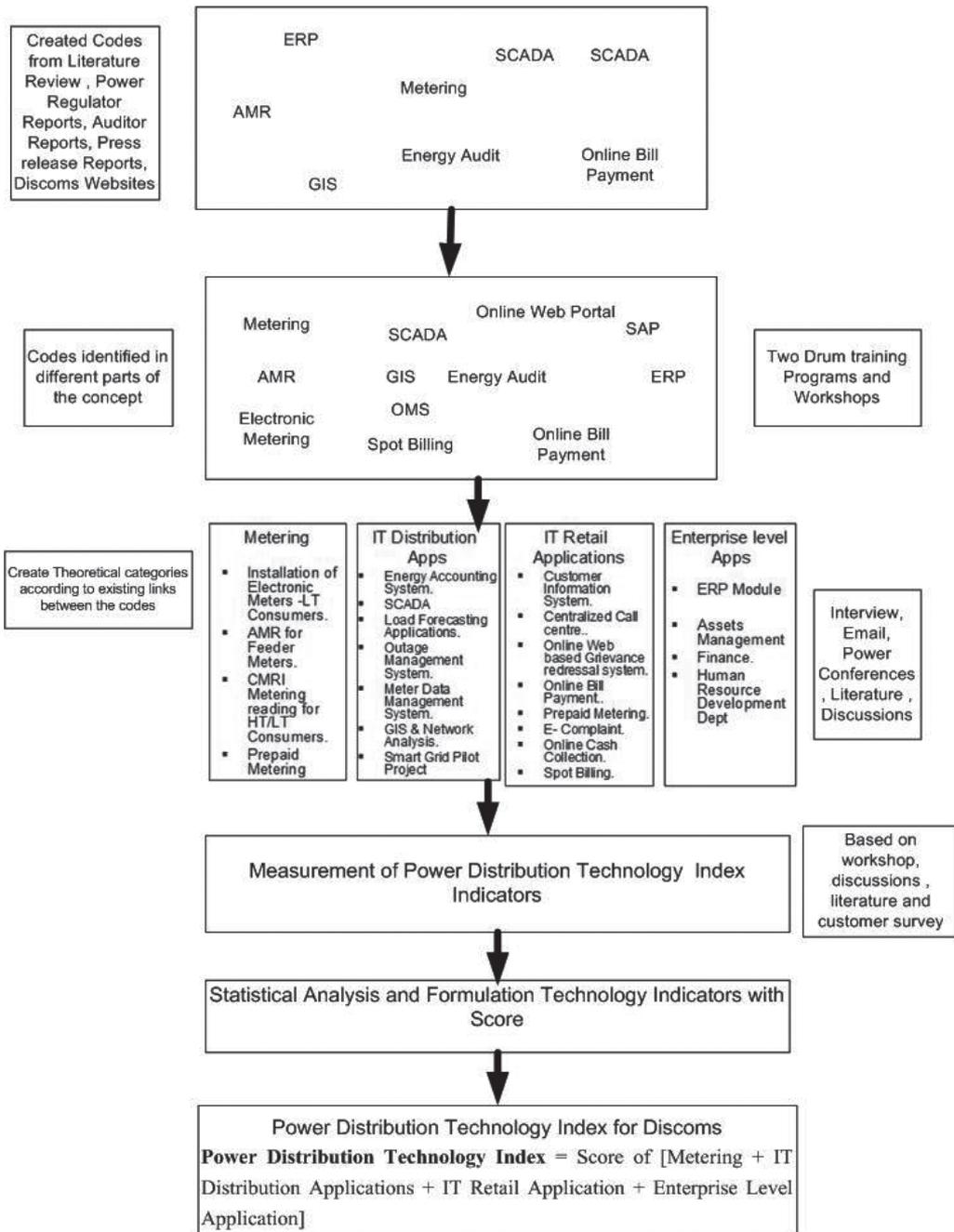
**Table 3.** Summary of sources of data collection

Sl No	Factors Considered for Technology Implementation Index	Details	Nos
1	Utility Customers Survey	No. Customers Surveyed	300
2	Utility Energy Audit Reports	No. of Audits Reports Referred	21
3	Discoms Reports Shared with Power Regulator	No. of Discoms Report	15
4	MOP Reports	No. of Ministry of Power Reports Referred	12
5	Inputs from Customer Care Dept and Helpline No		
6	Utility Website	Websites of Power Distribution Companies	7
7	Press Release & Power Market News	No. of Press Released referred	35
8	Interview with Power Utility Officials	No. of Utility Officials Interviewed	45

The author made use of MOP DRUM training program where Haryana Discoms officials came to BSES for training. The author conducted semi structure interview with Haryana Discoms officials about various technologies being currently used and technology which are at different stages of implementation. The workshop

and DRUM training program interaction and semi structured interview helped in grouping of ideas and concepts .

Codes identified during earlier workshops facilitated by *constant comparison* between data from participants from the Discoms , data and category, category and other categories.



**Fig 3.** Dissertation logic scheme based explanation of obtaining the grounded theory (source: created by the author)

## Power Distribution Technology Index (PDTI)

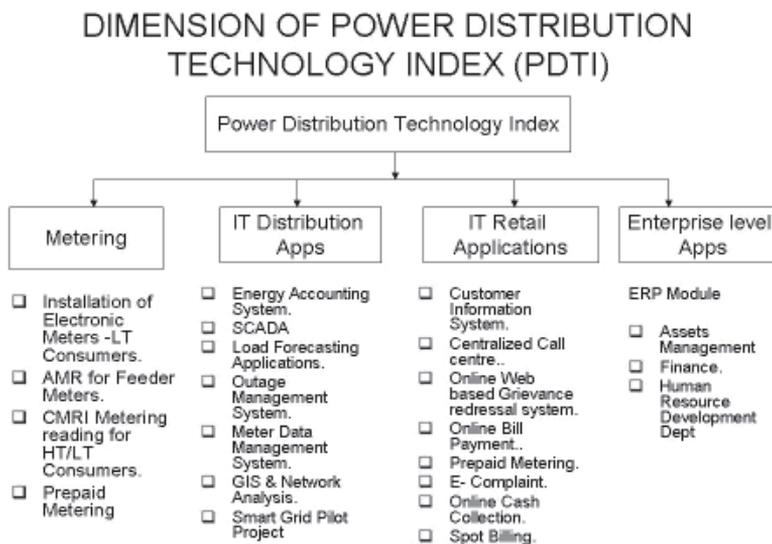
Measuring multiple dimensions of IT & an automation technology in Power distribution sector is indispensable in understanding its components, benchmarking success, and catalyzing improvement. While there have been some laudable efforts to measure wellbeing, these capture only limited aspects of technology implementation in power utility sector, and are uneven in breadth and scope across different utilities in Indian Power Sector scenario.

Power Distribution Technology Index (PDTI) is a tool designed to comprehensively measure and track the level of Information Technology (IT) and automation technologies implementation in power distribution companies. The research area currently is National Capital

Region of India. The instrument designed can be used a powerful tool to measure the success and failures of different which are being implemented in power distribution sector.

The research focuses on development of Power Distribution Technology Index (PDTI) is to provide a rigorous tool to benchmark technology adoption and diffusion within utilities. Power Distribution Technology Index depends on the policy choices, investments, and implementation capabilities of multiple stakeholders—mainly utility, government, civil society, and business.

The overall definition can be disaggregated into various dimensions of Power Distribution Technology Index that define the basic architecture of the model which has been defined below:



**Fig 1.** Dimensions of Power Distribution Technology Index grouped by Researchers

### **Dimension of Power Distribution Technology Index (PDTI)**

The four dimensions of the of Power Distribution Technology Index roughly mirror of the progression of contemporary technologies which are being implemented in achieving automation and increasing efficiency for better customer satisfaction.

The first dimension captures the degree to level of implementation of different types of metering technologies which are the most essential part for any Power distribution company. The current scenario has witnessed the major sea change transformation in metering from mechanical meters to current prepaid meters just as we do pre paid recharge in our mobiles. The Metering technologies discussed in the research are divided into four components:

- Installation of Electronic Meters -LT Consumers.
- AMR for HT Consumers.
- AMR for Feeder Meters.
- CMRI Metering reading for HT/LT Consumers.
- Prepaid Metering

The second dimension of Power Distribution Technology Index captures the degree to which a power utility has implemented IT (Information Technology) to address its various needs and developing Power Distribution applications. IT Distribution Apps are divided into following major components:

- Energy Accounting System.

- SCADA
- Load Forecasting Applications.
- Outage Management System.
- Meter Data Management System.
- GIS & Network Analysis.
- Smart Grid Pilot Project

The third dimension IT Retails Application confine the level customers are able to get in touch with power distribution company for their various issues . This dimensions exhibits initiatives and ways developed by power utility to reach its consumers and how IT applications can help in solving its various issues.

The IT Retails Applications dimension is divided into the following components:

- Customer Information System.
- Centralized Call centre..
- Online Web based Grievance redressal system.
- Online Bill Payment..
- Prepaid Metering.
- E- Complaint.
- Online Cash Collection.
- Spot Billing.

The fourth dimension Enterprise Level Apps mainly arrests the degree to which power utility has implemented SAP Module or any other similar modules in assets management and its human resource details.

The Enterprise Level Applications dimension is divided into the following two components:

- Assets Management

- Finance
- Human Resource Development Dept.
- Performance Management System

The Power Distribution Technology Index provides the platform to assemble sets of technology implementation

It lets each power distribution companies to discover explicit areas of strength or weak point in context to technology being implemented and executed by them, as well as to benchmark themselves against peer power distribution.

The Power Distribution Technology Index is designed based on extensive research on technologies being

implemented by power utilities and quantify in depth each components and dimensions which leads to overall score of utilities. As mentioned the Index spotlights on indicators of technology implementation results; rather than measuring inputs, the Power Distribution Technology Index focuses on what level of technology progress has already been achieved within a power utility.

The four different dimensions of the model—Metering Technologies, IT Distribution Apps, IT Retail Applications and Enterprise level Applications —are assigned weighted in the overall index and sum of the four components which are

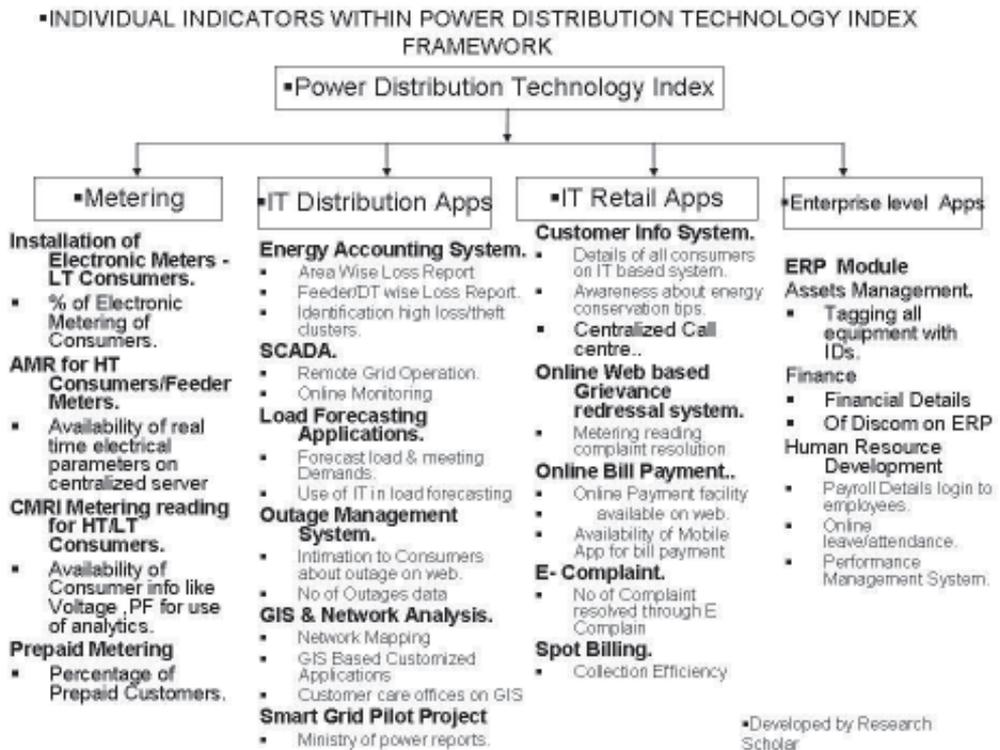


Fig 2. Power Distribution Technology Index with Indicators

being weighted differently gives the clear picture of each dimensions . Finally score is developed for different power distribution companies calculated using methods discussed in Research Design and methodology section.

**Measuring Individual Components**

Each technology identified in the research which has been used by the power Discoms are well defined in order to measure the level of technology implementation. The measurement of the technology implementation is being done using indicators against each technology.

Category	Technologies	Indicators	Definition
Metering	Installation of Electronic Meters -LT Consumers	Reduction of AT&C Losses.	Decrease in AT&C losses over the years
		100 % Metering of Consumers. Increase in electricity consumption	% People having electronic meters
	AMR for Feeder Meters	Availability of real time electrical parameters on web	Automated capturing & monitoring of data from Meter
	Prepaid Metering	% of prepaid meters installed in the Discoms	Total no of prepaid consumers by total consumers
IT Distribution Apps	Energy Accounting System	Area Wise Loss Report	Divisionwise/Circlewise loss report
		Feeder/DT wise Loss Report.	DT wise Loss Report.(Year)/Chapter)
		Identification high loss/theft clusters	Use of energy accounting system to identify areas/pockets with high losses
	SCADA	Remote Grid Operation.	Manless Grids of Discom
		Online Monitoring	Centralized SCADA Centre
	Load Forecasting Applications	Use of IT in forecasting load	Load Forecasting application is being done using software or application
	Meter Data Management System	Existence of analytics based Reports	Prevention of theft & various reports based on data collected from meters by use of analytics
	Outage Management System	Intimation to Consumers about outage on web.	Providing accurate Information on the extent of outages and number of customers affected.
		Outage Data History/Causes	Identifying the location of fuse(s) or breaker(s) that operated to interrupt a circuit or portion of a circuit
		No of Outages data	Data Availability of no of outage area wise per day on software application .
	Geographical Information System & Network Analysis	Network Mapping	Network Maps availability on website
		GIS Based customized applications	Availability of customized GIS Applications
		Customer care offices on GIS	Mapping of Discom Offices.
	Smart Grid Pilot Project	Ministry of power reports.	
Customer Information System	Centralized Call Centre	Time Taken for new Connection /Details of all consumers in IT system	Discom maintains all consumers details in IT module / Time taken to new connection from Discom
		Awareness about energy conservation tips	Awareness among consumers to save electricity and reduce their bills.
	Centralized Call Centre	Round the clock customer care No	Availability of Customer care no which is available round the clock

IT Retail Applications	Online Bill payment	A	Various types of Bill payment options on website of Discom
		Availability of Mobile App for Bill Payment	Availability of Mobile App on play store for payment facility
	E Complaint	No of Complaint resolved through E Complaint	
	Spot Billing	Collection Efficiency	Consumers gets bill at spot when meter comes in his home to take reading
Enterprise level Apps	ERP Module for Finance	ERP Module implementation for Finance Dept	Financial Details Of Discom on ERP
	ERP Module for HR	Payroll Details login to employees.	Payroll details of all employees are in ERP
	ERP Module for HR	Online leave/attendance	Employees attendance management system is through ERP
	Performance Management System of employees	Appraisal and Performance of Employees using ERP Software	ERP platform is being used for appraisal system
	ERP for Assets Management	Tagging all equipment with IDs.	All Discom Assets are maintained in ERP

**Table 2.** The individual indicators within the Power Distribution Technology Index Framework

## Data Analysis

### Calculation of Power distribution Technology Index (PDTI)

Based on the data primary data collected by the researcher and also information derived from the secondary sources of information, technologies in each category has been assigned a marks out of 5 which helps in judging the level of technology implantation in the Discoms.

### Formula for Power Distribution Technology Index

Power Distribution technology index is an indicator of extend of the technologies being used by the Discoms and also how

this has helped in reducing their operational efficiency.

Total Technology Score = Summation of Individual Technology Scores of Discoms

Power Distribution Technology Index of Discom = Summation of (Weights \* Individual Technology Indicators Score)

**Power Distribution Technology Index** = Score of [Metering + IT Distribution Applications + IT Retail Application + Enterprise Level Application]

The table below shows the different technologies taken up for study and their individual scores and weights-

Sl	Category	Technologies	Total Score	Weights	Avg Score (Delhi)	Avg Score (Haryana Discom)	Delhi Weighted Score	Haryana Weighted Score
1	Metering	Installation of Electronic Meters -LT Consumers	5	0.4	4	4	1.6	1.6
		AMR for Feeder Meters	5	0.05	4	3	0.2	0.15
		Prepaid Metering	5	0.05	4	1	0.2	0.05
		Energy Accounting System	5		5	2	0.75	0.3
		SCADA	5		5	1	0.75	0.15

2	IT Distribution Apps	Load Forecasting Applications	5	0.15	4	1	0.6	0.15
		Meter Data Management System	5		5	1	0.75	0.15
		Outage Management System	5		5	1	0.75	0.15
		Geographical Information System & Network Analysis	5		5	2	0.75	0.3
		Smart Grid Pilot Project	5		1	0	0.15	0
3	IT Retail Applications	Customer Information System	5	0.2	5	4	1	0.8
		Centralized Call Centre	5		5	3	1	0.6
		Online Bill payment	5		5	4	1	0.8
		E Complaint	5		4	3	0.8	0.6
		Mobile Apps	5		4	1	0.8	0.3
		Spot Billing	5		5	4	1	0.8
		ERP Module for Finance	5		5	1	0.75	0.15
		ERP Module for HR	5		4	1	0.6	0.15
4	Enterprise level Apps	Performance Management System of employees	5	0.15	5	1	0.75	0.15
		ERP for Assets Management	5		5	1	0.75	0.2
			100	1	89	39	14.95	7.55

**Table No 4.** Discoms Power Distribution Technology Index Score

Category	Total	Delhi	Haryana	Delhi %	Haryana %
Metering	15	12	8	80	67
IT Distribution Apps	35	30	8	86	27
IT Retail Apps	30	28	18	93	64
Enterprise Level Apps	20	19	4	95	21
	100	89	38		

**Table 5.** Scores of individual technology of Discoms

### Relation of Power Distribution Technology Index and AT&C losses

After evaluation of technologies being used by power distribution companies using power distribution technology index, researcher tried to find out whether there is any relation between AT&C losses

incurred by Discoms and level of technologies being implemented.

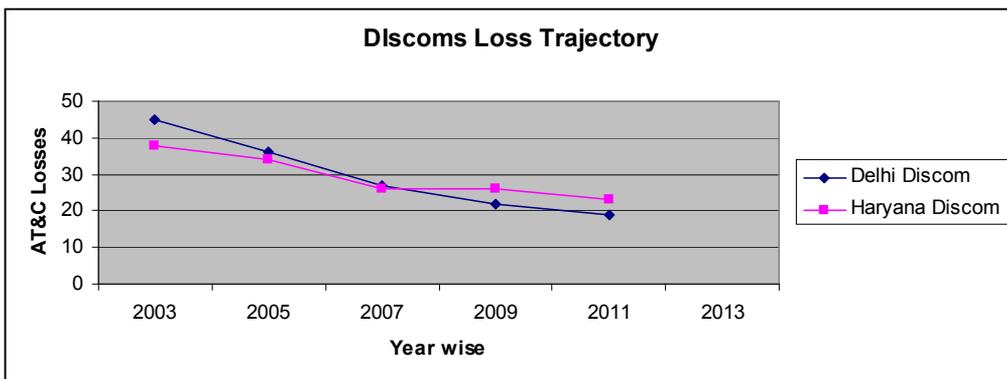
The loss figures of the Discoms and their technology index is shown in the figure below:

		AT & C Losses					
DISCOM	Technology Index	2003	2005	2007	2009	2011	2013
Delhi Discom	22	45	36	27	22	19	
Haryana Discom	10	38	34	26	26	23	

Source AT&C Loss: Ministry of Power Reports

**Table 7.** Loss Trends of Discoms with Technology Index

The figures shows below the Discoms loss trajectory with respect to years which also be compared with the technologies index computed for these Discoms.



**Fig 4.** Discoms Loss Trajectory

## Conclusion

The power distribution utilities in India are have already implemented few IT and automation technologies and the rest are in the different stages of implementation of these technologies. Based on the data collected through survey and interviews and further analysis the results were derived, there is difference in level of technology implementation in power distribution companies. The power distribution technology index is a clear indicator of

technology implementation in Discoms which clearly shows PPP Discoms score better than Govt Discoms in National Capital region. If we closely look at AT&C losses at these Discoms we can clearly see Discoms with higher index have been able to reduce their AT&C losses as well. But if observe at the loss levels of the both Discoms there is not much difference in loss level but huge gap in terms modern technology implementation in both Discoms.

One of the key outcomes of the research which gives answer to AT&C losses and technology was Metering. Metering for all and replacement of electronic meters from mechanical meters increase income of the Discoms and which substantially led to lowering of the AT&C Losses. Metering for all initiative and conversion of mechanical meters to electronic meters brought down AT&C level drastically in 2003-2005, the loss levels from 45% to 36%. Implementation of Information Technology cannot be directly responsible for drastic reduction in AT&C losses. Technology takes its own time for acceptance among users and brings affects on AT&C losses. AT&C depends directly on many factors & especially commercial losses & social economic conditions where sometimes technology has to play little role. Information Technology implementation in billing also led to increase billing efficiency of the Discoms which in turn led to reduction of AT&C losses.

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## **Impact of Packaging on Consumers' Buying Behaviour: A Case Study of Mother Dairy, Kolkata**

**Bidyut Kumar Ghosh**

Chinsurah, Hooghly (WB),

bidyutbwn@gmail.com

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### **ABSTRACT**

*This study seeks to examine the impact and role of product packaging on the buying behaviour of consumers for the dairy of products of government owned Mother Dairy. It has been observed that packaging elements such as color, background image, wrapper design and innovative ideas, have significant impact on consumers' buying behaviour. The study also makes the conclusion that the visual appeal is more important than the qualitative aspect of packaging in the study area. In the case of Mother Dairy, the quality of materials used in packaging and the information printed on packaging of the products, do not have any significant bearings on the consumers.*

**Keyword:** *Packaging, consumer behaviour, sales promotion.*

### **Introduction**

In the fiercely competitive market, aesthetic elements of packaging have occupied an important and unique position in delivering the product/service to the end users. It has become important tool of differentiating the product/service from the similar kinds of products/services available in the market (Wells, 2007). Rundh (Rundh, 2005) has clearly observed that the packaging attracts consumers' attention to particular brand, packaging enhances the product image and influences consumers' perception about the product or service. The appearance of the package is believed to have a strong impact on influencing consumers' purchase decision than advertising (Mutsikiwa and Marumbwa,

2013). Givee (Givee, 2011) have established that an appealing and successful packaging design with relevant design, pictures and decorations is more successful in attracting consumers. However, an obvious question arises that does this phenomenon applies to all categories of product and services, viz. daily necessities, luxuries commodities, cosmetics products, food items etc. Moreover, though there is abundance of literature on this particular issue in general, there is dearth of quality literature on the issue of role of packaging particularly in the dairy products on the consumers' purchasing decisions. Under this backdrop, this paper tries to examine the following specific objectives:

- i. to determine the effect of package colour on consumers' purchase decision;
- ii. to examine the effect of background image used in packaging on consumers' purchase decision;
- iii. to examine the impact of packaging materials on the consumers' purchase decision;
- iv. to examine the influence of products package typography on consumers' purchase decision; and
- v. to examine the impact of information printed on the packaging on consumers' purchase decision.

The present study is planned into five sections. The After the introduction in section I, section II deals with the literature survey of the research problem. Data and methodological aspects of the study are outlined in section III. Section IV consists of results and discussion of the study, while the final section V summarises the conclusion and policy prescription emanating from the overall analysis.

## REVIEW OF LITERATURE

There are numerous literatures available on this particular issue of impact of packaging on consumer purchase decisions. (Kuvykaite, 2001), (Underwood, 2001), (Speece, 2007), (Wells, 2007), (Marumbwa, 2013), (Givee, 2011) to name a few of them. (R.L. Underwood, 2001), (Speece, 2007) have clearly established that packaging has great impact on product marketing as

2004), works as a tool for differentiation, i.e. helps consumers to choose the product from wide range of similar products and thus, stimulates customers buying behaviour.

Garber (L.L. Garber, 2000) has observed that though the package design is an integrated element of the promotional mix, it is also an important carrier of brand equity in the store.

Packaging communicates brand personality through many elements, including a combination of brand logo, colours, fonts, package materials, pictorials, product descriptions, shapes and other elements that provide rich brand associations (Underwood, 2003). A study performed by CM Research (cited in Gautier, 1996, p.37) demonstrated that consumers 'did not consciously believe they were purchasing products because of the packaging alone... There are strong indicators, however, of the subconscious influence of the packaging on the purchasing processes.

While some research was conducted by Wisenblitz (Wisenblitz, 1999) on colour choices with packaging in fast moving consumer goods, they also highlighted the need for more research into colour as a stimulus when they stated that 'colour research in the field of marketing still appears to be in its infancy' (p. 86). Underwood (R.L. Underwood, 2001) highlighted the importance of both colour and packaging as a brand communication vehicle.

The focus of colour as a stimulus is related to its ability to aid companies who are looking for ways to improve their sales and obtain a dominant market share (Kotler, et al. 1998). While some colours have the ability to make goods stand out from their competitors among the clutter of the goods and promotional material at the point of purchase (Heath, 1997, and Key, 2000) other colours do not have this effect (Key, 2000).

## DATA AND METHODOLOGY

The present study is purely based on the primary data collected through the structured questionnaire from the respondents. In total 150 filled questionnaires were collected from the districts of Howrah, Hooghly and Burdwan of the state of West Bengal during the months of June-July, 2015. However, after scrutiny of the data, 18 filled questionnaires were not included in the final study and thus, total number of observations reduces to 132.

Hypothesis I:

$H_0$  :there is no relationship between buying behaviour and packaging colour against

$H_1$  :here is relationship between buying behaviour and packaing colour

Hypothesis II:

$H_0$  :there is no relationship between buying behaviour and background image of packing against

$H_1$  :there is relationship between buying behaviour and background image of packing

The main theoretical framework of this study focuses on the finding of relationship between dependent variable (consumer's decision about buying the dairy products) and independent variables (different elements of packaging such as packaging colour, background image etc.). It is hypothesised that consumer's purchasing decision of dairy products is a function of the different packaging elements. These set of packaging elements either jointly or individually may influence the consumer's purchase decision. Accordingly, the following theoretical framework is sought for.

Consumers' buying behaviour — { packaging colour,  
background image used in packaging,  
quality of packaging materials,  
font style & size in packaging,  
wrapper desing,  
packaging information }

The associations between the dependent variable and independent variable have been analysed individually with the applications of Chi-square test. Accordingly, the following set of hypotheses have been framed keeping in mind the objectives of the study.

*Hypothesis III:*

$H_0$  :there is no relationship between buying behaviour and quality of packaging against

$H_1$  : here is relationship between buying behaviour and quality of packaging

*Hypothesis IV:*

$H_0$  :there is no relationship between buying behaviour and font style of information against

$H_1$  :there is relationship between buying behaviour and fontstyle of information

*Hypothesis V:*

$H_0$  :there is no relationship between buying behaviour and wrapper design against

$H_1$  :there is relationship between buying behaviour and wrapper design

*Hypothesis VI:*

$H_0$  :there is no relationship between buying behaviour and printed information on the pack against

$H_1$  :there is relationship between buying behaviour and printed information on the pack

For the entire hypothesis, the dependent variable is the consumer's purchasing behaviour. The dependent variables are the different elements of packaging viz. Packaging colour, background image used in packaging, quality of packaging materials etc. Each of above mentioned dependent variables was measured by using the 5 points itemized rating type scale ranging from (1) strongly disagree to (5) strongly agree [Likert's Scale].

## RESULTS AND DISCUSSION

Demographic Characteristics of the Respondents: The sex distribution shows

that 69 percent of the respondents were male, while 31 percent were female. The age distribution shows that only 2 percent of the surveyed population belongs to the age group of below 18 years, 37 percent belongs to the age group of 19-35 years, 31 percent belongs to the age group 36-50 years, 18 percent belongs to the age group of 51-65 years while the age group 66 years and above captures the remaining 12 percent of the sample observations. With respect to occupational standard of the respondents, 43 percent of total respondents were service holders, 27 percent were business and the remaining 30 percent were from others occupation

(students, housewife, etc.). As far as the income levels of the respondents are concerned, it has observed that 44 percent belongs to lowest income category (Less than Rs. 10000 per month). Each of the income categories, Rs. 10000-20000 and Rs. 20000-30000, constitutes 20 percent of the surveyed population while the highest income category (income more than Rs. 30000) constitutes 16 percent of the surveyed population.

Again if we look at the consumption frequency of the surveyed population, it has been observed that 72 percent of them are daily consumers, 8 percent of them consumer milk on alternative day. Another 14 percent of the population is weekly consumers of milk and the rest 6 percent consume milk for other purposes.

#### **Reliability checking of the analysis:**

Any empirical research work should qualify the reliability analysis for checking of the internal consistency of the questionnaire and reliability of the primary data. As such the Cronbah alpha statistic is found to be 0.57 which is quite acceptable.

#### **T-test for Testing the Perception of Packaging in Mother Dairy's Products:**

Firstly, an attempt has been made to assess the customer perception about the packaging of products of Mother Dairy, Kolkata. For this, the respondents have been asked to rate the different products of Mother Dairy on a 5-point Likert scale. The greater the value of the rating, the more is the satisfaction level. Now on a 5-point Likert scale, the median value is 3. So, if a particular consumer rates his satisfaction level 3 or more, it implies that he is satisfied with the packaging of Mother Dairy's products. The following table shows the mean satisfaction levels of different aspects of packaging in Mother Dairy.

It is evident from the results that customers of Mother Dairy is, in general, satisfied in packaging colour, 'background image' of packaging, quality of packaging materials, wrapper design, printed information, packaging innovation. However, they are not satisfied with the typographic style of packaging as the calculated t-value is much higher than the critical t-value and the corresponding p-value is smaller than the level of significance (0.05).

**Table 1:** Tests for the perception of Packaging Mother Dairy's products

Packaging elements	Mean	t-value	df	Sig. level (p-value)
Packaging colour	3.01	2.61	131	0.000
Background image	3.09	1.007	131	0.158
Packaging materials	4.01	10.64	131	0.000
Typographic	2.92	0.928	131	0.822
Wrapper design	3.40	4.178	131	0.000
Printed information	3.84	9.494	131	0.000
Packaging innovation	3.26	2.736	131	0.000

Source: Authors' calculation based on primary data.

Chi-square test for testing the association between Consumer buying behaviour and packaging elements: Having examined the customers' demographic profiles and their perception about the different aspects of product packaging, we are in a posi-

tion to see the degree of association between consumer buying behaviour and packaging elements of products of Mother Dairy, Kolkata. For this purpose, we have used Chi-square test of association. The results are shown in table 2.

Table 2: Chi-square test of association between packaging elements and consumers' buying behaviour.

Variables examined for association	$\chi^2$ - test statistic	Critical value of $\chi^2$	Remarks
Packaging colour and buying behaviour	44.34 (16)	26.29	Null hypothesis is rejected and there is association
background image and buying behaviour	28.76 (16)	26.29	Null hypothesis is rejected and there is association
Packaging materials and buying behaviour	17.59 (16)	26.29	Null hypothesis is accepted and there is association
Font style and buying behaviour	14.97 (16)	26.29	Null hypothesis is accepted and there is association
Wrapper design and buying behaviour	26.29 (12)	21.09	Null hypothesis is rejected and there is association
Printed information and buying behaviour	17.82 (16)	26.29	Null hypothesis is accepted and there is association
Packaging innovation and buying behaviour	56.77 (16)	26.29	Null hypothesis is rejected and there is association

Source: Authors' calculation based on survey data.

The above results show that the independent variable such as packaging colour, background image, wrapper design and packaging innovation have proper association with the dependent variable (i.e., consumer buying behaviour). However, no association has been found in cases of packaging materials, font style and printed information in marketing of dairy products. Therefore, it is evident that if the elements of packaging are improved then the sales of the dairy products may improve to a certain extent.

After finding the association between the dependent variable (consumer buying behaviour) and the set of independent variable, we go for Carl Pearson's correlation test in order to find out to what extent and strength of association between the independent variables and the dependent variable in dairy product packaging. The results of the co-relation analysis is shown in the table below.

**Table 2:** Co-relation between Consumers' buying behaviour and Elements of packaging

Dependent variable	Independent variable	Co-relation Coefficients	t-statistic
Buying behaviour	Packaging colour	0.42	4.33
	background image	0.35	4.26
	Packaging materials	0.11	1.22
	Font size	0.07	0.83
	Wrapper design	0.38	4.66
	Printed Information	0.02	0.26
	Packaging innovation	0.01	0.15

Source: Authors' calculation based on survey data.

It is evident from the above results that packaging colour, background image and wrapper design of dairy product have moderate and significant association with the consumer buying behaviour. However, the other dimensions of packaging such as materials used in packaging, font size, printed information, innovative ideas in packaging etc., and the correlation coefficients were found to be very weak and as such there is no such effects on consumer buying behaviour. Thus, both the Chi-square association test and co-relation study produce the same results as far as packaging of dairy products is concerned and its effects on consumers' buying behaviour.

## CONCLUSION AND SUGGESTIONS

Thus, we find that packaging could be treated as one of the valuable marketing weapons with respect to making proper communication between an organisation and its consumers. The study makes it

clear that the overall perception of the consumers about the different elements of packaging of Mother Dairy's products is satisfactory. A right choice of packaging color, background image, wrapper design, innovative ideas when imparted to a product's packaging will create a happy feeling in consumers' mind. All these packaging elements contribute an important effort to catch consumer's attention and interest. As far as the association between dairy product packaging and impact on consumers' buying behaviour is concerned, it is clear that visual appeal is more important than the qualitative aspect of packaging. This is implied from the significant association between packaging colour, background image, wrapper design and innovation in packaging and the higher positive correlation among these elements of packaging with consumers' buying behaviour, whereas no significant association was observed between

consumers' buying behaviour and quality of materials used in packaging, information printed on packaging etc. and very weak or no correlation among them. The present study also indicates the lacuna of Mother Dairy in terms of packaging its products. However, there are certain areas such as typographic factor in packaging, colour used in packaging, background image where Mother Dairy should give more attention to improve and thereby try to retain the existing consumers and attract new consumers.

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## Knowledge Management Orientation of B-School Processes: A Case Research

**Sanghamitra Brahma**

Heritage Business School, Kolkata (WB)  
brhmdtt@yahoo.com

**Sumita Mishra**

School of Management, KIIT University, Bhubaneswar  
sumita.mishra@ksom.ac.in

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### ABSTRACT

*The purpose of this research article is to understand the awareness and relevance of Knowledge Management (KM) initiatives in the management institutes/ B-Schools affiliated to a state university. The methodology involves semi-structured interviews of 30 senior professors who have worked in different management institutions affiliated to such a state university in West Bengal. The interview transcripts have been analyzed for key phrases/words, categorized, examined for their frequencies. The findings from the study suggest implications for future development in the management education though integration of their key processes with that of Knowledge Management.*

*The integration of Knowledge Management Process with the key academic administration processes in tune with the favourable strategic enablers may lead to benchmarking of the B-School processes that offer degrees affiliated to the state universities.*

**Key Words:** Knowledge Management Implementation, Knowledge Management in B-Schools, Key Strategic Enablers for Knowledge Management

### Introduction:

Management education in India is in crisis. They fail to compete on vital international parameters like research, rankings and accreditation. The mid-tier B-Schools are fighting for their survival with fewer takers for MBA programmes, especially in tier-3 and tier-4 B-Schools, owing to a variety of reasons, like, students' increasing awareness on the quality of education being provided, lack of

infrastructure and faculty in the lower-rung B-Schools, decreasing return on investment (fees), absence of industry tie-ups and collaborations etc.

Drop in interest among students has forced most lower-rung institutes to struggle with low occupancy rates, or in some cases even cease operations. Virtually any graduate can get admission to a B-School. The mid-tier and bottom

tier of management programs which majorly include 3000+ low-cost MBAs offered by public universities and their affiliated colleges, have little direction and relevance. As per CRISIL Research estimates, tier-3 and tier- 4 B-Schools together account for about 85 per cent of

intake capacity of B-Schools in India. However, students clearly are not biting the bullet, as indicated by the slowdown in growth in the last 3-4 years. (Please refer to the Annexure below for understanding the approach to categorizing B-Schools in India.)

<b>Categorization of B-Schools in India</b> (Source: CRISIL Research)				
CRISIL Research has categorized B-Schools in 4 buckets namely Tier-1, Tier-2, Tier-3 Tier-4 based on four parameters.				
Type	Occupancy Rate (in Percent)	Average salary offered (in Lakhs)	No. of students placed (in Percent)	Average Fees (in Lakhs)
Tier-1	95-100	9+	98-100	12-15
Tier-2	80-95	5-9	80-98	8-12
Tier-3	70-80	3-5	60-80	5-8
Tier-4	0-70	0-3	0-60	0-5

*Note: B-Schools have to fulfill the requisite criteria for all four parameters considered in order to fall into a particular bucket. For instance, a business school with a capacity utilization rate of 98%, with 100% of students placed but with an annual average salary package of Rs. 7 lakhs would classify as a tier-2 college and not a tier-1 college.*

In this situation, MBA program admissions are badly affected in the state of West Bengal. A number of colleges have been compelled to shut down their operations in the last five years.

The challenges faced by the B-Schools is further amplified by the evolving role of academics lately in all streams of professional education and training with the rapidly changing dynamics in the national, international and global scenario. Path breaking developments in information and communication technology allows the management/ professional students to avail immense number of scholarly articles within seconds through internet. A large volume of the content is increasingly 'Grey Literature'. There are doubts regarding the

quality of this supply chain of knowledge amidst a 'Tsunami of Intellectual Content'.

Institutional entities, whether for profit or non-profit, like Universities, university-level Autonomous Institutes, publishers for academic content (both physical and virtual) operate the distribution function in academics.

Though a variety of mechanisms are there to control the quality of education, but their adoption in B-Schools is very limited. Apart from those graded in the premium segment in our country, B-Schools are not competent in adopting and implementing the suitable methods and techniques for current quality control in management education and training.

Success of the universities/ academic institutions is contingent on the assumption that they possess relevant expertise, knowledge and skills that the students must learn to emerge as befitting for the real/ business world. The faculty of management education supply chain is tasked with the role of constantly integrating the currently accepted and relevant business doctrines and practices in their curricula. Also, distinguishing 'what is relevant' from 'what is fad' is equally important. Periodic retooling of the various segments of academic programs must be a regular ordeal.

**Knowledge Management Process and Practices (KMPP)** can assist a B-School/ management institute to continuously assess and upgrade its quality by identifying 'what is known and what must be known'. It is fortunate that KM concepts, its mechanisms and their applications which are used to manage organization knowledge and memory are being taught in the classrooms.

But it is unfortunate that the institutions are themselves very slow in adopting these concepts and techniques. For instance, a central premise of KM is knowledge sharing. However, in most academic institutions physical and psychological barriers often hinder effective sharing and transfer of knowledge. As a result there is tremendous lack of cross-disciplinary brain storming and consequent knowledge generation.

KM process implementation in business institutions must begin with initial assessment of the current intellectual capital related to teaching, research and services at distinct levels like individual, departmental and organization as a whole to set the knowledge boundaries. *Effective implementation of KMPPs is ensured by certain strategic enablers (KSE) like supportive Leadership & Governance, conducive Work Culture, IT Infrastructure & System and Integrated Performance Evaluation; and certain individual-level factors like Attitude & Perception.*

Previous academic researchers have looked at implementation of KM and their strategic enablers in higher education institutions (Ramchandran, Chong and Wong, 2013). However, specific research in private, self-funded institutions, affiliated to the state universities which are struggling to survive the crisis of redundancy and how integrated KM may serve as a revival strategy is not evidenced.

### **Literature Review:**

**KM and KM Process in Organizations:** Knowledge is not independent of its knower; it is the result of cognitive processing triggered by the inflow of new stimuli (Fahey and Prusak; 1998). Knowledge is not a radically different concept from information. Rather, information is gradually converted to knowledge when it is processed in the mind of the individuals and knowledge becomes information when it is articulated

and presented in the form of text, graphics, words and other symbolic forms (Schubert et al 1998).

The concept of Knowledge Management has originated in the early 1990s. It was initiated from the difficulty of dealing with complexities, ever increasing competition spurred by technology and the growing sophistication of customers' demands. Polanyi's (1966) discussion on distinction between explicit and tacit knowledge was one of the germinal tasks which led researchers to develop management definitions, concepts, process, stages, circulations and procedures. Drawing on the work of Polanyi (1962-1967), Nonaka (1994) identified two dimensions of knowledge in organizations: tacit and explicit. Tacit knowledge is rooted in action, experience, mental maps, beliefs, paradigms, viewpoints, concrete know-how, crafts and skills etc. that apply to a specific context. The explicit dimension of knowledge is articulated, codified and communicated in symbolic form and/or natural language.

Knowledge Management is a risk with a huge payoff and the risk return balance is the prime condition under consideration. Organization is a Knowledge Field, which is a dynamic synthesis of inherently limited and fragmented bodies of knowledge that comprise its K-inventory. Also, the K-Field is structured and contoured by the emotions and feelings of those who inhabit

it (Spender; 2003). Knowledge based organizations host knowledge management episodes which are triggered by a knowledge need/ opportunity and culminate with the satisfaction of that need (Holsapple & Joshi; 2003). Teece and Pisano (2003) argued that competitive advantage of firms stem from dynamic capabilities rooted in high performance routines operating inside the firms. The collective body of knowledge offered by employees of the organizations has emerged as a key point of differentiation, providing a foundation upon which the quality of products and services can be improved (Balthazard and Cooke, 2004; Jashapara, 2004; Andrade et al., 2003).

#### **Organizational Learning and KM:**

Organization learning is a way to create new knowledge, apply it for a purpose and thereby learn from the process and its outcome. Brown and Duguid (1991) described organization learning as 'the bridge between working and innovating'. The implications of organization learning on KM involve creation of an ideal learning environment, awareness about how and why something has been learned and usefulness of the new learning to the organization.

Peter Senge (1990) argues that often failure provides richest learning experience to the organizations. He criticizes the way we reward success and look upon failure can be detrimental to the long term health of the organization. Levitt and March (1996) discusses superstitious learning

where positive or negative results are associated with the wrong results. Real organization learning results from examination of the information generated from their actions rather than the relatively arbitrary success or failure criteria. There are two approaches to organization learning, namely, cognitive perspective that examines the entire firm's learning as a whole and community based perspective where firm's practitioners create knowledge in their own networks called Communities of Practice (Lave & Wenger; 1991). These two views are complimentary and not contradictory.

### **KM Systems (KMS):**

Systems designed to support knowledge in organizations may not appear radically different from the standard information systems, but they enable users to assimilate information into knowledge. KM is becoming a research priority for the academic community (Salmador and Bueno, 2007) and companies are allocating a greater share of spending for its implementation (Beijerse, 1999; Call, 2005). A KMS is distinct from transaction processing systems (TPS), decision support systems (DSS) or executive information systems (EIS) because of its main mission is to transform experiences into explicit knowledge within the organization. Experience is important and critical part of a KMS (Nonaka, 1994) because when individuals receive new information, the information is processed in light of one's past experience to develop

and create new knowledge (Prahalad and Hammel, 1990); in better words it connects the past to the present (Davenport and Prusak, 2000).

### **Influence of KMPP on the KSE in the Academic Setting:**

The academic institutions *work culture* is often resistant to learning. Researchers have found that even in firms that embrace innovation and recognize the importance of managing knowledge may take years at times to share and adopt certain 'best practices' (Szulanski, 1996). Instead of considering knowledge as an asset whose value increases only when shared, most faculty members consider knowledge as proprietary and is not to be shared freely (Wind and Main, 1999). Lack of intra-organizational relationships like hall talks and social networks to support formal and informal mechanisms needed for knowledge sharing becomes a barrier (Szulanski, 1996). *Leadership* is the cardinal thread that runs through the whole gamut of KM initiatives in an organization. In every organization leaders have a direct impact on how companies should approach and deal KM processes and practices. KM programs can be effective only when they permeate to all levels in the organization, beginning at the top (De Tienne et al., 2004). Davenport et al. (1998) and Storey and Barnett (2000) had concluded that support of the upper level management should be ongoing and delivered in a practical manner.

*Technology* is an essential mediating factor in effective implementation of KM process and practices in an organization. The intervention of information technology (IT) is inevitably important as a tool for successful KM implementation (Bhatt, 2001; Kim, Suh and Hwang, 2003). The role of ICT in knowledge sharing is fully understood only if it is related to motivation for knowledge sharing (Hendricks, 1999). Brazelton and Gorry (2003) had inferred that technology alone may not effectively encourage knowledge sharing activities. Kim and Javenpaa (2008) concluded that the existing relationship between communicating parties play a vital role in shaping technology-enabled-knowledge-activities.

Most of the activities are individualistic and limited to internal peer group, if shared; Interactions with external experts are limited to personal acquaintance (Basu and Sengupta, 2007). Wah, Menkhoff, Loh and Evers, (2007) conducted a study in the tertiary education institution in Singapore to reveal that *rewards and incentives*, open-mindedness of the knowledge sharer, and cost-benefit concerns of knowledge hoarding are the strongest predictors of knowledge sharing in comparison to pro-social motives or organizational care. Abdullah, et al. (2008) studied seven major public universities in Malaysia to infer that appropriate incentives and rewards should be awarded for sharing, searching and the usage of KM Systems as a mode of motivation. Cheng et al.

(2009) has emphasized the importance of providing the right incentive system and understanding the individual's expectation towards knowledge sharing in order to facilitate knowledge sharing behavior.

**Objective and Methodology of the Study:** The objective of the study is to empirically examine the KM Orientation of the mid-tier private management institutes affiliated to the state technical university in West Bengal in lieu of the Key Strategic and Individual-level Enablers. It explores the awareness about Knowledge Management Process, relevant Practices and their Key Enablers in academics at individual-level and organizational-level. Also, through thematic content analysis, the study seeks to establish that the favorableness of certain strategic-level and personal-level enabling factors may encourage the KM process based implementations in management academics.

#### **Methodology of the Study:**

This study is a thematic case research with holistic as well as embedded units' analyses. It has investigated the knowledge orientation in the mid-tier, privately administered B-Schools, MBA Institutes and Departments with courses affiliated to MAKAUT – Maulana Abul Kalam Azad University of Technology, West Bengal. There are approximately 40 such institutes. The embedded units of analysis are 30 senior academicians with at least 10 years of experience in management education in such institutes.

The theoretical construct for the study has been decided through analysis of the certain public reports related to the problem like CRISIL review, etc. and review of extant literature. The construct considers:

- Effective implementation of the KM Process & Practices (KMPP)
- Key Strategic Enablers (KSE) at Organization-Level i.e. Supportive Leadership & Governance, Conducive Work Culture, IT Infrastructure & System and Integrated Performance Evaluation
- Individual-Level Enablers i.e. faculty members' Attitude and Perception
- Context - B-Schools and MBA departments affiliated to the MAKAUT

The two rival theories that are being advocated are:

- (i) Organizational/Institutional enablers when favorable encourage participation and involvement at individual-level by inducing positivity in their Attitude and Perception and thereby facilitate the effective implementation of KM initiatives/ KMPP.
- (ii) Lack of autonomy in institutional operations and administration impedes the favorableness of the KSE and in due course Individual-level enablers for effective implementation of KMPP.

The findings of the study are based on both primary and secondary data that has been gathered from multiple sources of evidence. Primary data has been gathered through in-depth, open-ended but focused interviews, direct observation and participant observation. Secondary data has been gathered from online web portal documents and archives. The data has been corroborated through data triangulation to converge the line of inquiry. 30 senior academicians and some administrative staff and management representatives from the contextual case have been interviewed. The draft summaries have been reviewed by a selected number of senior respondents and then finalized.

The interview transcripts have been analyzed for key phrases and words, categorized into arrays and examined for their frequency. The thematic analysis is guided by the theoretical propositions consisting of two rival theories mentioned above. The technique of explanation building has also been appropriately used.

**The Case Context Profile:** The B-Schools/ Institutes affiliated to MAKAUT exercise little autonomy in running its MBA program. They rigidly follow the prescribed syllabus and curriculum prescribed by the University. In fact, all institutes affiliated to the same state university in a state district follow the same curriculum. Examination and evaluation system is fully coordinated and controlled by the University. They are bound normatively to the bureaucratic

structure prescribed by the affiliating body and blindly follow the schedules set by it.

The University came into operation formally in the year 2001. Almost all the 40 (approx) institutes offering its affiliated MBA degree came into existence after 2001. The privately run self funded programs are also approved by the All India Council for Technical Education (AICTE). The MBA programme is modeled on semester system with specialization in Marketing Management, Financial Management, Human Resource Management and Systems Management and a few others which have not been very popular. The selection of the students for admission into the course is through state-level WBJEMAT (West Bengal Joint Entrance - Management Aptitude Test).

### **Findings & Discussions:**

The data gathered from observations and interviews conducted with senior faculty members and administrative staffs have yielded the following findings, which echo the research findings of Sharimllah Devi et al. (2007) and Chong et al. (2009). MBA institutes affiliated to the state technical university of West Bengal - MAKAUT are nonchalant about the KM initiatives and rather complacent towards benefits of aligning their institutional processes to that of KM process.

- **Knowledge Based Initiatives:** There is tremendous lack of mindset for strategic partnerships and collaborations with the Industry. They do not have any structured policy,

objectives towards national and international strategic partnerships and collaborations (Davenport et al., 1998; Storey and Barnett, 2000). They do not venture beyond routine delivery of the university courses, conducting examinations, admissions and placement. There is no fund flow from the industry or an outlook to even craft such channels. There is little or no concern about the opportunities that lie in institute level and individual level creativity and talent, which may enable future innovations to be taken to the market in collaboration with the industry to deliver long term (5-10 years) benefits to the society.

Senior faculty members are seldom engaged in mapping out the key questions and challenges through brainstorming that have opportunity to add to the knowledge capital/ intellectual property (IP) of the institute. Multidisciplinary approach to research and learning to breakdown the traditional academic silos and drive a new multidisciplinary culture and curricula to attract industry projects is seldom exercised.

- **Leadership & Governance:** The policymakers and governors of the Institute are inefficient and sloppy to ensure a predictable and stable strategic plan to co-op up with the current volatile environment. They fail to realize the priority of Knowledge Management and the criticality of investing in such projects. Such a

policy even if present in a rudimentary and unstructured manner is not communicated through the entire academic community in the institute.

There is a requirement to redefine investment in KM as a source of competence and problem-solving for the society as advocated by De Tienne et al., 2004. Their thought focus must shift from regular *admissions-grooming-placement cycle* to incremental value addition to the continuing batches and to the society through industrious contributions in intellectual capital. Visionary collaborations between industry and universities may accelerate innovation and help to deliver solutions to social challenges. But to harness the tandem, the mission and objectives of the university needs to be redefined in tune with the KM process.

- **Organization Work Culture:** It is found that often the institute's own board and faculty have little freedom to decide and implement on strategic issues. As a result, there is a lack of motive and potential to practice autonomy in actual sense to improve efficiency and effectiveness of the academic processes and outcomes. The faculty and knowledge resource persons mostly have a tendency to resist any innovative initiative as these require more involvement but not incentivized.

Too much emphasis on routine responsibilities leaves the faculty drained out of time. The lecture hours range from 12-20 hours in a week. The faculty dedicates most of preparation time in updating and customizing his study material and handouts so as to make it readily accepted to the students. Faculty assessment focuses mainly on his regular course coverage and student assistance. Little credence is given to contributions in other parameters like R&D and consultancy projects. Therefore, academics is driven more by drawing of a stable monthly salary through routine tasks rather than contributory incentives.

A few accomplished senior professors, who have joined post-retirement on ad hoc but high pay structure supplement the marketability and brand image of the institute to boost admissions. The institute lacks the intention to tap such resources to actually contribute to institute's intellectual goals and achievements. A much larger number of the faculty members are young and bear the regular course coverage load. Besides, there are a large number of visiting/guest faculty from both industry and academia, who commit to the institute only for the allotted time slot. The manpower is also deficient in positive cross-cultural understanding as the B-Schools/ management institutes employ local residents of the respective states mostly.

There is no directive to develop opportunities for academic and industry researchers to dialogue on a knowledge sharing platform. An informal exchange through lectures and seminars that may spark conversations leading to new relationships is very limited.

- **IT Infrastructure & System:** The institutes are usually found to have a sound infrastructure to administer the routine activity schedules. But the concept of Institutional KM and Memory is to be instilled yet. This would require faculty to engage and contribute as subject matter experts (SMEs) with the assistance of the knowledge engineers and skilled technicians. Scheduled training for all the human resource on the KMS is required. Top Management is not aware or not convinced about the returns from such investment in KM System Infrastructure and is therefore reluctant.

Strong two-way communication between B-School administrators, academics and senior corporate officers; regular follow up to keep the dialogue flowing; and impromptu feedback from either side may help to develop a substrate of academics who understand the benefits of KMS. Information system is integrated effectively to implement the routine day-to-day operations but its effective and efficient implementation fails due

to lack of skilled in-house technical staff (Kim and Javenpaa, 2008).

Organization Knowledge must be organized into three specialized categories (Knowledge Marts), namely - *Strategic Knowledge* to set the path and direction to accelerate the organizations' future research, developmental and intellectual contributions; *Operational Knowledge*- to scale up the quality of the pedagogical procedures and protocol for current operations; and *Domain Knowledge* in the various core and special fields of management.

- **Integrated Performance Evaluation and Reward System:** A well-structured incentive/reward system for research/developmental outcomes and contributions is absent. Industry Institute Cell tackles only the student placement related issues. There is no effort to club the basic and applied research with industry for mutual benefit of the institute and the society. Ample funding may be tapped from the Industry through such collaborations to meet the industry gap/ requirement with academic assistance. Leading position must be given to those who bring in more than their academic and research pedigree. Multidisciplinary individuals who may mentor in bridging the knowledge gap i.e. what we have and what is required must be encouraged in creative endeavours.

The Institute should not hang up on counting chickens before they hatch i.e. measuring the results of a strategic alliance in the short run. Most fruitful projects take time to fruit (Szulanski, 1996). Setting artificial metrics to measure them can often undercut the alliance and fail to capture the unanticipated benefits that accrue when a well-structured strategic relationship is built on trust and is managed by people who understand both worlds. Focus should be on quality instead of quantity. Selective projects with focus on excellent strategic benefits through peer review shall attract industry investment and ensure better results.

- **Individual Perception and Attitude:** The faculties as resource persons are found to be quite reluctant to discuss and share their research ideas in intra-organizational forums or engage in intrapreneurial initiatives beyond routine responsibilities (Wind and Main, 1999). This is because there is no regular incentive system to acknowledge and reward such contributions. Besides, some are quite complacent in their attitude and do not venture to any further to routine work.

There is a tremendous lack of 'Learning by Doing' attitude in the academicians as very few are with an experience in industry or the proclivity to network outside their area of expertise. A subtle insinuation of job insecurity adversely affects cultivation of personal

ties that can lead to most creative and promising KM collaborations. Most faculty members consider knowledge as proprietary which should be protected. As a result, the personal knowledge and intellectual capital remains isolated in silos instead of getting integrated with the Institutional knowledge.

The individual-level attitude towards their job and career is to keep things easy-going and comfortable. They are reluctant to take challenges to chase their individual goals based on career planning, and restrict their mobility. They are family oriented and therefore prefer job security to growth and dynamism.

Autonomy may allow the institute to develop structured policy for knowledge based initiatives which may encourage a positive attitude and perception among their employees. The academics focus their efforts towards personalized goals and rarely engage in institutional gains beyond routine (Basu and Sengupta, 2007). There is tremendous lack of organizational belongingness and team spirit among the academics in the context of innovative undertakings.

## Conclusions

Following are the suggestions for effective orientation of the management institutes/ B-Schools to Knowledge Management and the successful implementation of the KMPP in its operations.

1. *Implementation of the KM based Initiatives or knowledge orientation*

to support organizational learning and innovatively contribute to the society must address the concern of multiple stakeholders at the institution's strategic level as well as operational level. KM based institutional processes must support a broad user base and incorporate a cost effective approach to knowledge validation. Such initiatives must meet the two basic objectives: (1) Integration of the KM initiatives with the key processes of the organization (2) KM must enable sharing of the valuable knowledge gained from the previous knowledge capture task. The combination of the two objectives may help to improve the connection of the KM process to the entire academic and administration process in the institute, including the concern of all the stakeholders.

2. *New knowledge generated through integration of the multidisciplinary knowledge* (Bush, 2008; Oplatka, 2010a; Ribbins, 2006) *may be relevant to meet the industrial requirement* and therefore channel in funds from the corporate projects. *Collaborations with the Industry* on one hand may enable employment of the newly created knowledge in solving the real-world problems and on the other hand allow inclusions of the latest happenings in the classroom deliberations (Gunter, 2012).
3. Barriers due to Institutional *bureaucratic mindsets between*

*those tasked with operating the bureaucracy and those who are working within it, i.e. two different thought worlds, must be mitigated to maximize participation* and get the best results from such KM initiatives. While the bureaucratic administration is more focused on the quality of admissions, placement etc., ample focus must be given to collaborations with the industry. The KM initiative can benefit only through involvement, commitment and transparency of the senior administrators and their endorsement to the KM strategies (Useemmay, 2014).

4. *Autonomy at both strategic and operations level is a key requirement for effective KM in the management Institutes.*
5. Organization may begin with implementation of one program and gradually in encroach into other tools and processes. KM implementation consisting of scheduled initiatives and programs must be based on a realistic plan and expectations. Firstly, *the organizations vision, mission, objectives and its behavioural intentions must be aligned with that of the KM processes.* Top management must be counseled and convinced regarding the impact of KM outcome on the institutional effectiveness. It must reasonably set the goals, perceptions and beliefs.

6. *Institutions' vision, mission and objectives must be corroborated to that of the individual employees* to continuously motivate them to commit towards knowledge-centric behavior for long-term competitiveness. Strong and consistent power and at times coercive power requires to be exercised to promote KM. *Visionary leadership* must be cultivated with investment of money, time and resources. Persistent idea generation and knowledge creation from all levels of staff comes through receptive perception and attitude.
7. *Feasibility assessment of the organizational infrastructure* (i.e. physical, technological and financial), *the organizational work culture, performance evaluation system, employees' attitude and perception towards KM must be conducted to set the KM goals*. Reasonably feasible goals may inspire the employees to assess their personal knowledge and enhance through knowledge transfer to meet new challenges.
8. *Cultivate and nurture a conducive work culture* in contrary to a push/coercive strategy. KM initiative requires a collective and coercive effort to use all the available resources into effective utilization.
9. *Stories from the colleagues, peers and senior leaders are rich, credible and effective tools in transferring and sustaining learning* both for the storyteller and for the listener. Any KM intervention should be less than an hour for reasons: the delegates are more likely to clear time to attend; the facilitator is more likely to retain the attention span of all the attendees. *External delivery partners* (Federman, 2014), their styles, method of delivery, connection with the delegates, conference calls after the programme, even humor and personal teaching stories of the facilitators can affect the effectiveness of the KM interventions.
10. *KM oriented behavior can be encouraged through integration of monetary and non-monetary benefits/ incentives to such contributions*. KM Process phases like knowledge sharing, creation/capture, transfer, dissemination/use must be complemented with balanced performance evaluation/rewarding system. In the beginning, employees should be encouraged through personal benefits in the form of direct, monetary, explicit returns with improvement in the course content, innovative teaching pedagogy, publications – both research articles and reference books etc. Also additional increments in the salary and promotions may be awarded. Over time rewards may be made implicit like publicizing the names of the employees along with their ideas/ contributions made to the institute, its processes or provide skill enhancement programs,

extended job-scope. Gradually, the reward system may be geared towards team achievement to encourage creativity, team-work and harmony among the people.

11. *Operational staff greatly affects the successful implementation of the KM programs with their attitude, behavior and participation.* Any kind of negative perception or negative attitude at individual level must be alleviated. Also, fears and misconceptions about KM as that it may lead to downsize organizations or lead to heavy workload or may require too rigid IT expertise.

The study reiterates the impact of enabling factors like organizational work culture as stressed by Tippins (2003) and individual perception and attitude. It also establishes the criticality of Supportive Leadership & Governance, favourable Work Culture, Integrated Performance Evaluation & Incentive System and well-integrated IT infrastructure in creating a learning environment in the education sector.

The findings strongly support both the theoretical propositions. Further, the theories are mutually complementary and not contradictory.

(I) Organizational/Institutional enablers when favorable encourage participation and involvement at individual-level by inducing positivity in their Attitude and Perception and thereby facilitate the effective

implementation of KM initiatives/ KMPP.

(II) Lack of autonomy in institutional operations and administration impedes the favorableness of the KSE and in due course Individual-level enablers for effective implementation of KMPP.

Affiliation to the State University binds the Institute to operate within the mandate set by the university and impart the syllabi 'as is' to the students. Internalization of the KMPP at all the levels of operations, implementation of fully integrated IT and KM System, regularized policy for rewarding/ incentivizing KM/IC contributions, clear perception and positive attitude at individual level through engagement and acknowledgement are drivers of the KM implementation.

An improved management of Knowledge and Intellectual Capital shall unfailingly add rigour to the B-Schools/ management institutes. This shall help the management academics in the mid-tier in particular, to recover from the lull.

Future research in the context may be extended with quantitative techniques and tools. The construct may be researched in other geographical territories and zones to strengthen the arguments presented in the paper. Quantitative research with the construct may consider more enabling factors like training, empowerment, benchmarking, organization structure etc. A longitudinal study may serve to reinforce the suggestions of the study.

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# Business Intelligence Systems: A Necessity for Agile Supply Chains

Subrat Sarangi

School of Management, KIIT University,  
Bhubaneswar- 751024, India, subrat@ksom.ac.in

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## ABSTRACT

*Enterprises today have to be more responsive and agile to customer needs. In addition to being able to deliver in shorter lead times, they also need to manage much wider assortment of products. Thus the challenge for the enterprise is threefold – increased number of SKU's (Stock Keeping Units); reduced lead times and flexibility to accommodate last minute order amendments. In such a scenario, the entire value system has to be seamlessly integrated with every upstream and downstream channel partner sharing business intelligence for an integrated decision making process, thereby establishing a globally optimized system. Business intelligence (BI) overarches the decision support systems and processes for effective decision making while building agile supply chains. This paper bridges the gap in extant literature on the importance of BI in building agile and responsive supply chains through best practices and case examples of global and Indian firms. The paper enumerates the guiding principles of an agile supply chain and the critical success factors to establish such a system. The paper also analyzes the factors that are essential for firms to adopt technology which is a key enabler in the entire process.*

**Keywords :** *Agile supply chain, business intelligence system, data mining, data warehousing, decision analytics, real time information, technology adoption, decision support system.*

## Introduction

Lack of patience, restlessness, value price offerings and extended customer service facility are some of the attributes which characterise a typical customer today. The need of the hour is to make goods and services available, acceptable and affordable to the customer. The “Three A’s” take a heavy toll on the manufacturer, distributor and the retailer

as they look to establishing an efficient and agile supply chain. From the neighbouring “Kirana Store” in the locality to the supermarkets<sup>1</sup> and hyper markets<sup>2</sup> (e.g. Big Bazaar, Hyper City Mall, and Star Bazaar) at the town centre, every retail store has to face this challenge to retain its customer base first and work on increasing market share. Catering to the needs of the

customers with varying demographic and socio economic backgrounds in a diverse country like India becomes all the more challenging. Understanding buying behaviour in terms of wallet share by category and SKU, time of purchase during the day, spend per visit, brand preferences by category, to name a few becomes critical in order to avoid loss of sales, enhancing customer lifetime value and focusing on high margin items. These decision analytics can be made available to the retailer and the upstream channel members only if there is a robust technology layer which collects, analyzes and provides the necessary dashboards at the right time intervals. All these lead to building an agile supply chain connecting the supplier's supplier and customer's customer. Modern day enterprises take help of robust BI systems (BIS) to take informed and globally optimized decisions that help firms not only to increase revenue, but also at the same time control costs and overheads. This paper studies the role and importance of BIS in establishing a responsive and agile supply chain through best practices of leading firms across the globe and India spreading various industry domains.

The paper is divided into eight sections starting with the introduction and followed by the review of literature. Subsequent sections define the features of

an agile supply chain, criticality of technology adoption and role of BI in building agile supply chains. The concluding sections of the paper deal with challenges and impediments in building an integrated BI, conclusions and references.

## **Literature Review**

Business Intelligence (BI) as a term was first used by Gartner Group in 1989. Extant literature defines BI as a combination of concepts, methods and processes to improve business decision making (Muller et al., 2010). Cabral et al., (2012) specifically discuss the role of BIS in enhancing overall supply chain performance in terms of selection of key performance indicators by applying analytic network process (ANP) in an auto maker's supply chain. While it can be observed in extant literature that BI has been studied considerably in general, specific research pertaining to supply chain performance has been scant. One of the latest works on this theme (Sangari & Razmi, 2015) discusses the relationship between agility in supply chain and BIS, measured by agile capabilities and agile performance. Sangari, Razmi, & Zolfaghari, (2015) have proposed a reference framework for measuring supply chain agility using grounded theory. A dip stick view of extant literature throws light on several research papers that approach the correlation between BI and supply

<sup>1</sup> Supermarket is a self-service store offering a wide variety of food and household merchandise, organized into departments.

<sup>2</sup> Hypermarket is a superstore combining a supermarket and a department store carrying a wide range of products under one roof, including full groceries lines and general merchandise

chain performance in a more generic way. Sahay & Ranjan, (2008) study the role of real time BI in ensuring customer loyalty in service oriented firms. The importance for integration of the value chain partners to have a single holistic view of the system as a whole has been brought about by Power (2005). Similarly the importance of BI in demand forecasting has been highlighted by Krupnik (2013). In a comprehensive review of literature on BI and its application between the period 1997 and 2006 covering 167 articles, it was observed that about 94 articles pertained to implementation of BI (e.g. CRM, ERP, SCM) and aspects of collaboration, integration, customization etc, (Jourdan, Kelly Rainer, & Marshall, 2008), thus indicating the importance of the topic.

An analysis of the importance of BI was studied in detail in extant literature tracking various reports from technology analyst firms. It may be deduced that increasingly firms have started implementing state of the art BIS to not only get a handle of the historical and current performance trends, but to predict the future performance using predictive analytics of BIS. The adoption of technology is fast and growing, more so in the developed world. Gartner Inc. has forecasted a 5.2% increase in BI spend globally year on year, with the figure estimated to touch 16.9 billion USD in 2016<sup>4</sup>. Further, it is predicted by a leading

analyst firm, Research and Markets that BI spend would grow at a compounded annual growth rate (CAGR) of 8.25% over the five year period 2014-19 and reach about 27 billion USD in 2019. Thus it can be concluded that role of BI in establishing and nurturing agile supply chains is one of the most relevant research areas the field of technology and operations management.

This paper bridges the gap in extant literature on the need for BI systems to develop an integrated, collaborative and agile supply chain. The paper is conceptual and is based on best practices and success stories of firms both in the developed and the emerging world. The author also shares his consulting experience in development and implementation of BI systems to build agile supply chains.

### **Agile Supply Chain - Features**

The characteristics of an agile supply chain are its ability to be responsive to changes in demand patterns much faster. They are nimble and based on a pull system rather than push. Best in class supply chains make use of predictive analytics and predict demand real time for raw material, components and end products or services based on past and ongoing trends. The philosophy that drives the design of such supply chains is goods made to order or configure to order or assemble to order based on the trends. Fig. 1.0 represents the guiding principles of an agile supply chain adopted from the

<sup>4</sup> <http://www.yellowfinbi.com/YFCCommunityNews-Business-Intelligence-software-spend-to-boom-in-new-era-of-accountability-216786>

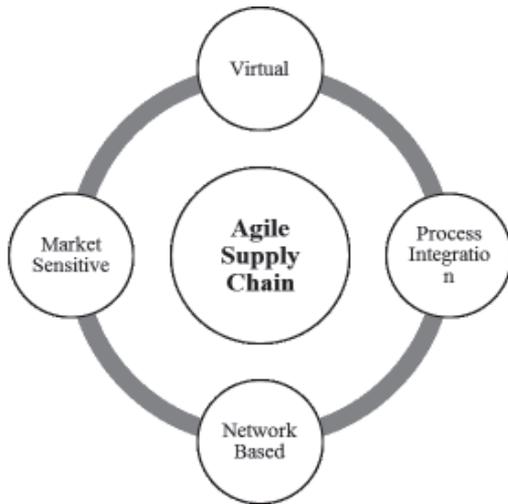


Fig.1 Agile Supply Chain Guiding Principles<sup>5</sup>

A detailed analysis of the guiding principles indicate that to establish an agile supply chain there are certain enablers and attributes which every member in the supply chain needs to adhere to. They are:

*1. Establishing a Virtual System:*

Every entity in the value system i.e. both upstream and downstream needs to be integrated with seamless exchange of information. Real time access to information pertaining to inventory i.e. finished and work in progress (WIP), production schedules and job schedules, tracking logistics carriers, etc is critical. The view of the overall supply chain real time enables informed decision making which is much faster and reduces time to serve. Transparency in the chain reduces bull-whip effect and overall inventory in the chain, thus reducing the cost of goods sold.

This is possible with technology layer integrating the various entities. We discuss in the subsequent sections the varying degrees of maturity of virtualization and networking within supply chains and its effects.

*2. Trust:* As agile supply chains need to be transparent and operate on global objectives rather than operating in silos, there needs to be a great level of trust between different entities. Manufacturer's suppliers need to reveal all information vital for the manufacturer to know i.e. identity of supplier's supplier, delivery schedules, delays or postponements if any, quality issues and its impact on delivery schedules etc. In turn the manufacturer also needs to be transparent in sharing the order volumes and pipeline across different order buckets, order amendment status, production schedules etc. This is possible when all the entities in the supply chain are willing to collaborate and share information which may be viewed as confidential to their business. Thus trust between the partners enables free flow of information and data which helps informed decision making.

*3. Investment in Supply Chain:*

Supply chains have limitations unless there is certain degree of automation at every entity level. Building a resilient and agile supply chain demands technology enablement of the various entities. Whether disparate enterprise applications or similar,

<sup>5</sup> Source: Martin Christopher, Cranfield School of Management, [http://www.sclgme.org/shopcart/Documents/creating\\_the\\_agile\\_supply\\_chain.pdf](http://www.sclgme.org/shopcart/Documents/creating_the_agile_supply_chain.pdf)

an integration of the platforms for real time exchange of data, transactions and analytics is key. This is possible only when firms are willing to invest in technology to realize the long term benefits. Building an agile supply chain is a strategic decision and hence to have a sustainable business ecosystem, firms need to commit themselves for a long term period.

Though agility and responsiveness is key to reducing supply chain risk, there are impediments which need to be overcome. One of the critical success factors in setting up an agile supply chain lies in adoption of technology and transitioning from age old manual systems to an integrated technology platform. Hence firm preparedness and willingness to adopt state of the art technology is essential for building an agile supply chain. Based on the author's personal experience, it can be stated that maturity of supply chains is a function of the industry in which the firm operates, age and maturity of the enterprise, scale of business and the vision of the firm. Adoption of technology by a firm is impacted by all these factors. In the following section we analyse the criticality of technology adoption across a few industry sectors.

### **Criticality of Technology Adoption**

There is a linkage between technology adoption and supply chain performance. The paper attempts to bring out this aspect

across a spectrum of scenarios and the impact it has on overall firm performance.

#### *1. Shorter Product Lifecycles:*

Firms offering products and services which have a very short product life cycle i.e. music, books, garments and accessories, mobile phones, laptops and computers have a greater dependency on a pull based supply chain. The sales of the products peak within three to four months of launch and start declining by the fourth quarter. Thus production and sales planning with historical data becomes irrelevant. It is important to have a better assessment of point of sales (POS) data including "early sales data"<sup>6</sup>.

Researches have indicated significant improvement in forecast accuracy based on early sales data. A case example of an apparel firm dealing with fashion garments, indicates an improvement of forecast accuracy to 92% based on first two weeks of sales data vis-a-vis 45% in a gut feel based forecast (Fisher et al., 2000). In such a scenario, it is essential to have access to POS data on early sales, patterns of sales by competing brands, past sales performance by demographics (e.g. age, gender, income group) of similar products, sales performance by region and store format (e.g. specialized vs. Convenience vs. Supermarkets). The data is then run through various cycles of analysis to provide the key metrics and patterns on

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<sup>6</sup> Sales patterns in the initial one or two weeks of launch of the product across different retail formats

demand by SKU, margins, revenue, store format etc which then goes into the planning cycle. For example, data analytics enables a fashion garment manufacturer to order a specific number of a particular colour, size and design of T-Shirt from its contract manufacturer based in Pakistan or India for sales in a Target store in outskirts of Baltimore, USA. The same example may be extended to the mobile phone display manufacturer in Taiwan for a particular model which has been just launched along with few more for sales in London. Hence nature of the industry for the firm has a strong influence on propensity for technology adoption.

*2. Maturity of Firm:* Technology adoption by a firm is also a function of numbers of years in business, especially for categories in the maturity stage of product lifecycle. These would be product categories i.e. cement, hot rolled coil steel, television sets, and refrigerators, to name a few. However, exceptions do exist and there are innumerable examples of firms that are technology savvy and within the first 2-3 years of inception, invest on automation and are early adopters of technology. This has got to do more with the nature of leadership. But the generally acceptable norm while setting up enterprises is to first stabilize the operations, build a customer base and ecosystem and then venture out to other areas which need funds. In a conservative set up like this, adoption of technology is slow. Hence it becomes a bottleneck to build agile supply chains around such firms.

For example, steel firms globally and especially in India have been very slow in adopting enterprise applications though they have a multi tier supplier and customer base with huge complexity in production and inventory management. Even post adoption, managing change and acceptance of technology by workforce is another daunting task. But once the successful integration happens, the firm is able to plan inventory across the supply chain, including the steel service centres which are closer to the customer and supply cut to length sizes to the automotive, consumer durable, infrastructure and engineering customers. For the steel mill, the historical demand data by customer across various specifications in different quarters provides a sound database for statistical analysis to ascertain demand pattern. Mining of historical data, assessing seasonality in demand, identifying low volume and high margin variants are some of the analysis done by the marketing and planning departments. For example, considering the surge in demand for white goods during festival times i.e. Diwali, Dussehra or Christmas, steel firms plan the production schedule in such a way that specific grades of colour coated steel required by white good manufacturers are produced in those periods and the steel service centres also stock the desired length and sizes of blanks to be supplied to the end customer.

*3. Impact of Business Environment:* The influence of competitors, channel partners, customers

and the quality of technology solutions available for the industry in general and firm in particular makes a huge impact on speed of technology adoption. In an industry where there are a plethora of software solutions, the rate of adoption is higher. Similarly, when the adoption is high in the ecosystem i.e. most suppliers (tier 1, tier 2) are automated and there are EDI (Electronic Data Interchange) systems in place, there is peer pressure for the incumbent to bring in automation.

Thus, adoption of technology and embracing change from a manual process to a transparent and real time integrated technology platform is a huge transformation for a firm. This is a greater challenge in emerging economies like India, China, Brazil, Vietnam, Indonesia, Malaysia and Russia that have experienced a dramatic growth phase over the past one and a half decades. While the firms have grown significantly, the talent pool is yet to catch up with the desired skill set to match the growth, and therefore it becomes a case of complex transformation. This challenge is to stay for the next few years at least, as these economies battle the economic crisis and the human change related issues acting as impediments to technology adoption.

After having discussed and analyzed the features of an agile supply chain and the influencers of technology adoption, the paper explores in greater detail in the next section the role of BI in transforming firms and making them more customers focused,

agile and responsive to market dynamics. Further, the paper goes on to bring out the latest trends and what have been some of the challenges which firms are going to face in the times to come, with the proposed counter measures.

### **Role of BI in Building Agile Supply Chains**

Before a detailed analysis of the benefits and implications of BI in building agile supply chains is discussed, it is imperative to map the progress of this field of study i.e. Decision Support Sciences (DSS) as has been termed over the last 5 – 6 decades. Analytics in its first avatar appeared in the late 1960's and early 1970's as Decision Support Systems (DSS). Terms like Data Warehousing (DW) and BI started to be used by both industry and academia in late 1980's and early 1990's. Today BI is used as an umbrella term covering different aspects, namely, technologies (e.g. data cleansing tools), processes and applications (e.g. Online Application Processing). An architectural schema of BI system is given in Fig.2. It represents the various data sources from various technology platforms leading to a data warehousing system and subsequently to generation of reports for effective decision making. Analytics is also being used interchangeably for BI, predominantly from a commercial engagement stand point wherein firms are outsourcing the function to specialized service providers e.g. Infosys, Wipro, TCS, Genpact, to name a few.

At different points in time researchers have defined BI in their own way. Adelman et al. (2002) describe BI as a term that encompasses a broad range of analytical software and solutions for gathering, consolidating, analyzing and providing access to information in a way that helps enterprise's users make better business decisions. Malhotra (2000) defines BI as the platform which facilitates networking and bringing real-time information to centralized repositories and support analytics that can be exploited at every horizontal and vertical level within and outside the firm. There are many similar explanations on BI in extant literature. However, a comparison of the definitions reflect that the main objective for enterprises to invest on BI applications has been to derive meaningful inferences from huge data repositories generated from various business transactions, which in turn assist in better decision making, maximizing customer and firm performance.

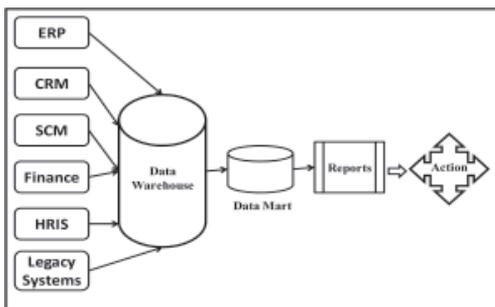


Fig.2 Architectural Schema of a BI System<sup>7</sup>

Supply chains can be designed to be agile on robust BIS within the value system of the enterprise. Though firms have been operating with very basic data mining and

intelligence systems, they are significantly constrained in building a world class supply chain. Success stories of some successful enterprises and how they have approached in designing their supply chains is explained below.

## Case Examples in Western Countries

*1. Caesars Entertainment Corporation:* An American public gaming firm with interests in casinos, hotels, golf courses and resorts became a market leader by devising its growth strategy using BI to understand customer profitability, lifetime value of loyal customer base, target segments and need gaps. The firm realized that to create sustainable competitive advantage, it had to develop a DSS based on robust a BIS especially in a high growth industry like entertainment.

*2. World Group:* Japan based World Group, a leading fashion garment player is able to manage the entire cycle from new product design to delivery at the store within three weeks and a cycle time of just two weeks from order to delivery at the store. This has been possible with adoption of robust sales forecasting practices of early sales trends, seasonality and integrating production, design and distribution centres with real time information exchange. World Group with its various group companies have integrated on a single technology platform with real time information exchange, leading to setting up a responsive firm to changing fashion trends and patterns.

<sup>7</sup>Adapted from Solutions, L. (2016). Business Intelligence, (February). Downloaded on 1<sup>st</sup> July, 2016

3. *Proctor & Gamble (P&G)*: P&G is arguable the leader as far as adoption of technology and BI is concerned among consumer product group (CPG) firms globally. BI is claimed to be one of the four pillars in their digital strategy and the firm proudly claims to have competitive advantage in the field. The BI program at P&G centres around the fifty plus “Business Spheres”<sup>8</sup> where each Business Sphere provides executives access to 500 million data points each month ranging from POS data from retailers, syndicated market reports, internal ERP, inventory and shipment data. In addition to the systems generated data, information collected from letters, emails, phone calls and blogs also reside in system providing insights, drill downs, charts and on the fly analysis (termed as Decision Cockpits) for better decision making. The BI tool has also helped P&G significantly in their innovation drive, in identifying new opportunities and breakthrough product or service ideas. On the whole, P&G has been able to build a responsive and agile supply chain integrating all its value chain partners with the help of the state of the art BI tool.

4. *Wal-Mart, TESCO, Target & Other Retailers*: Retail industry along with few others have derived maximum benefit from BIS in not only managing CRM led decisions, but also enhancing efficiency and effectiveness of suppliers, warehouses and

logistics service providers. TESCO, Wal-Mart, CostCo, Amazon, Kroger and Carrefour have been the pioneers as far as leveraging technology in building DSS is concerned<sup>9</sup>. With a modest beginning of identifying sales patterns by SKU at a store level, today there is real time linkage between the retail outlets with the DC (Distribution Centre), TPL (Third Party Logistics Carrier), corporate data centre and the gamut of suppliers. BI in retail sphere has been at the most advanced level with assistance in decision making in terms of shelf arrangement, stocking in shelves, stocking near billing counters, type of store lighting by category of stocking, to name a few. All these analysis are being done at a SKU level so that right items are stocked at the right places in the right quantities. Retailers through loyalty cards are also tracking customer specific buying behaviour, spend by category, and spend by season / month / days and time of days.

With emergence of one market - the global market, enterprises have realized the need to serve customers faster in terms of “what they want”, “where they want”, at the “right time” in “right quantity”, “right quality” and at an “affordable price”. This has been a benchmark for firms desiring to build a responsive supply chain with minimum disruptions. The above examples of the developed world demonstrate the role played by BI in enabling this transformation.

<sup>8</sup> In-house BI tool at P&G

<sup>9</sup> <http://www.investopedia.com/articles/markets/122415/worlds-top-10-retailers-wmt-cost.asp>

While adoption of BI as a business enabler has been more prevalent in the western markets, of late emerging countries like India, Brazil, China, South Africa, and Malaysia have shown a drastic improvement in implementing BI applications and solutions. Some of the Indian firms that have implemented best in class BI DSS have been explained below.

### *Case Examples in India*

*1. Tata Steel:* Tata Steel is one of the early adopters of predictive and prescriptive decision analytics, especially for the outbound supply chain. The firm has well established marketing and planning departments who have the responsibility to determine the sales plan and the production plan based on historical trends and future demand projections by customers. Robust statistical analysis is done on historical data by customer and by time period analyzing the spikes. Market intelligence on competitors, both in India and globally is also integrated with the forecasts collected by field sales force from the customer pool to arrive at the demand plan and the production plan. The technology platform integrates the production centers, yard, sales force and the leading channel partners sharing real time data on orders, stock positions, production runs etc to make informed decisions.

*2. Toyota Kirloskar Motors Ltd (TKML):* TKML has been one of the first firms to have an integrated dealer

management system (DMS) connecting the firm's dealers across India. The core of the DMS is the Warranty Management System which provides vital decision analytics on frequency of failures by component and vehicle type that is used as an input in vendor rating and evaluation. This particular aspect of evaluating and rating vendors is being used today by most of the leading automotive OEM's (Original Equipment Manufacturers).

In addition to the above two specific examples, there are innumerable applications in banks, insurance, retail and telecommunication industry. The case of Bharti<sup>10</sup> is very well documented in public domain as how they have gone about with the on demand business solution offered by IBM India encompassing CRM, data warehousing, billing and other online collaborations. This has helped Bharti in understanding the diverse customer base better and design specific services depending on the target segments to maximize lifetime customer value.

The above success stories of firms that have understood their customers and serve them better, have in place a robust BI solution. These firms have used it as a source of competitive advantage. It is an integral part of their value system that integrates the supply chains of suppliers and customers. This has been possible by practising certain processes and norms of governance over a period of time. Agile supply chains are built over years of trust

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<sup>10</sup> <https://www-03.ibm.com/press/us/en/pressrelease/6910.wss>

and process driven behaviour by partners and the following section reflects some of the impediments and challenges in building an integral BI system.

### 1. Challenges & Impediments in Building an Integral BI System

Organizations face various challenges while implementing a BI system. The source is manifold – technology, people, processes and governance, to name a few. The impact is far reaching as it could very well make the entire system redundant and dis-functional. Based on prior experience and published research some of these impediments are highlighted below.

*1. Discipline in entering data at POS, Warehouse, DC:* Many retailers, especially in emerging economies are sceptical about the quality of data that they possess and hence are unsure of taking decisions based on system reports. This mainly happens due to lack of discipline in process adherence by personnel manning the billing counters and goods return counters. Some glaring practices are those of using price look up function and matching product by price rather than product code and thus resulting in mismatch in actual store stock vis-a-vis system reporting stock. For example, a billing counter clerk in a hurry could enter two items for Coke 1 Litre bottle which is priced at INR 50/- as against 1 item of 1 Litre. Coke bottle (priced at INR 50/-) and 500 gm of Tide Detergent (priced at INR 50/-), which is the actual transaction. As a result the in-store inventory for Coke

1 Litre is erroneous by +1, while Tide 500 gm by -1 as against the system. Similar errors also crop up when data entry is not proper for product exchanges and returns or even maintaining inventory records at warehouses and distribution centres. The best practices to address such concerns and improve data quality are:

- a. Physical matching of stock with system data: Matching in store physical stock with system data and amending errors on a periodic basis
- b. Training: Periodic training of store staff at billing counters, returns desk, back room inventory from time to time and explaining the importance of data quality and its impact on sales. The same may be experienced at the warehouses as well.
- c. Skill levels: One of the key success factors in any technology intervention in business processes is the skill levels of people performing the function. Thus, hiring of skilled resources performing the various functions i.e. inventory tracking and record keeping, billing, goods return and warehouse systems provides the necessary edge to firms in implementing technology solutions, be it ERP or a BI platform.

*2. Technology solution and business requirement fitment:* On many occasions availability of the right solution fitting the business need is an impediment. The mismatch in the need versus availability may be due to single or a combination of factors.

- a. Not meeting the business functionality: Non availability of a BI solution which is able to provide the necessary functionality to capture the nuances of the business processes is a challenge. As a result, the extent of customization is huge which impacts the Total Cost of Ownership (TCO) and compromises on some of the in-built features which are not made to use.
- b. Size of business: An assessment of BI space indicates established players which typically cater to large businesses. Though of late SMB segment has been a focus area, it has not been a very attractive segment historically. So there have been gaps in terms of market segments and solutions which hinder adoption of BI. Besides fringe players do not have a very robust offering and their future support is questionable, which makes them vulnerable as a partner of choice.
- c. Implementation and support: This factor is more applicable for start ups and SMB segment firms who do not get the right quality of skills for implementation and support for the budget they could afford. Hence affordability becomes a challenge.

Building a robust BI solution lies partly with the enterprise and to a great extent with the business environment. While firms transform their mindset and move towards building responsive systems, the business environment, namely the IT product and services firms also need

to expand their coverage and offerings for greater penetration and adoption of small and medium sized firms.

### **Conclusion**

Business Intelligence and analytics shall continue to be the drivers of intelligent decision making in the times to come. While Gartner forecasts global BI spend to touch about 17 billion USD by 2016 end, Research and Markets projects the value of BI market at a whopping 27 billion USD by 2019. Though structured data has always played a pivotal role in supply chain analytics, of late unstructured data sources from social and digital media through Facebook, Tweeter, Instagram and Pinterest, to name a few, are having significant influence in determining consumer choices and trends. The influence and impact of social networking sites does not just restrict itself to B2C (business to customer) transactions, but has far reaching influence on B2B (business to business) transactions blurring and transforming supply chain drivers.

Estimates indicate that 30 billion exchanges are shared in Facebook every month and Wal-Mart on an average handles more than 1 million customer transactions every hour, feeding databases at more than 2.5 petabytes. Data measured in terms of volume, velocity and variety has been given supreme status that of a new class of asset like currency or gold by none other than the World Economic Forum<sup>4</sup> 2012 held at Davos, Switzerland. Thus to be competitive in the

future, firms need to acknowledge the reality that data leading to meaningful business decisions shall drive business in the future. Key to building a sustainable business model will lie in having an agile supply chain enabled by a robust BI platform. It also provides a huge scope for researchers to focus on this area considering industry specific nuances covering aspects of people, processes, technology and governance as some of the worthwhile dimensions.

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<sup>11</sup> Big Data Big Opportunity, Financial Executive, July-August' 2012

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# Millennium Development Goals and Post 2015 Framework : An Indian Experience

**Shikta Singh**

School of Management, KIIT University, Bhubaneswar  
shiktasingh@ksom.ac.in

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## ABSTRACT

*It is already clear that progress has been rather mixed. The agenda of the Millennium Development Goals (MDGs) has been cut back to a standard set of statistics, and macroeconomic, sectoral or institutional reforms of a technical nature. Growth has been equated as panacea for all forms of deprivation. However, the MDG agenda failed to bring fundamental transformations in human development and society to make it more inclusive. An objective and impassionate analysis of the past achievement and current trajectories are essential to understand reveal our conceptual, structural and operational deficiencies and the kinds of reorientation needed to ensure that SDGs are much more attainable. Such reorientations would include; prioritizing type of growth, disaggregated regional and local targets rather than global standards, focus on qualitative aspects of human wellbeing over technical 'solutions', and the painstaking work of developing national and sub-national enablement over quick outcome indicators. It further probes into the matter relating to India's recent development experience which shows that achieving the ambitious vision by 2030 will require addressing a wide range of challenges. Agenda of inclusive and holistic growth can accordingly no longer neglect the link between the economic, social and environmental dimensions of development which needs long term integrated policy making. Conceptualizing, planning and implementation beyond 2015 must be made integral, normative part of economic, social and environmental objective of the nation.*

**Keywords:** MDG, SDG, Sustainability, Sectoral, Economic growth

## 1.1 Introduction

The Millennium Development Goals (MDGs), an off shoot of Millennium Declaration agreed by 189 countries in September 2000 marks the beginning of a momentous global effort ushering in new method of worldwide mobilization

towards achieving a set of vital human and developmental objective. They embody widespread public concern about growing poverty, hunger, malnutrition, dreaded diseases, illiteracy, gender disparity, and environmental degradation. These

concerns synthesized into easily explainable set of eight goals, with 21 targets and time lines, the MDGs not only promoted global awareness, but also build public pressure and made accountability of ruling class, improved metrics, social feedback & public pressures.

## **1.2 INDIA's experience with MDGs: A mixed bag of glories & pitfalls**

The MDGs has been an integral part of development agenda for India. According to the UN Report & India Country Report 2015, though India has made remarkable progress in achieving some of indicators of 4the MDGs targets, achievement in some others indicators has missed the target or unlikely to be achieved. With below poverty line (national) reading of 21.9 per cent of the population as per official estimate, poverty reduction by half target is already achieved.

On education indicators, the county is on track to achieve universal primary school enrollment for both boys and girls and according to the report and already abolished gender disparity in primary & secondary and likely to do so in tertiary education by 2015. Goal of reducing hunger by half and maternal mortality by three quarters is likely to be achieved. Trend reversal has been achieved in spread of deadly diseases like HIV/AIDS, malaria and tuberculosis. Increment in forest cover is achieved and more than 50% reduction is achieved in number people who do not have access to safe drinking water. The

achievement in penetration in telephone and internet connection has been spectacular.

However, the country's performance has been far lagging behind on other indicators. On indicators for 1empowering women through wage employment and political participation(Goal 3), reducing infant and child mortality(Goal 4) and improving access to safe drinking water, 1access to adequate sanitation & eliminate open defecation(Goal 7), the progress is far off the track. It is evident that progress and achievement of MDGs across states is uneven irrespective of the state of economic growth.

### **1.2a The Unfulfilled Agenda**

Despite rapid economic growth and positive human development, Indian remains highly segmented and income inequality is widening. Nearly 50% decline in Poverty Gap Ration (PGR) both in rural and urban areas during 2004-05 to 2011-12, is a statistical mirage as share of poorest quintile in national consumption which is an indicator of inequality has declined over the period 7.1 % (urban) & 9.1%(rural) in 2011-12 against corresponding figure of 8%(urban) and 9.6%(rural) in 1993-94. Estimate of national poverty line and differences among states in India itself is matter of much debate and contention. A large number of people whose consumption levels are at the threshold of poverty line remain vulnerable and minor shocks—natural disaster, crop failure, illness,

indebtedness—can easily push them below the poverty line.

Skewed growth pattern and widening inequality have led to concentration of poverty in poorer and less developed states. Poverty incidence in rural area is almost twice that of urban areas, and more severe among marginalized groups.

Large numbers of school going age children are still out of school and drop-out rate is very high at secondary and higher education level. Quality of education as reported by ASER (Annual Survey of Education Report) of PRATHAM and recent UNESCO study is a major cause of worry. Learning in the area of mathematics and reading are very poor as revealed by direct testing of primary school students.

Gender inequality remains high. Literacy rates among women fall behind that of men, thus evidencing women's poorer participation in learning outcomes and opportunities. Empowering women remains a major development challenge. Economic, political and social empowerment still elude them as reflected in low proportion of women working in non-agricultural jobs (19.3% by 2011-12) and will certainly miss the target of 50% by 2015. With declining share of women in rural labour force, they suffer lack of land ownership for those engaged in farming; and women are poorly represented in parliament (only 96, share of 12.2%, out of 784 in national parliament) against target of 50%. This

reflects a picture of bad and ugly with respect to the achievement of MDG indicators.

### **1.3 MDG & GROWTH – The debate goes on**

The linkage between economic growth and achievement of MDG Goals has always been a point of debate. Growth can be termed as pro poor if it leads to measure of poverty to fall. A functional definition of pro-poor growth has been provided by Pasha (2007). For growth to meaningfully contribute in poverty-reduction, it should happen in sectors which provides maximum employment to the poor, like agriculture, construction; in sectors whose outputs constitutes major portion of poor's consumption basket, like food, in areas predominantly inhabited by poor - rural and tribal areas and utilize factors of production which the abundant with poor, e.g unskilled labor. The link between pattern of economic growth & its sectoral composition, employment and poverty reduction and what is needed for development beyond economic growth is discussed below.

#### **• Employment**

Employment is one of the main instrumentality which leads to poverty reduction through growth. Employment being the principal source of income, which in turn is the key measure of poverty, employment generation must be the at the core of poverty reduction agenda, which can be labelled as- 'employment nexus between growth and poverty' and remain

unaddressed. The importance of employment growth in influencing the rate of change in the incidence of poverty, after controlling for the effects of economic growth has been established in studies across south Asia.

Sectoral composition of economic growth, the choice and level of technology and effective functioning of the labor market also influence the rate of growth of employment. In line with the above, labor-intensive sectors like agriculture and construction can be identified as pro-poor sectors. Agricultural and allied activities mostly take place in rural areas which accounts for substantial portion of poor. Hence, structurally, growth to be pro poor, employment intensity sector must lead to expansion in the outputs directly or indirectly induced. The pattern of growth is no less vital than overall growth, for poverty reduction.

### • **Beyond Growth & Poverty Reduction**

Growth is not sine qua non for development. Pro poor economic growth, directly contribute towards the poverty reduction target of Goal 1. However, a reduction in income poverty is, to some extent, tautological (Saikia 2007); a person is not considered as poor when his income crosses the poverty line. However, this is not sufficient for attainment of Goals 2 to 7. Availability and consumption of certain minimum goods and services called "MDG goods & services (Saikia,2007) is essential for achievement of other goals. For example, consumption of minimum

amount of food is required to reduce somebody's hunger and a pregnant woman must be under supervision of qualified medical professional for regular check-up for reduction of maternal mortality rate, and birth must be attended by skilled health personnel i.e. consumption of health services.

Customs, traditions, social norms, lack of awareness are some of the non-income barriers which impediments consumption of "MDG goods and services," (i.e. nutritious food, safe drinking water & sanitation, health services and education leading to learning) in spite of possessing adequate level of income. Very often, severe supply constraints like absence of health clinic / hospitals in neighborhood and cost of transport to nearest health centre increases the cost of health services and impede consumption. Similar linkage hold good for safe drinking water, sanitation, education. Apart from agriculture and construction, certain other key sectors of the economy road, transport, energy, water, health, sanitation and education are of critical importance to achieve the MDGs.

In essence, if economic growth along with contributing to income generation to the poor leads to improvements in both physical and social infrastructure, then MDG goods and services become affordable and available for consumption in adequate quantities to the poor. Then that will facilitate achievement of Goals. On the other hand, an expansion in the MDG goods and services sector can also

act as an engine of growth. <sup>̄</sup>pro-MDG growth into <sup>̄</sup>pro-growth MDGs ( Saikia 2007).

- **Growth needs to be Inclusive**

Though Cross-country studies indicates that, on average, growth and income of poor people are positively correlated (World Bank, 2005), averages, however, conceal how poor people (poorest quintile) benefit from growth in comparison to the whole population. Robust and persistent economic growth in Asia, Africa region, has not been able to achieve employment related MDGs, due to joblessness of growth. The impact of growth on MDG can not only be through individual and household involvement in labour or agricultural sectors. Redistribution and channelization of the benefits of growth, through social protection schemes, entitlement program is also crucial – both to reduce poverty directly and to allow people to benefit in other human development.

### **1.3 MDG to SDG – Leaving No One behind – Road Ahead for India**

The apparent deficiency in MDGs achievement are a pointer to conceptual and operational failures that should be major cause of worry and learning point for all stakeholders, in both north and south. Too many were left behind, Individuals forgotten in the race to improve statistical averages. In its broadest sense, <sup>̄</sup>Leave No One Behind means that all goals, targets and indicators will not be considered met unless they have been met

for every person on the planet. While the world community will take few more years to even achieve the unfulfilled basic goals across continents, concerns about climate, environment and sustainability of the present pattern of growth have forced all stakeholders to set new goals to encompass all above concerns.

#### **1.4a Why & What of SDG?**

The idea of the Sustainable Development Goals(17 nos. 169 targets) based on the Open Working Group (OWG) deliberations which was mandated by the Rio+20 outcome document *The Future We Want*, has become the rallying point for discourse on development and sustainability beyond 2015. Although specific definitions vary, sustainable development encompasses the triple bottom line approach to human wellbeing which are combination of economic development, social inclusion and environmental sustainability (Jeffrey Sach, 2013). While poor were the focus of all MDGs; SDGs are envisaged to go much beyond that, with goals touching upon inequality, quality of governance, urbanization, agriculture, infrastructure, and climate change.

Though the developed countries will not have the least difficulty with few SDGs around ending poverty, hunger, health, education, sanitation, many of these which are unfinished MDGs, are the problems that developing countries, on the other hand, will likely struggle with for much more longer period. India along with other

middle income emerging economies (BRICSAM) are key protagonists of the SDGs, notwithstanding the fact that they have their own domestic task cut out to fine tune the complex and competing goal of eradication of poverty, maintaining growth and environmental sustainability.

Hence, India's development agenda and its priority programs and policies must be in alignment with the Sustainable Development Goals (SDGs), and recent development experience shows that achieving the ambitious vision by 2030 will require addressing a wide range of challenges as discussed in following points.

- **Broad Based Inclusive Economic Growth**

Structural shift of the Indian economy over the years from agriculture to service sector, thus giving a pass to sustainable manufacturing sector, which had the effect of reducing the role of growth as a channel of poverty reduction needs to be addressed. Adoption of sustainable agriculture practice, foray into high yielding but labour intensive agricultural commodities, to generate employment and economic return; enhancing the backward and forward linkages between the agricultural sector and the non-farm sector in order to create a virtuous cycle of growth of incomes and employment will be key to reduce inequality, remove hunger while putting least pressure on eco-system. Skill building, expanding manufacturing base with productive employment, encouraging small and medium enterprises,

implementing the 'Make in India' program by leveraging the large domestic market taking the demographic advantage and huge defence sector can contribute substantially to poverty reduction through employment generation. Infrastructure development, land reform and labour reform, availability of cheap and easy credit, and enhancing governance and ease of doing business to kick start domestic investment cycle and FDI will unleash the trajectory of growth whose trickle down effect will help in attainment of remaining MDGs. More inclusive growth can be achieved through universalization of the Government's financial inclusion program Pradhan Mantri Jan-Dhan Yojana across the nation, expanding and integrating with micro-finance (MUDRA Bank) and recently launched three social security schemes covering all marginalized sections.

- **Focus on human development**

The sectors in which augmented revenue generated by growth is spend by governments is critical for achieving the SDGs. Among competing need for fund, the investment in human development sectors – such as education, health, livelihood promotion and other basic services, ought to be 1st at the top of the development agenda. In health and education, where India is underperforming must increase spending from 4.05% of its GDP to 8 % to 12% and from present 3% of GDP to 6% respectively as in upper middle and high income countries.

In both health and education, participation of private sector in a massive way in terms of capacity building, technical knowhow, is critical to provide quality, accountable service to the poor and marginalized who can be subsidized through direct cash transfer rather than wasting resources through government run agencies where corruption and poor quality delivery is the norm.

- **Strong design and effective delivery of public goods**

Effective delivery of public goods and services is an area of governance which will be most critical for SDG performance. Effective targeting and delivery of the funds under employment generating MNREGA according to local needs to prepare environmentally sustainable project that would be drought proofing and create basic infrastructure in rural areas and transformation in speed & efficiency of off take of food grains per person through PDS and integration with newly finalized Food Security Program must get priority attention. Another massive transformational change will be the direct delivery of subsidies, which has been started with LPG cylinders, needs to be extended to every sphere of entitlement based program like – food, fertilizers, education, health, etc which will help target the real needy in a effective way and make huge savings in government spending which can be better utilized towards progressive taxation which in turn will go to benefit the poor and just above poverty line population.

- **Resilient & Sustainable Infrastructure**

Infrastructure is another area of major concern towards sustainable development and leaving no one behind. Though the basic infrastructure like all weather motorable roads, electricity and telecommunications are key to delivery of basic services, the same must not come at the cost of damage to environment, forest cover, bio sphere, marine eco system. Development of national waterway will be a play a vital link in that direction. Rural road connectivity, grid power to all villages and hamlets, massive expansion of renewable energy program like solar, wind, bio fuel are essential towards delivering achieving many of the unfulfilled goals.

- **Macro-economic Policy Stance**

For attainment of unfinished MDGs and to move on the path of Sustainable Development Goals which is more ambitious, massive financing will be required and nothing substantial emerged from Adis Ababa in July 2015. With financial volatility still besieging most of the rich nations, developing nations like India have to raise resources internally. Hence, with in the overall inflation-growth trade off, the policies stance can be tuned towards facilitating accelerated economic growth rather than focus solely on inflation targeting. Public investment with environment friendly and locally adapted practices with participation of stake holders is the key to these goals since it

eases supply side constraint, increases capacity, and must be so designed to accrues income gains to the poor while putting least pressure on the environment. With inflation softening to the RBI trajectory for 2016, 2017, a more expansionary counter-cyclical fiscal policy, facilitated by public spending is the need of the hour, combined with appropriate monetary and exchange rate policies.

### **Conclusion**

The single biggest achievement for India from the SDGs agreed upon is that the central focus of the vision-the overarching emphasis on eradicating poverty and hunger and inequality in any form- is in sync with the priorities of the Indian government. It is of very vital importance to India's national development agenda as it gives India required flexibility to frame and achieve national development agenda within the broader framework of SDGs. The debate about the post-2015 framework need not be over the relevance of global targets but about their improved architecture, political will, international effort for financing and technological cooperation and facilitation. Having reviewed the good, the bad and the ugly that beset the MDGs since they were created, this article tries to rekindle the debate over challenges and ways towards achieving the post-2015 agenda. Thus, it can be concluded that India should learn from her experiences of MDG-good or bad and as to how to go forward with SDG focusing on its ways and means and national priorities.

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# Paradigm shift towards Mobile Marketing: A study on Consumer's Perspective

**Ritesh Dwivedi,**

Assistant Professor, Amity Business School,  
Amity University UP, NOIDA  
ritesh\_hariom@rediffmail.com

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## ABSTRACT

*The news, media and advertising is quite immediate in the marketing and business world, nowadays. People login to their Facebook accounts from their mobile devices several times a day, e-mails are sent directly to people's smartphones and so on. Mobile marketing is currently one of the most important tools when it comes to advertising. It provides consumers time and location sensitive information that is personalised for them, promoting goods, services and ideas. This research paper discourses the understanding of mobile marketing and the consumer's perception towards it, as well as their comfort level in receiving ads through mobile marketing.*

*Consumers have shown dissatisfaction when it comes to receiving commercial messages on their mobile and suggested that they will accept this only when it is relevant to them and the number of messages sent to them are reasonable. This study has tried to identify the possible factors that are liked and disliked by the consumer in India and other countries so that companies can run their mobile marketing campaigns as per the consumer's preferences.*

**Keywords:** Mobile Marketing, Digital Marketing, Mobile Consumer, Consumer Perception

## 1. Introduction

Mobile marketing is currently one of the most important tools when it comes to advertising, promotion and good business. Mobile marketing conceptually means promoting goods, services and ideas using mobiles and nowadays it has become a necessary medium of marketing although there are reservations about its usage.

Mobile communication technology makes the instant correspondence possible and it permits expanded portability and services even to remote zones. Because of remote communication framework, mobile telephone clients can get to their messages, emails, search for information and purchase items from all around without computer devices (Yen and

Chou, 2000; Aungst and Wilson, 2005). Now that we have Data Services, Short Message Services (SMS), Multimedia Message Service (MMS), Mobile Internet, and so on, mobile is quickly turning into a practical business marketing station.

Positive industry changes have moved marketing spending plans toward mobile. Despite the brand or organization, a mobile marketing technique must be actualized on the grounds because not doing as such would give the opposition a noteworthy benefit. Before the end of 2014, mobile publicizing spoke to almost ten percent of all media promotion spending, surpassing daily papers, magazines, and radio interestingly. What makes mobile marketing one of a kind is that it is dependably on, and, all things considered, gives advertisers the steady chance to convey drawing in substance, messages, and a positive client experience. Brands ought to consider working with organizations whose incorporation mastery

can inventively align digital and online networking marketing with all other promoting endeavours. Despite the fact that organizations are putting intensely in mobile business and mobile marketing, the nature and ramifications of this channel have yet to be completely comprehended and research should be performed to know into how to use it in the best way (Bauer et al., 2005).

According to the latest report from IAMAI, titled **Mobile Internet in India 2016**, the country is estimated to have 371 million mobile internet users by June 2016. India will attract 65 million new mobile internet users coming on board during the period of six months, ending June 2016. Putting these growth figures of mobile internet users in India along-side the total number of internet users in India, mobile emerges as the clear winner. According to the previous report from IAMAI, the number of total internet users in India will reach 462 million mark by June 2016, a 31% year on year growth during the first

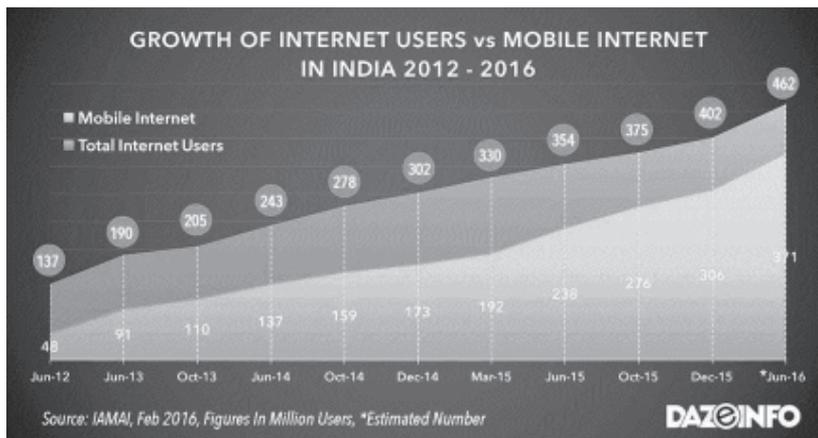


Figure 1

half of 2016. The percentage, however, is way below than the estimated 56% year on year growth in the number of mobile internet users in India during the same period. (Source: <http://dazeinfo.com/2016/02/08/mobile-internet-users-in-india-2016-smartphone-adoption-2015/>)

## **1.1 MAJOR BRANDS USING MOBILE MARKETING**

### **BMW**

Numerous worldwide auto producers have made a decent passage into mobile marketing, the most remarkable being BMW, which has attempted various incredible mobile marketing ventures. To offer more snow tires in fall 2008, BMW tire based in Germany sent tweaked MMS messages to every BMW owner explored from their client database. The message helped beneficiaries to remember the significance of snow tires in awful driving conditions. It had a customized welcoming, suggested a particular tire for their auto, gave the cost, and recorded dealerships in their general vicinity. The crusade accomplished 30% transformation rate, which is undoubtedly owing to the focused on nature of the offer to their rundown of beneficiaries.

### **STARBUCKS**

Starbucks is another organization that grasped mobile marketing early. Starbucks attempted various diverse crusades, however in 2009; it propelled a mobile devotion battle in Mexico that saw gigantic achievement. It began with postcards that

urged the beneficiary to message “Starbucks” to a short code. At the point when clients messaged in, they got a 2D standardized tag (QR codes) coupon that could be checked off the telephone in the Starbucks bistros. The offer changed every time the scanner tag was checked, so beneficiaries were urged to recover the coupon different times. Starbucks encounters a 60% recovery rate on the primary reclamation of the coupons, and the program created an engaged audience of recipients.

### **NASCAR**

NASCAR is another huge brand that has had gigantic accomplishment with mobile marketing. NASCAR has gone in an alternate course, working specifically with the transporters, for example, Sprint to give fans uncommon NASCAR highlights on a few handsets that Sprint offers. NASCAR has likewise had accomplishment with content informing and ring tone downloads, and additionally Bluetooth area based marketing at races. NASCAR has incorporated mobile marketing with TV telecasts amid races and with its marked reality appears, NASCAR Angels.

Also, NASCAR has explored different avenues regarding mobile microsites devoted to helping its crowd spare gas. This task has incorporated a mobile coupon component that gave members rebates at Exxon Mobile and Auto Zone.

## 2. RISE OF MOBILE MARKETING IN RURAL INDIA

11% of India's Internet users live in rural areas. The rise of e-commerce, social media and smart education has already encouraged the rural consumer to go online. Disruption in traditional models of banking, insurance, and governance will promote will increase the relevance and penetration of Internet. A shift to a low-carbon economy, ways to connect farmers and ease of payments and business will mean that rural economy needs to be included and brands should prepare for this change. (Source: <http://www.livemint.com/Consumer/6zf5fb1va3fhhbr7n73g6l/In-India-digital-would-mean-more-of-mobile-in-2016-Study.html>)

The latest IAMA report highlights that **71% of the estimated 371 million mobile internet users in India will belong to urban area.** However, the rural area still holds an enormous potential to

drive the future growth of mobile internet in India. In 2015, the number of mobile internet users from rural area doubled from 2014 and in 2016 the growth percentage is estimated to outclass all the previous figures.

As the number of mobile internet users is increasing with each passing year, mobile users in India are becoming more data hungry. In 2015, the share of mobile internet spending in the average monthly bill rose to 64% from 54% in the previous year. However, this has a clear impact on the cost of accessing mobile data that fell about 18% in 2015. These changes can be attributed to the fact that with the improving mobile infrastructure and the availability of improved high-speed 3G and 4G connectivity, people are shifting to apps and internet for most of their activities. The dependency on Voice call has been reduced and people rather prefer the internet on their mobile phone to make more informed decisions.

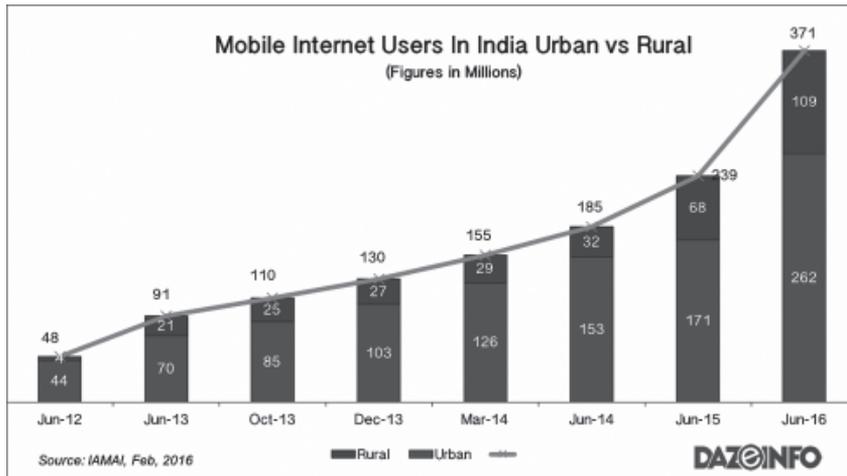


Figure - 2

In Tier 2/ 3 cities of India the consumption of mobile video content is much higher than those from urban India. According to the latest report from Cisco, Mobile video traffic in India will grow at 83% CAGR between 2015 and 2020. Video content will account for nearly 50% of total mobile data consumption in India by 2017. The report from IAMAI emphasizes on the fact that 52% of internet users from rural areas access the internet for the prime purpose of entertainment, followed by 39% for social media and 37% for communication. Interestingly, m-commerce fails completely to lure mobile users in rural areas. As rural India has been clocking more than 100% year on year growth in the number of mobile internet users and publishers are focusing more on creating video content in entertainment category nowadays, the total consumption of mobile data in the rural area would soon outpace urban India.

(Source: <http://dazeinfo.com/2016/02/08/mobile-internet-users-in-india-2016-smartphone-adoption-2015/>)

### **3. REVIEW OF LITERATURE**

A study done by Heinonen & Strandvik (2003) showed that mobile channels are perceived to be more personal than traditional and e-mail channels. This creates high expectations for the relevance of marketing communication messages. A consumer expects messages to be personal and of high interest and this makes the disappointment greater when they get

undesired messages. Mobile advertising may even step over the line of discretion and invade consumers' privacy because of the personal nature of the mobile device. The channel influences consumer responsiveness to marketing communication by being perceived as either disturbing or acceptable (Abernethy 1991). If the consumer considers marketing communication via a channel as disturbing it may negatively affect the attention to and perception of the message. In contrast, the channel may also enhance the acceptance of the marketing communication if it is perceived as appropriate for the specific marketing communication.

Direct marketing now has reached a critical stage where innovative tools are being used to communicate the message without consent of consumer. Initial phases gave rich output in terms of advertising but now consumer has started showing its dislike for this intrusion. Consent marketing was presented as another administrative methodology in marketing communication. It has been contended that organizations advantage from persuading shoppers' consent to be reached (Marinova, Murphy and Massey 2002).

Authorization from the shopper would resolve the challenges to access the customer. Authorization is, nonetheless, not as a matter of course an assurance that the buyer focuses; it is just an entryway opener and gives a sign of the shoppers' potential interest zones.

Krishnamurthy (2001) additionally proposes a calculated system for overseeing internet promoting utilizing the consent marketing approach. Consent marketing requires the buyer to take an interest in the project by giving the authorization and the data for proceeding with the relationship. The enthusiasm for this investment emerges from the equalization of advantages (message significance and money related advantages) and costs (individual data, message preparing costs, security costs) for purchasers.

While trying to cash in on this day by day increasing trend of mobile marketing, it is important to study how consumers perceive this advertising. The major determinants that formulated the attitude of consumers pertaining to in-app advertising were found to be: involvement with the app, hindrance caused by the ad, screen size, contextualization, personalization, relevance, credibility, permission, control and incentives (Bhave et al 2013).

The key to use shared wireless media to offer customers with time and location sensitive, personalized information that promotes goods, services and ideas, thereby generating value for all stakeholders (Dickinger et al. 2004). Barwise & Strong (2002) take up the flexibility, and time-based nature but also the fact that the small screens restrict the

length of the message. Barnes (2002) stresses the interactive nature of mobile advertising and the ability to use contextual information to target the messages to individual receivers, in other words to personalize the message. Location-aware advertising messages are creating five to ten times higher click-through rates compared to traditional internet advertising messages (Ververidis & Polyzos 2002).

#### **4. RESEARCH METHODOLOGY**

Study analyses the rise of mobile marketing in urban and rural areas and which is then compared with global perspective to know the status of mobile marketing in rest of the world. The study in rural India is qualitative work done through secondary sources whereas the study done in urban India and rest of the world has been carried out with the help of primary research amongst people with a sample size of 120 respondents consisting of the students and recent pass outs of Indian Universities. 60 respondents are from in and around Delhi as well as rest 60 are from other countries. Objectives of the study are:

- To assess the level of satisfaction of people towards the mobile marketing.
- To understand the consumer's perspective on mobile marketing.
- To compare the consumer perception towards mobile marketing in India and abroad.

**Table 5.1** Demographics of Indian Respondents

<b>AGE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
Below 16	0	0%
16 to 25	56	93.3%
26 to 35	4	6.7%
36 to 45	0	0%
46 to 55	0	0%
Above 55	0	0%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>
<b>OCCUPATION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
Self-employed	4	6.7%
Student	47	78.3%
Job	2	3.3%
Working Professional	5	8.3%
Homemaker	2	3.3%
Other	0	0%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>
<b>GENDER</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
Male	30	50%
Female	30	50%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>

**Table 5.2** Demographics of Global Respondents

<b>AGE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
Below 16	0	0%
16 to 25	54	90%
26 to 35	6	10%
36 to 45	0	0%
46 to 55	0	0%
Above 55	0	0%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>
<b>OCCUPATION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
Self-employed	2	3.3%
Student	44	73.3%
Job	0	0%
Working Professional	13	21.7%
Homemaker	0	0%
Other	1	1.7%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>
<b>COUNTRY</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
USA	11	18.3%
Mexico	5	8.3%
Canada	2	3.3%

Puerto Rico	3	5.0%
Pakistan	5	8.3%
South Korea	3	5.0%
China	5	8.3%
Taiwan	5	8.3%
Brazil	5	8.3%
Japan	6	10.0%
Gibraltar	3	5.0%
Kyrgyzstan	4	6.7%
Hong Kong	3	5.0%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>

## 5. DATA ANALYSIS

### 5.1 DEMOGRAPHIC INDICATORS

The age of both Indian and Global respondents is in between 16 to 35 while majority of them are in 16 to 25 age group. The sample size of Indian respondents is divided equally as males and females (i.e.,

50% males and 50% females). Majority of respondents in both the questionnaires are Students, followed by Working Professionals. The 60 global respondents are from 13 countries – 11 from USA and average of 4 from rest of the countries.

### 5.2 NUMBER OF PEOPLE RECEIVING ADVERTISEMENTS ON MOBILE

**Table 5.3** Indian Respondents

YES/NO	FREQUENCY	PERCENTAGE
No	2	3.3%
Yes	58	96.7%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>

**Table 5.4** Global Respondents

YES/NO	FREQUENCY	PERCENTAGE
No	5	8.3%
Yes	55	91.7%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>

In India, 97% of the respondents said they receive advertisements while among global respondents, 92% receive advertisements. Therefore, it can be

inferred that people not receiving advertisements either get filtered messages from their service provider or they pay money to not receive any ads.

5.3 NUMBER OF PEOPLE ALLOWING PUSH NOTIFICATIONS ON MOBILE

**Number of people allowing push notifications on mobile**

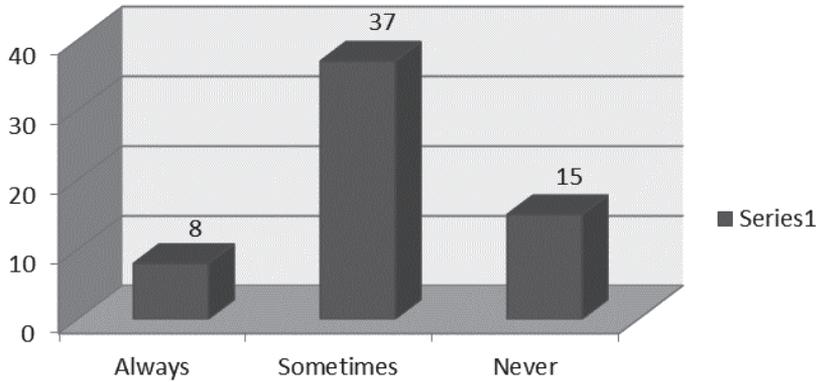


Figure 5.1 Indian Respondents

**Number of people allowing push notifications on mobile**

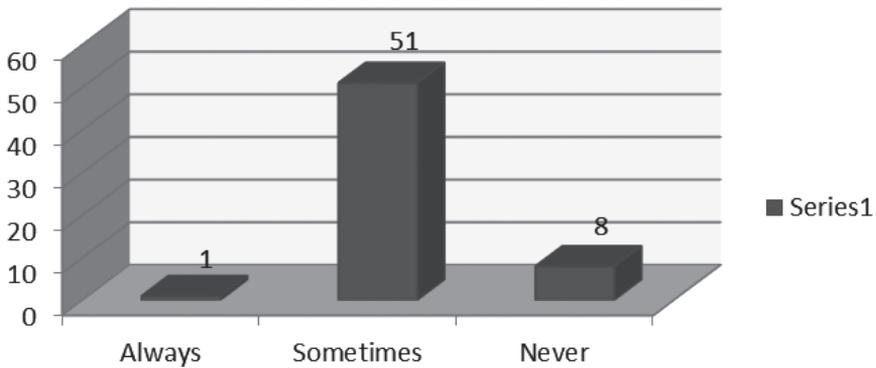


Figure 5.2 Global Respondents

75% of the Indian respondents and 87% of the Global respondents said they allow push notifications on their mobile whereas rest of them never allow the push notifications. If compared from the

previous question, it can be inferred that 22% of the Indian respondents and 5% of the Global respondents receive either SMS or Voice advertisements.

## 5.4 ACCEPTANCE OF ADVERTISEMENTS IF SENDERS SEEK PRIOR PERMISSION

**Table 5.5** Indian Respondents

YES/NO	FREQUENCY	PERCENTAGE
No	8	13.3%
Yes	52	86.7%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>

**Table 5.6** Global Respondents

OPTIONS	FREQUENCY	PERCENTAGE
No	3	5%
Yes	57	95%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>

87% of the Indian respondents are not comfortable receiving advertisements even if the senders seek prior permission from them, whereas only 5% of the global respondents are uncomfortable receiving advertisements after they have given permission to the sender. As per the study done by Marinova, Murphy and Massey in 2002 (Refer Page 5) it is easier

to access consumers if their permission is taken before sending them the commercial messages. This has been proven true with these responses. Also, it shows that people in rest of the world are more welcoming towards information regarding new offers or products once their permission has been taken.

## 5.5 BENEFITS OF ACCEPTING ADVERTISEMENTS ON MOBILE

**Table 5.7** Indian Respondents

BENEFITS	FREQUENCY	MEAN
Offers discount	38	0.63
Instant Awareness	37	0.62
Easy to share message	14	0.23
Other	0	0.00

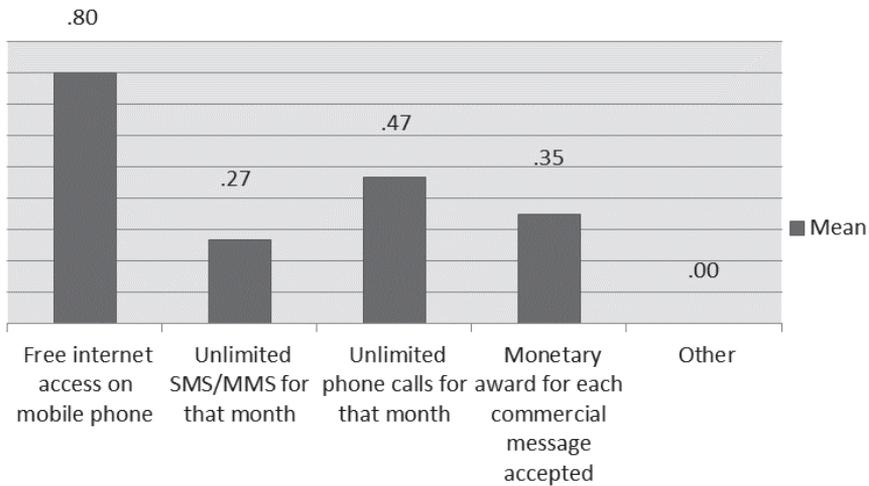
**Table 5.8** Global Respondents

BENEFITS	FREQUENCY	MEAN
Offers discount	37	0.6
Instant Awareness	29	0.48
Easy to share message	18	0.30
Other	0	0.00

Discount Offers is the benefit that maximum number of respondents receive through mobile marketing advertisements, closely followed by Instant Awareness which pretty true in case of mobile advertisements

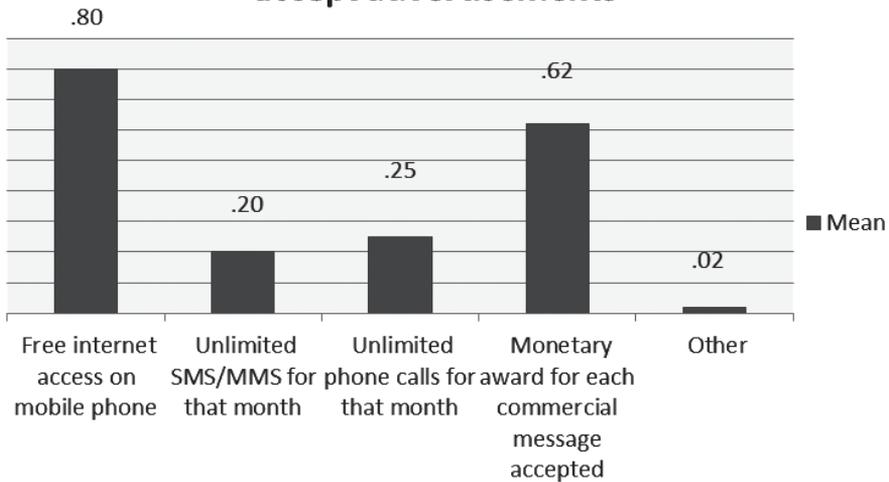
**5.6 INCENTIVES THAT CAN ENCOURAGE PEOPLE TO ACCEPT ADVERTISEMENTS**

**Incentives encouraging people to accept advertisements**



**Figure 5.3** Indian Respondents

**Incentives encouraging people to accept advertisements**



**Figure 5.4** Global Respondents

In the Indian survey, maximum number of respondents would like get Free Internet access as incentive to allow receiving advertisements on their mobile, closely followed by Unlimited Calls. Maximum num-

ber of global respondents also chose to get Free Internet access; however, the second best incentive they chose was a Monetary Award.

## 5.7 PREFERENCE MATRIX

**Table 5.9** Indian Respondents

		PREFERENCE MATRIX					
		MEAN					
STATEMENTS	FACTORS	VALUES	1	2	3	4	5
It is likely for me to accept mobile marketing if the marketing messages provide information value to me.	Information Value	2.4	18.30%	38%	28.30%	15%	0%
It is likely for me to accept mobile marketing if my mobile service provider monitors and filters the messages.	Filtered Messages	2.45	21.70%	28.30%	33.30%	16.70%	0%
It is likely for me to accept mobile marketing if the number of messages sent to me are reasonable.	Reasonable No. of Messages	2.58	8.30%	40%	37%	15%	0%
If I am satisfied with a product/service, I am likely to share with my family/friends.	Share if Satisfied	2.53	15%	36.70%	33.30%	10%	5%
If I am dissatisfied with a product/service, I am likely to share with my family/friends.	Share if Dissatisfied	2.8	15%	23.30%	36.70%	16.70%	8.30%
I am afraid I will receive spam messages if I agree to accept advertising message on mobile phone.	Receive Spam Messages	2.38	21.70%	35%	28.30%	13.30%	1.70%

As per the mean values, reasonable number of messages with a mean of 2.58 is being selected by the sample size of 60 Indian respondents. This indicates that 40% of people are in favour mobile marketing only if the sender sends reasonable number of messages.

Another factor “Information Value” got 38% in 2 point scale which is a positive response.

The above graph shows the comparison of all the 6 factors together worth their highest ranks, for instance, first is “reasonable no. of messages” with 40%.

Second is “information value” with 38%, third is “share if satisfied” with 36.7% on 2 point scale. Fourth is “share if dissatisfied” with 36.7% on 3 point scale which is a neutral response. Fifth is “receive spam messages” with 35% on 2 point scale and sixth is “filtered messages”

with 33.3% on 3 point scale. This indicates that people wish to receive reasonable number of messages in a day. Therefore, companies should take care of this factor while sending promotional messages to people.

**Table 5.10** Global Respondents

			PREFERENCE MATRIX				
MEAN							
STATEMENTS	FACTORS	VALUES	1	2	3	4	5
It is likely for me to accept mobile marketing if the marketing messages provide information value to me.	Information Value	3.18	5%	30%	26.7%	18.3%	20%
It is likely for me to accept mobile marketing if my mobile service provider monitors and filters the messages.	Filtered Messages	2.77	16.7%	18.3%	41.7%	18.3%	5%
It is likely for me to accept mobile marketing if the number of messages sent to me are reasonable.	Reasonable No. of Messages	3.13	13.3%	18.3%	20%	38.3%	10%
If I am satisfied with a product/service, I am likely to share with my family/friends.	Share if Satisfied	2.52	20%	43.3%	11.7%	15%	10%
If I am dissatisfied with a product/service, I am likely to share with my family/friends.	Share if Dissatisfied	2.7	26.7%	31.7%	8.3%	11.7%	21.7%
I am afraid I will receive spam messages if I agree to accept advertising message on mobile phone.	Receive Spam Messages	2.18	51.7%	13.3%	15%	5%	15%

As per the mean values, information value with a mean of 3.18 is being selected by the sample size of 60 Global respondents. However, if we look at the responses according to the percentage from scale 1-5, “Receive spam messages” was selected the most by 51.7% of the global respondents on 1 point scale which means strongly positive response. That means 51.7% of the respondents do not

favour mobile marketing as they are afraid to receive spam messages.

Another factor “Share if satisfied” got 43.3% in 2 point scale which is a positive response.

The above graph shows the comparison of all the 6 factors together worth their highest ranks, for instance, first is “receive spam messages” with 51.7%.

Second is “share if satisfied” with 43.3%, third is “filtered messages” with 41.7% on 3 point scale which is a neutral response. Fourth is “share if dissatisfied” with 31.7% on 2 point scale. Fifth is “Information value” with 30% on 2 point scale and sixth is “reasonable number of messages” with

38.3% on 4 point scale which is a negative response.

This indicates that people need information that is of much value to them, to accept the ads. Also, they are afraid to receive spam messages, unlikely of Indian respondents.

## 5.8 ANALYSIS OF VARIOUS MODES OF RECEIVING ADS

### Analysis of various modes of receiving ads

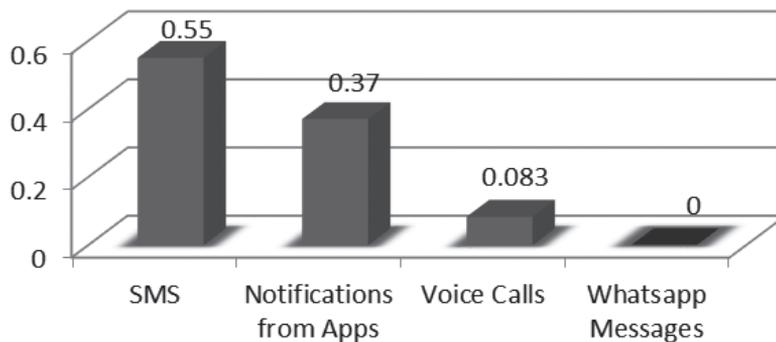


Figure 5.5 Indian Respondents

### Analysis of various Ad forms

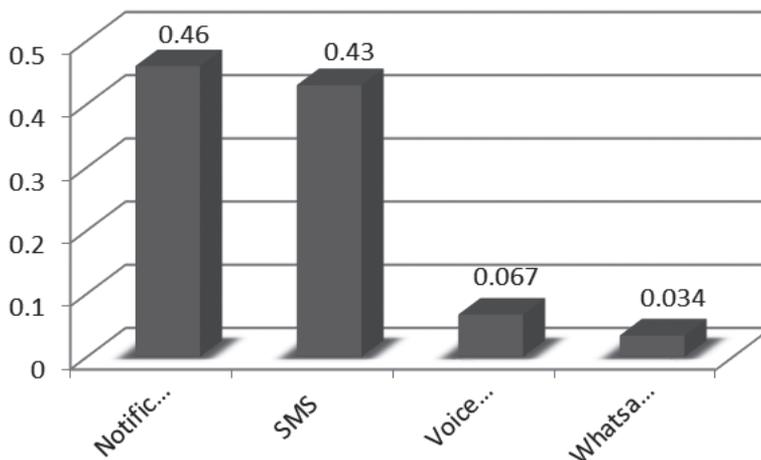


Figure 5.6 Global Respondents

This is a rank analysis of various modes of receiving Ads. Indian respondents receive ads mostly through SMS (55%) and Notifications from Apps (36.7%). Therefore, Rank I is taken by SMS and Rank II by Notifications from Apps.

Global Respondents receive ads mostly through Notifications from Apps (46.7%) and SMS (43.3%). Therefore, Rank I is taken by Notifications from Apps and Rank II is taken by SMS.

Voice Calls and Whatsapp Messages got Rank III and Rank IV respectively in both India and abroad.

## 5.9 RELATIONSHIP BETWEEN OCCUPATION AND PERMITTING PUSH NOTIFICATIONS ON MOBILE

**Table 5.11** Indian Respondents

PARTICULARS Occupation	Allowance to push notifications from apps		
	ALWAYS	SOMETIMES	NEVER
Self-Employed	2%	0%	5%
Student	10%	52%	17%
Job	0%	3%	0%
Working Professional	2%	3%	3%
Homemaker	0%	3%	0%
Other	0%	0%	0%

**Table 5.12** Global Respondents

PARTICULARS Occupation	Allowance to push notifications from apps		
	ALWAYS	SOMETIMES	NEVER
Self-Employed	0%	2%	2%
Student	2%	67%	5%
Job	0%	0%	0%
Working Professional	0%	17%	5%
Homemaker	0%	0%	0%
Other	0%	0%	2%

Amongst Indian respondents, most students have chosen the midway to this question saying they allow push notifications sometimes. Self-employed people, however, are extremists. While 2% said they always allow push

notifications (can be news), 5% said they never allow push notifications. Global respondents are diplomatic and said they allow push notifications sometimes, depending on the App and its usefulness.

### 5.10 RELATIONSHIP BETWEEN LEVEL OF COMFORT IN RECEIVING ADS AND PAYMENT OF MONEY FOR REMOVING ADS

#### Never paid money to remove ads

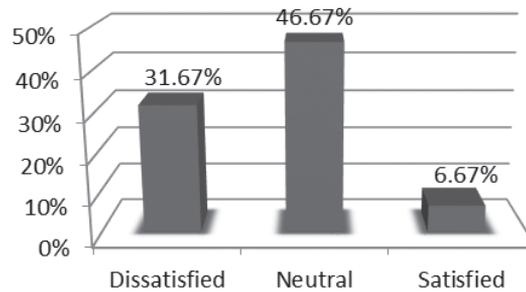


Figure 5.7 Indian Respondents

#### Paid Money to remove ads

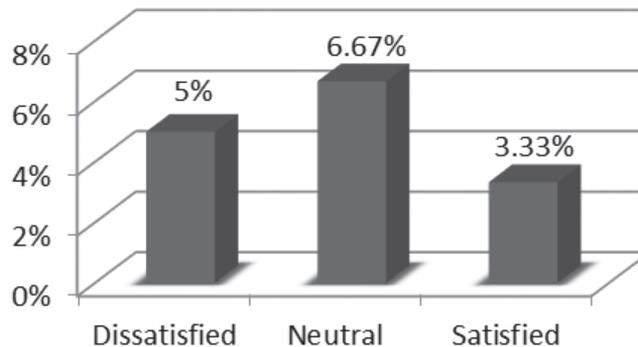


Figure 5.8 Global Respondents

31.67% of the Indian respondents have never paid money to remove ads and are therefore, dissatisfied in receiving commercial messages on mobile. 46.67% of the respondents stand neutral and 6.67% are satisfied. Whereas, 3.33% of the respondents who have paid money to remove ads are satisfied with the ads they receive on mobile. However, 5% of the ones who have paid

money are still dissatisfied. Surprisingly in the global survey, none of them who have paid money to remove ads are satisfied with the advertisements they receive on mobile. Also, 58.3% of the respondents who have never paid money are dissatisfied, with only 5% being satisfied. Probably, 5% are the ones who don't bother about the commercial messages they receive.

### 5.11 RELATIONSHIP BETWEEN FORM OF RECEIVING ADS THAT DISTURBS AND INCENTIVES FOR ACCEPTING ADS

**Table 5.13** Indian Respondents

PARTICULARS	Disturbing Form of receiving advertisements			
	Notifications from Apps	SMS	Voice Calls	Whatsapp Messages
Incentives to accept ads				
Unlimited SMS/MMS for that month	11.67%	6.67%	5%	3.33%
Monetary award for each commercial message accepted	11.67%	11.67%	8.33%	3.33%
Unlimited phone calls for that month	15%	16.67%	13.33%	1.67%
Free internet access	25%	28.33%	25%	1.67%
Other	0%	0%	0%	0%

**Table 5.14** Global Respondents

PARTICULARS	Disturbing Form of receiving advertisements			
	Notifications from Apps	SMS	Voice Calls	Whatsapp Messages
Incentives to accept ads				
Unlimited SMS/MMS for that month	5%	8.30%	6.7%	0%
Unlimited phone calls for that month	13.3%	5%	6.7%	0%
Monetary award for each commercial message accepted	25%	15%	13.3%	8.3%
Free internet access	41.7%	15%	15%	8.3%
Other	0%	0%	0%	0%

Amongst the Indian respondents, 25% of the people who get disturb most by the Notifications from Apps said they are willing to accept those ads if they are given free internet access as incentive, followed by unlimited phone calls. Similar is the case with people who get disturb most by SMS (28.33%) and Voice Calls (25%). However, 3.33% of the respondents who get disturb most by whatsapp ads are willing to accept them if they get unlimited SMS/MMS and monetary award.

In the global survey, respondents getting disturbed from any of the four mediums of receiving commercial messages look for free internet access as incentive followed by monetary award for accepting each commercial message.

### 3. OBSERVATIONS AND FINDINGS

Major findings are listed below:

- Conducting this survey with Indians and people from 13 other countries was a good choice as it gave a broader aspect to the study and comparing the

Indian mobile market scenario with that of the world was much easier.

- In India, 97% of the respondents said they receive advertisements while among global respondents, 92% receive advertisements. Therefore, it can be inferred that people not receiving advertisements either get filtered messages from their service provider or they pay money to not receive any ads.
- 87% of the Indian respondents are not comfortable receiving advertisements even if the senders seek prior permission from them, whereas only 5% of the global respondents are uncomfortable receiving advertisements after they have given permission to the sender. This shows that people in rest of the world are more welcoming towards information regarding new offers or products once their permission has been taken.
- Discount Offers is the benefit that maximum number of respondents receive through mobile marketing advertisements, closely followed by Instant Awareness which pretty true in case of mobile advertisements. Thus, companies mostly offer discounts when they send a commercial message to a person.
- In the Indian survey, maximum number of respondents would like get Free Internet access as incentive to allow receiving advertisements on their mobile, closely followed by Unlimited

Calls. Maximum number of global respondents also chose to get Free Internet access; however, the second best incentive they chose was a Monetary Award.

- This survey revealed that the 3 most important factors in making people accept the advertisements on their phone are – Giving free internet access to them, unlimited phone calls and monetary awards for each commercial message.
- The 2 most common modes of receiving advertisements in India and rest of the world are Notifications from Apps and SMS.

#### 4. CONCLUSION

Mobile Marketing is the most used technique of informing consumers by the companies, which soon might be replaced by other technology in the digital world. Many of the e-commerce companies have now turned to only mobile functional i.e., earlier they had websites where people used to shop but then they shifted to only mobile applications. One notable example is Myntra.

The primary survey conducted for the purpose of analysing the consumer's perspective on mobile marketing in India and 13 other countries gave pretty good information of the satisfaction level of customers. The survey results reveal that people are not very happy with receiving too many commercial messages on their phone. A study done by Heinonen & Strandvik in 2003 says that a mobile

phone is considered a device for personal use and generally nobody prefers to be disturbed with irrelevant advertisements. This has been proved true with the responses in this survey and the case has been same with the respondents of almost all the countries.

As per the study done by Marinova, Murphy and Massey in 2002 it is easier to access consumers if their permission is taken before sending them the commercial messages. This study has also been proven true through this survey. 87% of the Indian respondents and 95% of the global respondents said they would happily accept receiving advertisements if the sender takes prior permission from them.

## **5. RECOMMENDATIONS**

Companies using mobile marketing as a tool for advertising their products and services should take prior permission from the consumers before sending the commercial notifications or messages. This way, the consumer will select only relevant categories and would genuinely pay attention to whatever the company sends on their mobile.

Companies should make sure they do not send too many messages to the existing or potential customer as this can be annoying. People have preferred to receive reasonable number of messages in a day.

Moreover, sending an email is always a better option than an SMS. Since, mobile is considered a personal device, people generally don't prefer to receive too many SMS or Notifications from the Apps

installed. Therefore, most of the messages sent through these mediums go unnoticed.

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# Application of Bayesian Credibility Theory in Movie Rankings to Reduce Financial Risk of Production Houses

**Palash Ranjan Das**

Dept of Applied Mathematics, University of Calcutta, Kolkata  
palash.iitm@gmail.com

**Tripti Chakrabarti**

Dept of Applied Mathematics, University of Calcutta, Kolkata  
triptichakrabarti@gmail.com

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## ABSTRACT

*Credibility theory is a branch of actuarial science devoted to quantify how unique a particular outcome will be compared to an outcome deemed as typical.*

*In this paper, we will examine the application of the principles of Bayesian Credibility Theory in rating and ranking movies by a premier online movie database based on user's votes. Although the Bayesian credibility theory was developed originally as a method to calculate the risk premium by combining the individual risk experience with the class risk experience, it is generic enough to deal with a wide range of practical applications quite different from the classical application mentioned above. One such diverse application of the theory in an unlikely domain will be discussed in this paper.*

**Keywords:** *Credibility Theory; Prior distribution; Likelihood function; Posterior distribution; Loss function; Bayesian approach*

## Introduction

Undoubtedly, the financial risk is a primary characteristic of the motion picture industry-prediction of demand is notoriously difficult and almost all costs are incurred before any demand is realized. Thus to suggest an appropriate financial strategy is the key variable that shapes the film industry. It thus became necessary for

production houses to consult a reliable database of movie rankings so that they can co-finance a motion picture by considering its ranking on the basis of user's votes. Simultaneously, it became imperative for movie databases to rank the movies using robust statistical techniques so as to avoid any controversy regarding

these rankings, the whole process being statistically sensitive in nature.

In this paper, we will analyse the statistical approach adopted by a well-known online movie database in rating and ranking movies based on user's votes and will argue on the superiority of its approach over other traditional unsophisticated straightforward approaches known so far, thereby reducing the risk of haphazard and unscientific rating of movies. This makes the database more reliable among the production houses which can now consult it freely to finance a movie thereby laying more importance on the public's opinion about box office hits through user's votes.

This minimizes their risk of financially backing unproductive movies whose ranking based on user's votes do not seem satisfactory. Thus it is almost certain that such movies will flop in the movie business market and producing them is financially hazardous. So production houses can accept or decline to financially back a movie on the basis of its ranking by some reliable movie database. As mentioned earlier, this substantially reduces the financial risk associated with the production in movie business industry.

The paper is organized as follows: Literature review on credibility theory and objectives of this study are followed by an overview of IMDb, a well-known online movie database and the process by which it rates and ranks movies is discussed. It is followed by explaining the statistical formula adopted by IMDb for

calculating the Top Rated 250 titles and the similarity in the formula adopted with the Bayesian credibility theory formula used by actuaries of insurance companies to calculate premiums. Thereafter, we discuss Bayesian estimation in general and its use in determining credibility estimates. Subsequently, application of credibility estimates in movie rating problem is presented and analysed in details. Further a comparison between the classical premium pricing insurance risk problem and the movie rating problem is shown in the form of a table. Numerical results and findings are then presented. Finally the conclusion is offered along with scope for further research.

### **Literature Review**

In actuarial parlance the term 'credibility' was originally attached to experience rating formulae that were convex combinations (weighted averages) of individual and class estimates of the individual risk premium. Credibility theory thus was the branch of insurance mathematics that explored model-based principles for construction of such formulae. The development of the theory brought it far beyond the scope so that in today's usage credibility covers more broadly linear estimation and prediction in latent variable models.

The origin and advent of credibility theory dates back to Whitney [11] who in 1918 addressed the problem of assessing the risk premium 'm', defined as the expected claim expenses per unit of risk

exposed for an individual risk selected from a portfolio (class of similar risks). Incorporating and advocating the combined use of individual risk experience and class risk experience, he proposed that the premium rate be a weighted average of the form:

$$\bar{m} = z * \hat{m} + (1-z) * \bar{i}$$

Where, ' $\hat{m}$ ' is the observed mean claim amount per unit of risk exposed for the individual contract and ' $\bar{i}$ ' is the overall mean in the insurance portfolio.

Whitney viewed the risk premium as a random variable. In terms of modern credibility theory, it is a function of  $m(\hat{\epsilon})$  of a random element  $\hat{\epsilon}$  representing the unobservable characteristics of the individual risk. The random nature of  $\hat{\epsilon}$  signifies and expresses the notion of heterogeneity, the individual risk is a random selection from a portfolio of similar but not identical risks and the distribution of  $\hat{\epsilon}$  describes the variation of individual risk characteristics across the portfolio. It is to be noted that the weighted ' $z$ ' in the above formula was defined as the credibility factor since it measures the amount of credence attached to the individual experience and ' $\bar{m}$ ' was called the credibility premium.

T.Bauwelinx *et.al* (1991) [6] in their study on loaded credibility premium introduced a new technique for estimating credibility premium risks, containing a fraction of the variance of the risk as

loading on the net insurance premium. This method provides us with another approach to the known results for credibility loaded premiums, not having the drawback of estimating an approximation of the so-called fluctuation part. It also provides us with an elegant extension to loaded premiums in the hierarchical credibility model. The results are obtained in the semi linear hierarchical credibility theory.

E. Gomez-Deniz (2007) [7] considered an alternative to the usual credibility premium that arises for weighted balance loss function. He generalizes the credibility theory by balance loss function and it includes as a particular case the weighted quadratic loss function traditionally used in actuarial science. This function is used to derive credibility premiums under approximate likelihood and priors. Further generalized credibility premiums are obtained that contain as particular cases other credibility premiums.

Jean-Philippe Boucher and Michel Denuit (2007) [9] explored and compared the credibility premiums in zero-inflated Poisson models for panel data. They derived predictive premiums based on quadratic loss and exponential loss. They showed that the credibility premiums of the zero-inflated model allow for more flexibility in the prediction and argued that the future premiums not only depend on the number of past claims but also on the number of insured period with at least one claim. Their model also analysed in another way the hunger for bonus phenomenon.

Harald Dornheim and Vytautas Brazauskas (2010) [8] embedded the classical credibility theory models within the framework of mixed linear models with the objective to develop robust and efficient methods of credibility when heavy tailed claims are approximately log-local-scale distributed. To accomplish that, they expressed additive credibility models as mixed linear models with symmetric or asymmetric errors. They adjusted adaptive truncated likelihood methods and compute highly robust credibility estimates for heavy-tailed claims.

Joseph H.T. Kim and Yongho Jeon (2013) [10] in their study proposed a credibility theory which is based on truncation of loss data, or the trimmed mean. Their proposed framework addresses the classical credibility theory as a special case and is developed on the idea of varying the trimming threshold to investigate the sensitivity of the credibility premium. They showed that the trimmed mean is not a coherent risk measure and investigated some related asymptotic properties of the structural parameters in credibility. They finally showed that the proposed credibility models can successfully capture the tail risk of the underlying loss model, thus providing a better landscape of the overall risk that insurers assume.

This widespread research on credibility theory has opened new avenues of application of the theory hitherto unknown. Thus now, its applications were not only confined to the classical premium

risk problem but also to other diverse fields.

Prasham M. Rambhia (2015) [4] hinted at the application of the theory by IMDb to rank and rate movies based on user's votes. Although detailed calculations and statistical theory is missing in the study, he gave an overall picture of the unusual application of this usual theory known so far. His article was an attempt to examine a diverse application of the credibility theory actuaries encounter in their curriculum to a field that is as different from actuarial science as chalk is from cheese.

With further passage of time we will certainly observe more interesting, myriad and diverse applications of such known statistical theories.

## Objectives

The present study focuses primarily on the approach adopted by IMDb for ranking the Top Rated 250 titles. The ultimate purpose of this research is to study the diverse application of Bayesian credibility theory in movie rating problem thereby exploring new avenues of application of known statistical theories.

The paper primarily aims to:-

1. Examine the financial risk of production involved in movie business industry and how production houses can minimise financial risk by consulting movie ranking database.
2. Study the application of Bayesian credibility theory in movie rankings.

3. Exhibit the similarity in approach of the movie rating problem and the premium calculation problem of insurance companies.
4. Finding the unknown parameter and credibility estimates of the movie rating problem.
5. Demonstrating the formula of WR (the weighted rating) in the form of the credibility estimate. The credibility factor is also shown as the function of number of user's votes ( $v$ ) and minimum number of required votes ( $m$ ).

### IMDb and Movie Ratings:

Internet movie database (abbreviated as IMDb) [1] is a premier movie database which rates and ranks movies based on cinephile votes. Most cinema lovers use it to know movie ratings and collect other ancillary information about movies. Each registered user is eligible to rate each movie. The rating of a movie is done by assigning a positive integer score of 10, where 10 is regarded as the highest score possible. Each such rating is regarded as a 'vote' by an individual registered user. For each movie, the average rating from various individual users (say,  $R$ ) is computed and displayed.

Incorporating the special popular feature 'Top 250' chart of IMDb [2], we are mainly concerned about the theory adopted by IMDb in determining these rankings of movies given that the average ratings of each movies (and other ancillary data like number of votes of each movie, etc) is known.

### Approach adopted by IMDb

A screenshot taken from IMDb [2] reveals the formula adopted by them.

The formula for calculating the Top Rated 250 Titles gives a true Bayesian estimate:

$$\text{Weighted Rating (WR)} = \left(\frac{v}{v+m}\right) * R + \left(\frac{m}{v+m}\right) * C$$

Where:-

$R$  = average for the movie (mean) = (Rating)

$v$  = number of votes for the movie = (votes)

$m$  = minimum number of votes required to be listed in the Top 250 (at present 25000)

$C$  = the mean vote across the whole report (at present 7.0)

*Note:- For the Top 250, only votes from regular voters are considered.*

It is interesting to notice that the weighted rating (WR) used for ranking movies is a weighted average between  $R$  (the movie's own average rating based on user's votes on it) and  $C$  (average rating of all movies). Clearly WR will lie between  $R$  and  $C$ . Also it is worth mentioning that  $R$  and  $C$  are averaged with weights in the ratio  $v : m$ . Hence, a higher value of  $v$  implies more weightage being given to  $R$ , than  $C$ . This is intuitively reasonable as  $R$  is more relevant if  $v$  is large. When  $v$  tends to infinity, the weighted rating (WR) approaches  $R$  which is also intuitively obvious.

The formula of WR can be rearranged and written as:

$$\begin{aligned} WR &= \left(\frac{v}{v+m}\right) * R + \left[1 - \left(\frac{v}{v+m}\right)\right] * C \\ &= Z * R + (1-Z) * C, \text{ where } Z = \left(\frac{v}{v+m}\right) \end{aligned}$$

Thus we see that the weighted rating adopted by IMDb fits exactly to the Bayesian Credibility Theory adopted by insurance companies to calculate risk premiums. Here the credibility factor  $Z = \left(\frac{v}{v+m}\right)$  which is a real number lying between 0 and 1 consistent with the usual theoretical development.

However the discussion appears vague and intuitive without a strong and rigorous statistical foundation which we will deal in the subsequent sections.

### **Bayesian Estimation and its use in determining credibility estimates**

The Bayesian approach to credibility is discussed in this section.

Under the Bayesian framework, the unknown parameter (say,  $\theta$ ) is estimated on the basis of some observed data (say) by involving the following steps:-

#### **Prior parameter distribution**

A prior parameter distribution is adopted to describe the possible values of the unknown parameter under consideration. The form of the prior distribution is derived from the collateral data.

The unknown parameter  $\theta$  is regarded as a random variable which has a specific distribution. Some idea about it is known beforehand without considering the observed data ( $X$ ). We call that the prior distribution of  $\theta$ .

#### **Likelihood function**

For any given value of the parameter, there is a certain probability of incurring the particular pattern observed in the direct data. This determines the likelihood of a given pattern as a function of the unknown parameter.

On the basis of the observed data ( $X$ ) and the probability density function (PDF) of  $\theta$ , we construct the likelihood function  $L(\theta)$ .

#### **Posterior parameter distribution**

The prior parameter distribution is combined with the likelihood function using Bayes' formula to determine a posterior parameter distribution for the parameter.

The Bayes' formula enables us to determine the posterior distribution of  $\theta$  using the observed data  $X$  by the following relationship:

$$\text{Posterior PDF} \propto \text{Prior PDF} * \text{Likelihood}$$

#### **Loss Function**

The loss function quantifies the difference between the true value of the parameter and its estimated one. It shows how serious misjudging the parameter value would be.

We find the Bayesian estimate of the unknown parameter  $\theta$  on the basis of the chosen loss function and the posterior distribution. For the mostly applied 'quadratic error loss', the mean of the posterior distribution is the required optimal Bayesian estimate.

It is to be noted that this Bayesian estimate is regarded as a credibility estimate if it can (after rearrangement) be expressed in the form:-

Z\*Mean based on Sample data + (1-Z)\*Mean of prior distribution

Thus in the movie rating problem, we will make appropriate choices for the prior distribution, the likelihood function and the loss function to obtain the credibility estimate of the above form in the next section.

**Application of Credibility Estimates in movie rating problem**

We will use the Binomial/Beta model to realistically approach the movie rating problem in contrary to the more common Bayesian credibility models such as the Poisson/Gamma model and the Normal/Normal model.

Suppose  $R_j$  denote the individual rating score by the  $j^{th}$  user.

**Likelihood function:**

Let us assume that for  $j=1,2,...,v$ ,  $R_j$  are independent and identically distributed as Binomial(10, p). This distribution is realistic and consistent with the demand of the problem since users can only assign integer scores on a scale of 10. The likelihood function will be dependent on ‘v’ and ‘R’ (used above) and ‘p’ where p is the unknown parameter to be estimated.

The likelihood function is thus written as:

$$L(p) = \prod_{j=1}^v \binom{10}{r_j} p^{r_j} (1-p)^{10-r_j}$$

$$= (\text{constant}) \cdot p^{\sum_{j=1}^v r_j} * (1-p)^{10v - \sum_{j=1}^v r_j}$$

Thus we see that:

$$L(p) \propto p^{\sum_{j=1}^v r_j} * (1-p)^{10v - \sum_{j=1}^v r_j}$$

**Prior distribution:**

‘p’ denoted the probability which can take all real values between 0 and 1. Hence we consider a Beta( $\hat{a}$ ,  $\hat{a}$ ) distribution as a prior. This is because the Beta distribution is the conjugate prior of the Binomial distribution. Particular values of ‘ $\hat{a}$ ’ and ‘ $\hat{a}$ ’ would be functions of ‘m’ and ‘C’, denoted before.

Thus if f(p) is the pdf of the prior then:

$$f(p) = [\{\tilde{A}(\hat{a}) \cdot \tilde{A}(\hat{a})\} / \tilde{A}(\hat{a} + \hat{a})] p^{\alpha-1} * (1-p)^{\beta-1}$$

Thus we see that:

$$\text{Prior distribution} \propto p^{\alpha-1} * (1-p)^{\beta-1}$$

**Posterior distribution**

The posterior distribution is obtained by multiplying the prior probability distribution function with the likelihood function.

Thus we have:

Posterior distribution

$$\begin{aligned} &\propto p^{\alpha-1} * (1-p)^{\beta-1} * p^{\sum_{j=1}^v r_j} * (1-p)^{10v - \sum_{j=1}^v r_j} \\ &= p^{\sum_{j=1}^v r_j + \alpha - 1} * (1-p)^{10v - \sum_{j=1}^v r_j + \beta - 1} \end{aligned}$$

$$\text{Hence,} \propto p^{\sum_{j=1}^v r_j + \alpha - 1} * (1-p)^{10v - \sum_{j=1}^v r_j + \beta - 1}$$

**Posterior distribution**

That is, **Posterior distribution**

$$\propto p^{\sum_{j=1}^v r_j + \alpha - 1} * (1-p)^{10v - \sum_{j=1}^v r_j + \beta - 1}$$

### Loss function

Using the quadratic loss function, the mean of the above posterior beta distribution will be the Bayesian estimate for 'p'. Let us regard it as  $\hat{p}$ .

Thus we have:  $\hat{p} = \frac{\sum_{j=1}^v r_j + \alpha}{10v + \alpha + \beta}$

The expected weighted rating for a Binomial (10, p) distribution would be =  $\widehat{WR} = 10 * \hat{p}$ .

Therefore:  $\widehat{WR} = \frac{10 * \sum_{j=1}^v r_j + 10\alpha}{10v + \alpha + \beta}$

### Calculations

Now, we have from definition of 'R' that  $\frac{\sum_{j=1}^v r_j}{v} = R$

Thus:  $\sum_{j=1}^v r_j = v * R \dots \dots (1)$

Substituting (1) in the expression of  $\sum_{j=1}^v r_j = v * R \dots \dots (1)$ , we get:

$$\begin{aligned} \widehat{WR} &= \frac{10vR + 10\alpha}{10v + \alpha + \beta} \\ &= \left( \frac{10v}{10v + \alpha + \beta} \right) * R + \left( \frac{10\alpha}{10v + \alpha + \beta} \right) \\ &= \left\{ \frac{v}{v + \left( \frac{\alpha + \beta}{10} \right)} \right\} * R + \left\{ \frac{\alpha}{v + \left( \frac{\alpha + \beta}{10} \right)} \right\} \\ &= \left\{ \frac{v}{v + \left( \frac{\alpha + \beta}{10} \right)} \right\} * R + \left\{ \frac{\left( \frac{\alpha + \beta}{10} \right)}{v + \left( \frac{\alpha + \beta}{10} \right)} \right\} * \frac{\alpha}{\left( \frac{\alpha + \beta}{10} \right)} \\ &= \left\{ \frac{v}{v + \left( \frac{\alpha + \beta}{10} \right)} \right\} * R + [1 - \left\{ \frac{\left( \frac{\alpha + \beta}{10} \right)}{v + \left( \frac{\alpha + \beta}{10} \right)} \right\}] * \end{aligned}$$

Thus we have:

$$\widehat{WR} = \frac{v}{v+m} * R + \left\{ 1 - \left( \frac{v}{v+m} \right) \right\} * C$$

$$\text{where, } m = \frac{\alpha + \beta}{10} \quad C = \frac{10\alpha}{\alpha + \beta}$$

Thus the expression of  $\widehat{WR}$  can be rearranged to yield the formula in the form of the credibility estimate as:

$$= \widehat{WR} = 10 * \{ Z * \text{Mean based on Sample data} + (1-Z) * \text{Mean of prior distribution} \}$$

(where  $Z = \frac{v}{v+m}$ )

Thus, here we have the credibility factor

$$Z = \frac{v}{v+m} = \frac{10v}{10v + \alpha + \beta}$$

Also we have the following relations:

$$\hat{a} + \hat{m} = 10m, \quad C = \frac{10\alpha}{m}$$

Hence the parameters ' $\hat{a}$ ' and ' $\hat{m}$ ' are expressed in terms of ' $m$ ' and ' $C$ ' as:

$$\hat{a} = \frac{mC}{10}$$

$$\hat{m} = 10m - \hat{a}$$

$$= 10m - \frac{mC}{10}$$

$$= \frac{100m - mC}{10}$$

Thus we have:  $\hat{a} = \frac{m(100 - C)}{10}$

### Comparison

We provide a comparison between the classical premium pricing of insurance risk problem and the movie rating problem to highlight the similarity of the Bayesian credibility theory approach to two completely different problems in Table 1.

**Table 1**

	Rating movies	Premium pricing of insurance risk	Fitting in the Bayesian Framework
Direct data	Average rating for the particular movie(R)	Average cost of claims for a particular insurance risk(X)	Sample data, its mean
Collateral data	Average ratings for all movies(C)	Average cost of claims for all insurance risks( $\mu$ )	Prior distribution, its mean
Overall rating/price	Weighted average of R and C	Weighted average of X and $\mu$	Posterior mean, credibility estimate
Weights	$\frac{v}{v+m}$ and $\frac{m}{v+m}$	Z and (1-Z)	Credibility factor

**Results and Findings**

The primary source of data is the Internet Movie Database (IMDb), which is accessible on the internet at www.imdb.com. The study period is for the last three months during which IMDb updates its database daily.

The top rated movie for the last three months is ‘The Shawshank Redemption’ which gathers an IMDb ranking of 9.2. In this section, we will calculate how this figure is achieved.

The sample size (number of votes cast in favour of the movie along with breakdown details) is already mentioned in the IMDb webpage [4] and given below as it is.

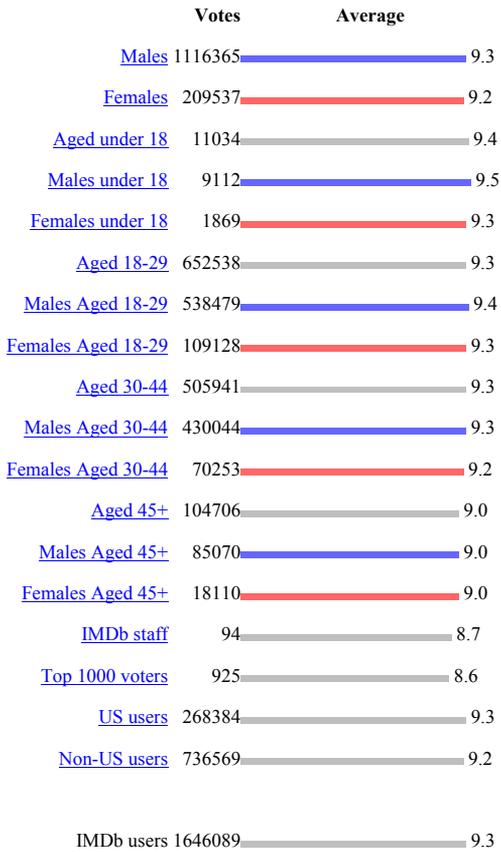
1646089 IMDb users have given a weighted average vote of 9.3 / 10

Demographic breakdowns are shown below.

Votes	Percentage	Rating
923158	56.1%	10
410536	24.9%	9
184472	11.2%	8
60339	3.7%	7
18291	1.1%	6
9196	0.6%	5
4285	0.3%	4
3358	0.2%	3
3244	0.2%	2
29210	1.8%	1

Arithmetic mean = 9.1. Median = 10  
 Ranked #1 in the [Top 250 Movies](#)

This page is updated daily.



So, here using the credibility formula used by IMDb. we have:

$$v = 1646089, m = 25000, R = 9.3, C = 7.0$$

Hence,

$$\begin{aligned} \overline{WR} &= \left(\frac{v}{v+m}\right) * R + \left\{1 - \left(\frac{v}{v+m}\right)\right\} * C \\ &= \left(\frac{1646089}{1646089 + 25000}\right) * 9.3 + \left\{1 - \left(\frac{1646089}{1646089 + 25000}\right)\right\} * 7.0 \\ &= 8.9639 + 0.1047 \\ &= 9.0686, \text{ which is approximately rated by IMDb as } \mathbf{9.3}. \end{aligned}$$

This approximation is due to the consideration of manipulative voting and trimmed means.

It is to be noted that although the actual ranking approach followed by IMDb is more complicated and only an approximation of the actual ranking is followed presently, the Bayesian framework provides a necessary tool to tackle the basic problem of actual ranking. The complexity arises from the fact that IMDb now treats votes from different users differently (for tackling manipulative voting) and uses trimmed means[9] (to minimise influence of outliers).[3]

### Conclusion

The approach adopted by IMDb is more robust than any other statistical approach known so far in rating and ranking movies as it considers both the likelihood function of the individual rating scores and the prior distribution of the unknown parameter ‘p’, thereby reducing the risk exposure due to anomalous rating using straightforward and unsophisticated approaches.

Thus for calculating the Top Rated 250 titles based on user’s votes, it considers the weighted rating which is actually a true Bayesian estimate calculated using the credibility approach by applying it on both the direct data (average rating based on user’s votes) and the collateral data (mean number of votes across the whole report) and finally finding a suitable credibility factor. The robustness of this approach is best understood when we compare it with the following two layman’s approach of ranking movies.

Layman’s approach-1:

Consider the approach of rating all the movies in descending order of their average rating. This approach is simple and obvious, but there exists shortcomings in this approach. Let there be a little-known movie with just a few votes but of a high score. Consider an extreme example of just one vote of score 10. The average being 10, the movie would be on the top of the list which is quite undeserving considering the fact that very few people have seen it and thus voted for it.

Layman’s approach-2:

Let us now refine the above approach in an attempt to cover the shortcomings of the previous approach. We modify it by stipulating that a minimum number of votes, say ‘m’ should be cast for movie before it becomes eligible to be considered for such a listing. Among the movies that meet the cut-off, a simple sorting is done in descending order according to the average rating as before. However, this approach is also far from perfect. Let us consider two movies  $M_1$  and  $M_2$  each with an average rating of 8.5 in a scale of 10, but having a widely different number of votes, say 40,000 and 6,00,000 respectively. If the stipulated minimum number of votes, ‘m’ is less than 40,000 (say 30,000) then both these movies will be ranked equal under this approach. Intuitively, though, we know that there is a significant difference in number of user votes. The rating of  $M_2$  having been voted by a much larger number of users is

more reliable than that of  $M_1$ . Thus  $M_2$ ’s rating is more credible than that of  $M_1$ .

This notion of credibility is made more precise, robust and rigorous by IMDb in its approach. IMDb’s approach is more statistically robust in the sense that its calculations of ratings not just depend on ‘R’ and ‘m’, but also on ‘v’ (the number of votes received for a movie).

Thus we see significant difference in weighted rating of  $M_1$  and  $M_2$  according to the approach adopted by IMDb. The calculations to justify it are as follows:

**Weighted rating of  $M_1$  (according to IMDb):**

Here:  $v= 40,000$ ,  $m=30,000$ ,  $R =8.5$ ,  $C = 7.0$

$$\begin{aligned} \text{Therefore, } \bar{WR} &= \left( \frac{40000}{40000+30000} \right) * 8.5 + \\ &\left( \frac{30000}{40000+30000} \right) * 7.0 \\ &= 4.857 + 3 \\ &= 7.857 \end{aligned}$$

**Weighted rating of  $M_2$  (according to IMDb):**

Here:  $v= 6,00,000$ ,  $m=30,000$ ,  $R =8.5$ ,  $C = 7.0$

$$\begin{aligned} \text{Therefore, } &= *8.5+ ()*7.0 \\ &= 8.095+ 0.333 \\ &= 8.428 \end{aligned}$$

This matches with our intuition that rating of  $M_2$  is more credible and closer to the average rating 8.5 than that of  $M_1$  as it received significantly larger number of user votes. Thus we find that IMDb’s

approach is not only statistically robust and rigorous but also intuitively sound and matches with general perception.

### Scope for further research

Based on the facts and findings, it is suggested that future studies may focus on incorporating manipulative voting (treating votes from different users differently) and using trimmed means of truncated data to reduce effect of outliers. Also in line with loaded credibility premium, studies can be taken up to include loaded user's votes where votes of regular viewers were given more weightage to present a more realistic and accurate rating list.

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# Board Composition, Board Gender Diversity and Firm Performance: Evidence from India

**Saroj Kumar Routray**

Asst. Professor, KIIT School of Management, KIIT University, Bhubaneswar  
saroj@ksom.ac.in

**Ranjan Kumar Bal,**

Professor, Dept. of Commerce, Utkal University, Bhubaneswar

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## ABSTRACT

*Corporate governance is the burning topic of discussion all around the world amid the corporate frauds happened in the last two decades. For better corporate governance in firms, the board of directors collectively play a major role. Board composition matters a lot in the governance of the company because independent directors will not have any incentive to adhere to all the proposals of the management. Again worldwide it is also seen for the last couple of years, that board is increasingly represented by women directors. So the study has been made in that direction to find out the possible effect of board composition and gender diversity on the firm performance. Another dimension has also been studied here in this paper is to see the effect of the above two variables on firm performance in the presence of CEO duality (when CEO becomes the Chairman of the board) and in the absence of CEO duality. The study has been done taking NSE 200 companies, which represent 86% of total market capitalisation of NSE. After excluding the banking and financial companies and few companies for incomplete date the final data set is of 141 companies. A positive association has been observed in relation to firm performance.*

**Key words:** *Corporate governance, Board composition, Board gender diversity, CEO duality*

## 1. Introduction

In spite of important development in the field of corporate governance reforms, there are many examples of corporate delinquencies and unethical conduct, even in countries like USA, long considered a bastion of best practices in corporate governance. Corporate misconduct and accounting frauds done by companies like Worldcom.com, Enron, etc damaged the

fiduciary relationship between the corporate management and investors. To reduce the recurrence of such frauds, US came with the Sarbanes-Oxley Act of 2002, a new act to deal with the emerging situation and provide a strict guideline for corporate to follow in governance, at the same time there is regular interventions by the Securities and Exchange

Commission (SEC) of US. Worldwide, there was a need felt to have better corporate governance measures and regulations to protect the interest of the investors and stakeholders, so that the current format of corporation based on capital market should not get damaged.

In India the reform in the field of corporate governance started with establishment of Securities and Exchange of Board of India (SEBI) in 1992, to protect the interest of investors in securities and to promote the development of securities market. Since then, SEBI has gone a long way by taking measures to establish the faith of investors and specially by introducing Clause 49 of listing agreement for submission of quarterly reports by the corporate to bring more transparency in the system. From time to time different committees are made in India to strengthen corporate governance structure, many of the recommendations are voluntary in nature and some need mandatory compliance. In 1998, The Confederation of Indian Industry brought out its 'Desirable Corporate Governance-A Code'. It was a welcome step towards governance measure on a voluntary basis.

Then in year 2000, SEBI formed a committee under the chairmanship of Kumar Mangalam Birla, which made far-reaching recommendations in governance arena. Since then various committees are formed by either the government or SEBI ( i.e., Naresh Chandra Committee, Narayan Swamy Committee, etc) and their

recommendations are accepted and now followed by the companies. India has also passed the New Companies Act, 2013 which also stipulates the provisions relating to corporate governance, in harmony with global practices.

The need to further strengthen the corporate governance regulation was felt, when India came across the biggest accounting fraud of Satyam (once considered as the best practicing corporate governance firm). This brought out the failure of our corporate governance structure, which centres around the independent directors, who are supposed to oversight the function of the board and bring more effectiveness in the governance. It is not possible in the part of the individual independent director to bring good governance, instead it should be a collective effort.

If governance is to be seen in this perspective, then board composition may play a measure role in improving the governance of company. Different committees have also given lot of emphasis on board independence and board composition. If, collectively board takes decisions, where independent directors play a major role, it will lead to good governance and in the long run the firm will perform better in comparison to firms having poor governance record.

In this study, it has been tried to find out the impact of board composition on firm performance. The composition of board of directors remains a focus

whenever the effectiveness of board is tried to be studied (Fama and Jensen, 1983). Van der Walt and Ingley (2003) express diversity in the context of governance as the composition of the board and the combination of the different qualities, characteristics and expertise of individual member. In the current study board diversity is taking two major aspects into consideration, board independence and gender diversity in the board.

Board independence in the eyes of organizational theorists is a signalling tool that works to protect the interest of investor community (Peng, 2004; Certo, 2003) and the presence of independent directors increases the effective monitoring of managers (Jensen and Meckling; and Shleifer and Vishny, 1997; Fields and Keys, 2003). Research has also stressed the requirement of having more non-executive directors in the board to protect the interest of stakeholders from the opportunistic behaviour of executive directors (Jensen and Meckling, 1976). The other positive aspect of independent directors in the board is their experience and the important connections they bring to the firm, which can ultimately enhance performance of the firm (Fama and Jensen, 1983).

### **1.1. Board composition**

Board composition can be studied from two perspective, one is the mix of independent and executive directors and the second one is the mix of people in the

board based on diverse attribute (gender, age, ethnic background). This paper specifically investigates the board independence and gender diversity, these two factors of board composition on the firm performance. Board independence is measured on the basis of proportion of independent directors in the board and women diversity is calculated on the basis women directors in the board.

Agency theory says that there is a natural conflict between the interest of management and the shareholders of firm (Fama & Jensen, 1983), therefore adequate monitoring is required to protect the interest of shareholders from management's self-interest. One of the device in the hands of the shareholders to have a board consisting of more number of independent director to have better monitoring and supervision the activities of the management. From agency theory perspective a high proportion of outside directors is considered good for governance. Lot of study has been done on this and have different findings.

Board diversity takes many other characteristics like age, gender, socioeconomic roots and educational and functional background and forms a heterogeneous group, while undoubtedly vulnerable to more prolonged discussions and disagreements, have been observed to produce more balanced and better results. Resource dependence theorists are having the view that diversity might bring divergent and unique opinions that would not come from directors from homogenous

background. In this study, the impact of gender diversity is tried to be observed on the firm performance because it is the most easy distinguished characteristics of diversity and can be easily noticed from the annual report of the firm.

In 2013, taking S&P 1500 firms, EY (Ernst and Youngs) has done a survey and found that only 15% of the board of directors positions are held by women which was a 4% increase from 2006 survey. The study also find that gender diversity is more in the case of larger firms (S&P) rather than smaller firms and since 2010, more and more opening in the board positions have been filled by women. In other part of the world also gender diversity in board is recognized as a major challenge. In 2007, the European average was 8.4%, an increase from 5% in year 2001, gradually increasing. In India Based on 2091 Bombay Stock Exchange listed companies filings, it is found that only 4.9% were women directors. This is more or less the story in other countries, but an interesting fact is that representation of women on board has increased in last few years. Therefore, a study of their influence on firm performance becomes relevant in that context.

The impact of board composition gets diluted when the Chief Executive becomes the board chair. Most of the governance failure (Enron, WorldCom and HIH) has been observed in companies where the CEO, was at dual role, therefore all most all committees on governance reforms have

given lot of stress on separating the position of CEO and board chairman. CEO duality increases the agency cost (Jensen, 1993), the board could not able to address the poor performance of the firm (Goyal and Park, 2002) and also, board find it difficult to replace the poor performing CEO. In this study, CEO duality is taken as a moderating variable, and the impact of board composition and board diversity on firm performance is observed. There is no such credible study has been done to see the impact of CEO duality as a moderating variable.

## **2. Literature Review and Hypothesis formation**

### **2.1. Board Composition (Independence of board)**

Agency theory says that outside (independent) directors are in a better position to monitor management because of their assumed independence from the company's managers (Fama and Jensen, 1983), and their expertise developed from prior experience (Mace, 1986). They will follow higher impartiality while evaluating the decision of the management (Baysinger and Hoskisson, 1990). Outside directors arrives at more objective solutions, as there career is not affected (salary, promotion and performance appraisals, etc) due to their decision unlike insiders (Rechner and Dalton, 1991). In many instances they act as arbitrators in resolving the disagreements among internal managers. It is found from various studies

that having more outside directors on the board improves the firm performance (Fama & Jensen, 1983; Daily and Dalton, 1994; Bijalwan and Madan, 2013), while other studies did not find a correlation between independent Non-Executive Directors and improved firm performance (Hermalin and Weisbach, 1991; Kota and Tomar).

In India, as per clause 49 of the listing agreement based on Birla committee recommendation, there should be at least 50% of the board members be independent, if the chairman is a full time executive director. So it is known assumption that board independence leads to effective monitoring of management and brings more transparency to the functioning of the board. In the absence any confirm research result whether outsider directors add value to a firm or not, the following hypothesis is taken:

H1: There is no relation between board composition (independence) and firm performance.

## **2.2. Board Gender diversity**

New insights and perspectives are given in diverse board and that increases the firm performance (Siciliano, 1996).; thus Keeping with these arguments, While several researchers have found that gender diversity of the board bolsters firm's returns, other have found no such impact (Dimovski and Brooks, 2006; Carter, et al., 2010) and still others have found negative relationships (Shrader and Blackburn, 1997). As such, evidence as

to the notion that board diversity is associated with better firm performance is still inconclusive (Adams and Ferreira, 2009).

McInerney-Lacombe et al., 2008, in their study found that group dynamics of communication, interpersonal interaction changes due to the presence of women on boards leading to more creative and innovative decisions and results in better performance of firms. Study says that women are less tolerant than men towards opportunistic behaviour (Srinidhi, et al, 2011) and exhibit greater diligence in monitoring the management and maintaining transparency in reporting. Normally, women are considered as more empathetic, caring and having concerns for others and shows interest in creating values in relationships of great importance to community (Dobbins, 1985; Boulouta, 2013), thus women can create long lasting relationship between firms and stakeholders.

It suggests that the presence of female directors in boardrooms helps firms maximize access to critical resources through their skills, competencies and knowledge, which are different from those of male directors (Hillman, et al., 2007). The above views suggest that diverse boards monitors the management more effectively as a result the firm performance will increase (Smith et al., 2006). (Gul et al. 2011) document that board gender diversity improves stock price information through the mechanism of increased public disclosure in large firms and by

incorporating private information in small firms.

In contrast, Lau and Murnighan (1998) says that with women on board, the board will have more diverse opinion and critical thinking leading to delay in decision making and the board will become less effective. Women directors will raise more questions than the other directors and might be more active and tougher monitors than usually required (Adams and Ferreira, 2009). Among other things, they find evidence that boards with women directors are more likely to remove chief executive officers (CEOs) after poor stock performance and compensate directors with higher levels of equity-based compensation. In their study, Adams and Ferreira (2009) also observed a negative correlation between the percentage of female directors on the board and Tobin's Q. Greater gender diversity leads to more differing opinions and critical questions can be time consuming which hold back the firm, which affect the performance of the badly, especially if the firm is competing in a turbulent business environment (Smith et al., 2006). We get a mixed empirical evidence in relation to women on board and firm performance.

Resource dependence theory regards corporate boards as an essential link between the company and its environment and the external resources on which a company depends. This link is necessary for good performance, as the firm gets benefit from the stakeholders (Pfeffer and

Salancik, 1978). From having female directors, companies get better connected with the stakeholders, including current and prospective employees (Hillman et al. 2007). As there is no confirm established relationship between the variances, hence the hypothesis is formed as follows:

H2: There is no relationship between Gender diversity and firm performance.

### 2.3. CEO duality

The proponent of agency theory say that separating the CEO and Board chair ensures a balance of power and no one has unfettered authority of decision making. The CEO is responsible for the initiation and implementation of plans and policies; the board chairman is responsible to see that board of directors monitor and guide the CEO. By combining the roles of CEO and chairman, one person is having so much power that the board becomes ineffective in monitoring opportunism, which leads to scandals and corruption. But there are contrasting views also regarding the duality. Stewardship theory suggests that CEO duality gives unity of command, it avoids the role ambiguity (Anderson and Anthony, 1986), which fastens the process of decision making. Researchers have found that in certain circumstances, CEO duality results in better performance where as in other cases CEO duality (Boyd, 1995; Lam and Lee, 2008). Contingency theorists seek to identify factors within a firm and its environment that are positively or negatively related to CEO duality (Boyd,

1995). The current study is one, in that direction to identify the effect of factors like board composition and board diversity on firm performance with or without CEO duality.

Hypothesis 3: The proportion of independent director does not have any association with firm performance in a firm without CEO duality

Hypothesis 4: Gender diversity does not have any association with firm performance in a firm without CEO duality

### **3. Data and Methodology**

This paper uses the Nifty 200 companies, ranked on the basis of National Stock Exchange(NSE) market capitalisation and includes high and mid capitalised companies, as the beginning dataset. As per the estimation on March 31, 2016, Nifty 200 includes around 86% of the free float market capitalisation on NSE. Hence, this dataset reasonably covers the population of interest i.e., Indian public corporations.

The data has been collected primarily from two sources i.e., CMIE data base and Company Annual reports. The Accounting and Market related data has been collected mostly from CMIE database, where as most of the governance data has been collected from the Annual reports of the companies.

Banks assets includes the loans which is consisting of depositor's fund , therefore the banks were excluded by Kiel and Nicholson(2003) from the sample size

for their analysis. In this study also the banks are excluded from the sample size because of mainly two reasons, first one is the above reason and the second one is, banks are governed by the RBI guidelines hence little scope remains for the board to decide the governance structure. Also, because of lack of comparable data in some financial institutions and missing data in some other firms, the size of the sample has been reduced further. The final list of 162 companies are obtained as the sample for the study.

The board composition has been measured in this study based on two dimensions, independent directors in the board and gender diversity of the board. The annual report of the companies, clearly discloses the independent directors as well as the women directors in the board. The board composition and financial data has been assessed at one point of time i.e., 31st March, 2014 as disclosed in the annual report and CMIE database.

The firm performance has been majorly assessed by various researchers taking Tobin's Q, return on Assets(ROA), Return on equity(RoE). Here in this study, the firm performance has been measured through two variables, accounting profit and market value and book value of equity ratio(a replacement of Tobin's Q). Accounting profit is considered as ROA i.e, EBIT/Total Asset and the following model is used to observe the association at two different conditions of CEO duality and No CEO duality.

$$ROA = \hat{\alpha}_1 + \hat{\alpha}_2 \text{BdGenDiv} + \hat{\alpha}_3 \text{BdComp} + \hat{\alpha}_4 \text{BdSize} + \hat{\alpha}_5 \text{LnSize} + \hat{\alpha}_6 \text{LnAge} + \hat{\alpha}_7 \text{Lev} +$$

The second model used for the purpose of regression is to observe the impact of Board composition and Board Gender diversity on market value and book value ratio. This ratio represents the capital market performance of firms, again for both the conditions.

$$MVBV = \hat{\alpha}_1 + \hat{\alpha}_2 \text{BdGenDiv} + \hat{\alpha}_3 \text{BdComp} + \hat{\alpha}_4 \text{BdSize} + \hat{\alpha}_5 \text{LnSize} + \hat{\alpha}_6 \text{LnAge} + \hat{\alpha}_7 \text{Lev} +$$

Firm age, firm size, leverage and board size are taken as control variables in the model to remove the endogeneity problem and to account for potential advantages of large scale economies, market power and financial risk features of firm. Many prior studies (Hermalin and Weisback, 1991; Boone et al., 2007) have taken these variables in the model and found that they are correlated with firm performance.

The analysis of results begins with the presentation of summary of descriptive statistics of variables in Table II. Out of the total sample size of 141 firms, it is found that 43 firms are having CEO duality, whereas majority of the firms are having separation in the chairmanship and CEO positions. Statistics show that the average of performance variances (ROA and MVBV) are more in the case of firms with No CEO duality. The average of ROA (MVBV) is 10.99 (5.98) in case of No CEO duality firms in comparison to

9.82 (3.34) in case of firms with CEO duality, but the standard deviation is very high in the case of No CEO duality firms, which says that there are some firms with very high firm performance. But the average board size (11.86) is more in case of CEO duality firms, than the firms with No CEO duality (i.e., 10.8) and proportion of independent director (BoardComp) is around almost same in both the cases. Average lady director is less than 1 in the total sample size, but in companies with CEO duality the average lady director is 0.744, where as in the case of the other companies is 0.684. Based on this statistics it can reasonably be said that in case of CEO duality to justify the board independence and board strength in decision making they have kept more number of board members and independent director, although difficult to prove the board independence from the powerful CEO and Board chair.

$$MVBV = \hat{\alpha}_1 + \hat{\alpha}_2 \text{BdGenDiv} + \hat{\alpha}_3 \text{BdComp} + \hat{\alpha}_4 \text{BdSize} + \hat{\alpha}_5 \text{LnSize} + \hat{\alpha}_6 \text{LnAge} + \hat{\alpha}_7 \text{Lev} +$$

### Correlation Analysis

A positive correlation is there between MVBV and ROA and significant at 0.001 level, which is obvious because of the relationship between both the performance variable. Board composition is showing a negative relation with both the performance variable but correlation statistics shows the non significance of the variable. The board diversity is also not very significant as per the correlation table,

**Annexure:**

Type of variable	Variable	Definition and measurement
Dependent Variables:		
Dependent: Performance	ROA	Return on Asset
Dependent: Performance	MVBV	Market value to Book value ratio
Independent Variable:		
Independent: predictor	BdGenDiv	Women director on board
Independent: predictor	BdComp	Proportion of Independent directors on board
Independent: control	BdSize	Number of directors in the board
Independent: control	LnSize	Firm size, measured as the natural logarithms of the firms total asset
Independent: control	LnAge	Firm age, measured as the natural logarithm of the number of years since the establishment of a firm
Independent: control	Lev	Total borrowings/Total Assets
Moderating Variable	CEOduality	A dummy variable: 0, if the CEO is also the chairman of the board, 1 otherwise.

**4. Results and discussions**

Variables	CEO Duality			No CEO Duality		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
ROA	9.8191	9.69497	43	10.9912	15.43493	98
MVBV	3.3435	2.727	43	5.9864	7.027	
BdGenDiv	.744	.7896	43	.684	.8446	98
BdComp	.5302	.12705	43	.5107	.09255	98
Bdsize	11.86	3.219	43	10.08	2.444	98
lev	.1799	.17720	43	.1623	.17641	98
LnSize	12.0088	1.57365	43	11.3329	1.20231	98
Lnage	3.5566	.50386	43	3.6011	.64909	98

	MVBV	ROA	BoardComp	BdGenDiv	Bsize	CEOdual	LnSize	LnAge
MVBV	1.000							
ROA	.321***	1.000						
BoardComp	-.019	-.020	1.000					
BdGenDiv	.082	.120	.080	1.000				
Bdsize	-.097	-.092	-.096	.311***	1.000			
CEOdual	.198**	.039	-.086	-.034	-.292***	1.000		
LnSize	-.357***	-.258**	-.015	.106	.403***	-.230**	1.000	
LnAge	.114	-.001	-.090	-.047	.079	.034	.034	1.000

\*\*\*Correlation is significant at the 0.001 level(2-tailed)

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

\*Correlation is significant at the 0.05 level(2 tailed)

Table IV	Regression of 141 companies					
	ROA			Market value/Book value		
	Unstandardized Coefficients Beta	Std. Error	t Value	Unstandardized Coefficients Beta	Std. Error	t Value
Board Diversity						
Board Independence	-2.199	10.458	-0.21	0.607	4.61	0.131
CEO duality	-0.638	2.454	-0.26	1.804	1.082	1.667
Board Size	-0.336	0.451	-0.746	0.061	0.198	0.308**
Firm Leverage	-30.955	6.531	-4.739	-9.002	2.879	3.126**
Natural log of Total Asset	-1.159	0.922	-1.257	-1.185	0.406	-2.915*
Natural log of Age of the firm	-0.515	1.779	-0.289	0.99	0.784	1.262
R Square	0.22				0.23	
Adjusted R Square	0.18				0.19	
F statistics	5.48***				5.69***	

\* significant at 0.1 level

\*\* significant at 0.05 level

\*\*\* significant at 0.01 level

Table V	Results of Regression(Dependent Variable: Return on Asset)						
	CEO duality				No CEO duality		
	Unstandardized Coefficients Beta	Std. Error	t value	VIF	Unstandardized Coefficients	Std. Error	t value
Board Diversity	3.995	1.531	2.610*	1.08	1.502	1.878	0.799
Board Independence	5.483	10.17	0.539	1.24	-3.278	16.33	-0.201
Board Size	-0.702	0.44	-1.596	1.48	-0.152	0.663	-0.23
Firm Leverage	-33.03	7.47	4.41**	1.3	-30.43	9.002	-3.381
Natural log of Total Asset	0.175	0.987	0.177	1.79	-1.784	1.389	-1.284
Natural log of Age of the firm	-0.763	2.565	-0.297	1.24	-0.688	2.25	-0.304
R Square				0.484			0.191
Adjusted R Square				0.398			0.138
F statistics				5.633***			3.580***

\*\*\* At 0.01 significance level

Table VI	Results of Regression(Dependent Variable: Market Value/ Book Value)					
	CEO duality			No CEO duality		
	Unstandardized Coefficients Beta	Std. Error	t Value	Unstandardized Coefficients Beta	Std. Error	t statistic
Board Diversity	.734	4.174	1.681	.614	.847	.725
Board Independence	4.468	.436	1.541	.377	7.364	.051
Board Size	-.208	2.899	-1.657	.200	.299	.669
Firm Leverage	-6.194	.125	-2.908**	-10.500	4.058	-2.587**
Natural log of Total Asset	-.330	2.130	-1.175	-1.541	.626	-2.460**
Natural log of Age of the firm	.686	.281	.937	1.094	1.018	1.075
R Square		0.470		0.207		
Adjusted R Square		0.382		0.154		
F statistics		5.328**		3.950**		

\*\*significant at 0.01 level

but otherwise it shows a small positive relationship with ROA and MVBV. Board size is having a positive relationship with board diversity with statistical significance, which shows that increased board size encourages more women on board. CEO duality is positively associated with MVBV and is a significant variable but not significant in relation to ROA, although having a positive relationship with it also. It is also found that natural log of total asset is having a negative relationship with firm performance at 0.001 significance level. The collinearity problem is not there because the correlations are less than 0.70.

Table IV shows the regression table of all 141 companies. Here, it is found that Board composition and board diversity both variables are statistically significant to have any effect of firm performance (both ROA and MVBV). Therefore it becomes more important to study by splitting the firms into two groups i.e., CEO duality and No CEO duality. The F statistics show that the model is significant with Adjusted  $R^2$  of 18(19) for accounting performance and Market performance. Firm leverage and board size is having negative association with the firm performance at 0.01 significance level. It is required to study in longer perspective taking data for few years to confirm the result, specifically for assets.

Table V states that the model is significant at 0.01 level for both the conditions i.e., CEO duality and No CEO duality. VIF less than 3 says that there is no multicollinearity among the independent

variables. It reports the effect of independent variables on Return on Asset (ROA) at the conditions of CEO duality and No CEO duality. It is observed that Board independence is having a positive coefficient when there is CEO duality, but a negative coefficient in case of No CEO duality, although but statistically not significant. Board diversity is positively associated with firm ROA, in case of CEO duality at 0.05 significant level but without CEO duality board diversity is not a significant variable. Firm leverage is negatively associated with firm accounting performance again in the case of CEO duality but not in the case of with No CEO duality and also significant at 0.01 level.

Table VI shows the association of independent variable with that of firm market performance (MVBV). The model is found to be significant at 0.01 level. But both Board diversity and board composition are not significant variable in determining firm performance. It confirms to the finding given by Dimovski and Brooks, 2006; Carter, et al., 2010, that there is not significant association has been found between gender diversity and firm performance. Similarly board composition is not found to have any association with MVBV, confirms to the finding of Hermalin and Weisbach, 1991; Kota and Tomar, where they observed that there is no statistically significant correlation between the firm performance and board independence. At 0.01 significance level, firm leverage is negatively associated with

firm market performance that shows that increasing debt in the capital structure will negatively impact the firm performance, but it is only 2014 data, so more no. of years are to be taken to confirm the result.

## 5. Conclusion

This study examines whether the board composition consisting of board independence and board diversity influence the firm performance. NSE 200 data year 2014 has been used for this study. The banking and financial service companies data has been excluded from the sample size. The second part of the study was to see the impact of board independence termed as board composition in the study and gender diversity on firm performance in the presence of CEO duality and absence of CEO duality. The whole data has been splitted into two groups, one with CEO duality and the other with No CEO duality. Firm performance variable measured through one accounting performance i.e., Return on Asset (ROA) and Market performance i.e., Market value to Book value(MVBV) ratio. In addition, a number of control variables(e.g. firm size, board size, age of the firm and leverage) are also added in the prescribed model.

The study found that with CEO duality, the board gender diversity is positively associated with firm's accounting performance, whereas in case of No CEO duality it becomes a significant variable. Board composition(board independence) is a insignificant variable in case of

accounting performance. when firm performance is measured through market value, both the variables are found to be statistically insignificant. Taking the whole data(without splitting into groups), it is found that board size is positively associated with Market value and Book value ratio and statistically significant.

The limitation of this research is the data, which is consisting of only year 2014. Taking a period more than 1 year will have better consistency in result. Banking and financial companies data has not been considered in this study. Only two governance components are studied. The research can be extended by taking other governance factors into the model.

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## **Diffusion of Technological Innovation in Business: A Study on New Generation Business in India in E-Business Environment**

**Soumendra Kumar Patra**

Sr. Assistant Professor (QT & Decision Science),  
School of Management Studies, Ravenshaw University,  
Cuttack -7530031, Odisha, soumendra.patra@gmail.com,

**Durga Madhab Mahapatra**

Lecturer and Head in Department of Commerce  
MPC Autonomous College, Mayurbhanj, Odisha  
durgagreaternoida@gmail.com

**Rabinarayan Patnaik**

Associate Professor (Marketing)  
Institute of Management & Information Science (IMIS), Swagat Vihar, Bankuala,  
Bhubaneswar-751002, Odisha, patnaik.rabinarayan@gmail.com,

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### **ABSTRACT**

*E-commerce is expanding steadily in the country. Customers have the ever increasing choice of products at the lowest rates. E-commerce is probably creating the biggest revolution in the retail industry, and this trend would continue in the years to come. Various business process owners including retailers should leverage the digital retail channels. Customers in the Indian market place have started adopting the new ways of getting their requirements fulfilled and in the process there is a pool of technology savvy customers have stated emerging out. These changes are fuelled by various agencies of Government of India and made popular by multiple stake holders like online firms, banks, investors and customers at large. The pace at which the preference towards online transactions in India is growing it has become essential to understand the technological factors influencing this recent form of getting connected to the market place. Digital India lies the development of the digital ecosystem in terms of apps and app-based government services as well as free and equal access to all these for consumers across the country. The Research paper discusses the opportunities and roadblocks of new generation business in India.*

**Keywords:** Digital, E-commerce, New generation, Opportunities, Identification and Mobile apps

## **Introduction**

Over last couple of decades, there has been a tremendous change occurring in the information technology sector of India. Most importantly, India is almost on the path of becoming the fastest growing e-commerce market of the world if continuing at the same pace. This growth has been fuelled by huge investment in the sector and the increase of internet users in the country. In a span of 7 years from 2007 to 2014, the internet users in the country have increased from 50 million to 300 million. In the year 2014, the shipments of smart phones to India have been doubled to 80 million. The Indian internet market size is going to touch \$137 billion by 2020, the market capitalization of which is expected to be \$ 160-200 billion<sup>1</sup>. As per sources, the e-commerce market is dominated by Flipkart with a GMV (Gross Merchandise Value) of 45% while Snapdeal is on second place with 26%. The Amazon India is at third position with GMV of 12%. Today, companies connect with their customers and partners through mobile web applications. Companies are now able to track conversations with and between customers on Facebook, Twitter, LinkedIn, YouTube, P interest and more. According to IAMAI (Internet And Mobile Association of India), it has reported that India's online advertising market is set to touch Rs. 2938 crore in 2013–2014 such as search, display, mobile, e-mail and video advertising as well as social media advertising. The mobile live stream launches like NexG TV,

Ditto TV (launched by Zee), and Zenga TV is another player that has been seeing ad revenues. The mobile wallet companies like Airtel money, ITZ cash, Oxicach and GI Tech have built a base of more than 3.5 million customers. The prospects of selling products and services to this digital population create real excitement both among the analysts as well as researchers.

## **LITERATURE REVIEW**

In line with the development of the Internet, E-business is currently an important requirement in the global business world. E-business has offered a variety of potential benefits for both SMEs and large enterprises.

According to Scarborough and Zimmerer, although the web-based sales strategy does not guarantee success, companies with online presence have realized many benefits such as: opportunity to increase revenues, the ability to expand its reach into global markets, ability to remain open 24 hours a day and seven days a week, capacity to use interactive web to improve customer service, ability to lower the cost of doing business, capacity to improve the efficiency of the purchasing process, etc (Scarborough & Zimmerer, 2006). According Engsbo and Scupola, most SMEs adopt e-commerce by chance, not as a consequence of the systematic consideration and planning (Scupola, 2002; Engsboet al., 2001). Meanwhile, according Kartiwi and MacGregor companies do not adopt e-business at the same speed as larger

companies because of various obstacles associated with the adoption of the unique characteristics of companies (Kartiwi & MacGregor, 2007). A study on the implementation of e-commerce/ e-business by companies found that many companies in developing countries are slower to adopt e-commerce than in developed countries ((Kartiwi & MacGregor, 2007; Intrapairot & Srivihok, 2003). One basic difference is the speed of adoption of this paradigm difference between owner/managers of companies in developed countries and in developing countries, examples of comparative case between Sweden and Indonesia (Kartiwi & MacGregor, 2007). Companies in Sweden are more concerned with technical issues, while companies in Indonesia are more concerned with organizational resistance. In addition to organizational and managerial factors (Chong, 2008; Sarkar, 2009; Rashid & Al-irim, 2001; Chong & Pervan, 2009; Sarlak et al., 2009; Wilson, et al., 2008), other factors are also an obstacle sufficient significant at the e-commerce/e-business adoption in companies is the infrastructure and technical factors (Kapurubandara & Lawson, 2008; Sarkar, 2009), environmental factors (Kurnia et al., 2009; Sarkar, 2009; Rashid & Al-Qirim, 2001; Kurnia, 2008), innovation and technological factors (Rashid & Al-Qirim, 2001; Kurnia, 2008). Based on the theory of innovation diffusion (Diffusion of Innovation - DOI) Rogers, the adoption of technological innovation is divided into

3 phases, namely initiation, adoption decision and implementation (Rogers, 1995). In this stage of the adoption process is often discovered constraints faced by companies are in transition moving to e-commerce (Tucker & Lafferty, 2004; Matlay & Addis, 2003; Mendo & Fitzgerald, 2005). As already mentioned above that although e-commerce can provide many benefits for companies. While referring the previous researches gap is incorporated with the following objectives to complete the study.

### **OBJECTIVES OF THE STUDY**

The present study has been undertaken with the following objectives:

1. To understand e-commerce as a significant factor in the emerging scenario of Indian business.
2. To study the import factors influencing e-business environment

### **RESEARCH METHODOLOGY**

In order to substantiate the objectives of the present study, an exploratory research supported with quantitative analysis was undertaken. The findings and inferences are supplemented with the current trend in the business environment to signify the prospects and outcomes.

#### **Sampling**

With a view to examine empirically, an opinion survey was conducted among different respondents with a structured questionnaire. The opinion survey covered 143 respondents selected on the basis of a simple random sampling method.

### Data collection

The present study is primarily an exploratory type. The data have been collected from both primary and secondary sources. The secondary data were collected from different secondary published reports followed by the collection of primary data through structured questionnaires and individual interviews. The respondents were requested to fill in a structured questionnaire.

### Data Analysis

In order to analyse the data, descriptive analysis, such as mean, percentage, standard deviations and reliability coefficients, and inferential analysis, such as Regression analysis, have been used. All the variables were tested for outlier, missing data and normality.

### Sample profile

The primary data is obtained through a well framed questionnaire circulated among the different respondents. In particular the study ascertains the age, marital status, qualification and income of the respondents.

As shown in **Table – I**, most of the respondents are male 109 (76.2 per cent) and female was very few in no. i.e. 34 (23.8 per cent). In marital status of the respondents, maximum of the respondents are married 67.13 per cent (96 no) and 32.87 per cent are unmarried. Similarly in age category of the respondents, maximum of i.e. 52.4 % of respondents are in the

age group of 46 - 55 years and followed by 22.4 % in the age group 36- 45 years. It is also found 14.0% and 9.1% of the employees found to lie in the age group 56-60 and 26-35, respectively. Further, in qualification level maximum of the respondents are graduates 51.85 per cent, then coming post graduate which constitute around 37.05 per cent and undergraduate are very low in percentage i.e. 11.19 per cent only. In annual income maximum of the respondents are having less than INR 6 lakhs of income (51.05 percent) and less having INR 7 to 15 lakhs of income.

**Table-I:** Demographic Profile of the Respondents (N = 143)

Category		Frequency	Percent
Sex	Male	109	76.20
	Female	34	23.80
	<b>Total</b>	<b>143</b>	<b>100.00</b>
Marital Status	Married	96	67.13
	Unmarried	47	32.87
	<b>Total</b>	<b>143</b>	<b>100.00</b>
Age	18–25 yrs	3	2.10
	26–35 yrs	13	9.10
	36–45 yrs	32	22.40
	46-55 yrs	75	52.40
	56 - 60 yrs	20	14.00
	<b>Total</b>	<b>143</b>	<b>100.00</b>
Qualification	Under graduate	16	11.19
	Graduate	74	51.85
	Post graduate	53	37.05
	<b>Total</b>	<b>143</b>	<b>100.00</b>
Annual Income	Upto INR 6 lakhs	73	51.05
	INR 7 - 15 lakhs	23	16.08
	Above INR 15 lakhs	47	32.87
	<b>Total</b>	<b>143</b>	<b>100.00</b>

### Reliability and Validity

As shown in Table - II, it can be inferred that the items used in the questionnaire are internally homogenous

and consistent. At the same time, all items that validated the questionnaire were good. Therefore, all the factors and variables in the questionnaire are significant for the study.

**Table – II** Reliability Statistics (questionnaire)

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	No. of Items
0.870	0.876	8

**Table - III** Reliability Item-Total Statistics (questionnaire)

Sl. No.	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	Understanding Web Terminology	44.44	19.107	0.467	0.865
2	Technology legislation	44.85	19.915	0.32	0.875
3	Internet/broadband – consumer & business markets	44.18	19.277	0.618	0.857
4	Technology infrastructure in a country (Web/Broadband/Mobile)	44.37	19.941	0.283	0.878
5	Technologies offer consumers and businesses more innovative products and services such as Internet banking, new generation mobile telephones...	43.93	18.158	0.776	0.847
6	Secure Systems: encryptions, digital certificates, SSL (secure sockets layer protocol mechanisms)	43.95	18.604	0.669	0.853
7	Distribution changed by new technologies e.g. books via the Internet, flight tickets, auctions...	43.785	18.455	0.726	0.850
8	Technology offer companies a new way to communicate with consumers e.g. Social media, Customer Relationship Management (e CRM), etc.	43.641	18.251	0.785	0.847

After reviewing the above analysis it can be concluded that the items used in the questionnaire are internally homogenous and consistent. At the same time all the items are good.

**Table - IV** Descriptive Statistics (Variables)

Sl. No.	Items	Mean	Std. Deviation	N
1	Understanding Web Terminology	3.769	0.646	143
2	Technology legislation	3.356	0.643	143
3	Internet/broadband – consumer & business markets	4.028	0.488	143
4	Technology infrastructure in a country (Web/Broadband/Mobile)	3.832	0.691	143
5	Technologies offer consumers and businesses more innovative products and services such as Internet banking, new generation mobile telephones...	4.272	0.558	143
6	Secure Systems: encryptions, digital certificates, SSL (secure sockets layer protocol mechanisms)	4.251	0.562	143
7	Distribution changed by new technologies e.g. books via the Internet, flight tickets, auctions	4.537	0.475	143
8	Technology offer companies a new way to communicate with consumers e.g. Social media, Customer Relationship Management (e CRM), etc.	4.747	0.410	143

**Table – V** Regression coefficients of Job Performance

Sl. No.	Items	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R <sup>2</sup>	F	Sig n.
		B	Std. Error	Beta					
1	Understanding Web Terminology	0.321	0.131	0.241	2.321	0.002*			
2	Technology legislation	-0.601	0.306		-1.963	0.053			
3	Internet/broadband – consumer & business markets	0.235	0.059	0.234	3.965	0.000*			
4	Technology infrastructure in a country (Web/Broadband/Mobile)	0.177	0.073	0.211	2.434	0.017**			
5	Technologies offer consumers and businesses more innovative products and services such as Internet banking, new generation mobile telephones...	0.202	0.078	0.244	2.596	0.011**			
6	Secure Systems: encryptions, digital certificates, SSL (secure sockets layer protocol mechanisms)	0.217	0.043	0.353	5.035	0.000*			
7	Distribution changed by new technologies e.g. books via the Internet, flight tickets, auctions	0.204	0.043	0.271	4.719	0.000*			
8	Technology offer companies a new way to communicate with consumers e.g. Social media, Customer Relationship Management (e CRM), etc.	0.154	0.052	0.195	2.961	0.004*			

\*Significant at 1 per cent level, \*\* significant at 5 per cent level

Table - IV reveals that each factor used in this study is a good dimension. Since the mean value of each item was coming more than 3.0 which signify that all the respondents respond positively to the factors. It has been observed that out of the total 8 different variables the total mean score of the 8<sup>th</sup> variable - Technology offer companies a new way to communicate with consumers e.g. Social media, Customer Relationship Management (e CRM), etc. was coming highest i.e. 4.747, then coming 7<sup>th</sup> - Distribution changed by new technologies e.g. books via the Internet, flight tickets, auctions 4.537 and least is coming Technology infrastructure in a country (Web/Broadband/Mobile). Further, the standard deviations of all the factors are shown in the above table. The standard deviation of the variable i.e. Technology infrastructure in a country (Web/Broadband/Mobile) (0.691), Understanding Web Terminology (0.646) and Technology legislation (0.643) was coming high in comparison with other variables.

Further in Table – V, the R<sup>2</sup> square value is coming to be 0.789 i.e. all the independent variables influenced the dependent variables by 78.9 per cent which is a good sign of the model formulation. The F statistic is 37.364, and its significant value was coming 0.000 so the model is significant. The t value tells us that the predictor, The variables like -

Understanding Web Terminology, Internet/broadband – consumer & business markets, Secure Systems: encryptions, digital certificates, SSL (secure sockets layer protocol mechanisms), Distribution changed by new technologies e.g. books via the Internet, flight tickets, auctions, Technology offer companies a new way to communicate with consumers e.g. Social media, Customer Relationship Management (e CRM), etc. are significant at 1 per cent level and the variables - Technology infrastructure in a country (Web/Broadband/Mobile), Technologies offer consumers and businesses more innovative products and services such as Internet banking, new generation mobile telephones... are significant at 5 percent level. Out of all the variables taken to study technological factors of e-business environment the variable - Technology legislation is not coming significant.

### **EMERGING FACE OF INDIAN BUSINESS ENVIRONMENT**

There is a need for need for retailers to communicate authentic value proposition consistently across digital and physical channels, enhance customers' end to end shopping experience through use of technology, increase two way engagements with customers through digital channels and deliver a seamless shopping experience across channels by focusing increasingly on data analytics, managing rapid changes in business

<sup>13</sup> CII and Deloitte Touche Tohmatsu India LLP Report

<sup>14</sup> Pew Research Center, The Economic Times, Bhubaneswar edition,, 29th February 2016

environment and technologies, and building more agile systems to connect multiple channels, channels and points of sale while providing a unified view of the customer<sup>1</sup>. The emergence of social media (Table-VI)

has made the process really easy and accessible in several countries including India. In India, over 57% of people on Facebook are connected to small businesses.

**Table- VI** <sup>14</sup>Social Media Popularity of Top 10 and top bottom countries

Top 10 Countries			Bottom 10 Countries		
SL	Country	%	SL	Country	%
1	Jordon	90	1	Germany	50
2	Indonesia	89	2	Pakistan	50
3	Phillippines	88	3	Japan	51
4	Venezuela	88	4	South Korea	51
5	Turkey	87	5	France	57
6	Palesti-Ter	86	6	India	52
7	Chile	85	7	China	63
8	Malaysia	85	8	Burkina Faso	65
9	Nigeria	85	9	Italy	65
10	Russia	85	10	Spain	65

Another factor adding to the emergence of E-commerce is the mobile wallets. According to a survey by Nielsen, Indian consumers are adopting the wallet almost as rapidly as their counter parts in more developed countries. Customers

want apps to also help with mobile recharging, booking maite tickets, shopping and such other facilities. Paytm has three in every 10 smart phone users using their app, just one in every 10 users use the company's website.

**Table- VII** Top Mobile Payment Apps in India<sup>15</sup>

SL	Company	Top Mobile Payment Apps (%)	Time Spent by Users (Mins) Month
1	Paytm	39%	70
2	Mobikwik	26%	40
3	Freecharge	17%	29
4	My Airtel	10%	18
5	My Vodafone	7%	17
6	Oxigen Wallet	6%	17
7	Paytm Wallet	5%	14
8	Pockets by ICICI	4%	23

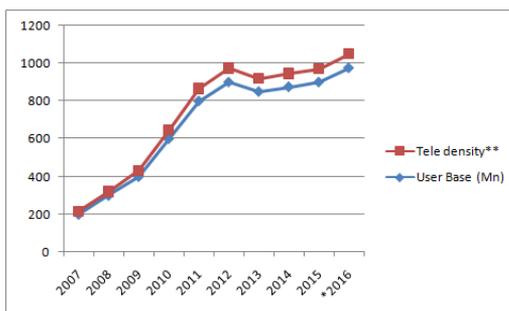
<sup>15</sup>Nielsen Informat Mobile Insights, Dec 2015, Business Standard, Bhubaneswar edition, 29<sup>th</sup> February 2016, p.6

Along with mobile apps e-commerce is expected to grow at more than 30% annually. Reliance industries is extending the Jio brand name to new businesses, the latest of these being a fashion ecommerce site dubbed AJIO Com. The company has named its telecom unit Reliance Jio and is upcoming digital wallet Jio Money. According to the Boston Consulting Group and the Retailers Association of India estimated that the size of India's ecommerce market, including travel and other services, will swell to \$60-70 billion by 2019 from about \$17 billion in 2014. Snapdeal launched seven regional language versions of its app. Quikr is now available in seven Indian languages. Hike Messenger launched Eight Vernacular language and Ola cabs have its driver's app in several regional languages. A steady growth in the telecom subscriber base in India (as per Table - VIII, Figure I) has also been working as a change agent in the Indian business environment.

**Table-VIII** India's Telecom Subscriber base (Mn)

Year	User Base (Mn)	Teledensity**
2007	200	15
2008	300	20
2009	400	30
2010	600	45
2011	800	65
2012	900	75
2013	850	70
2014	875	70
2015	900	70
*2016	975	75

\*Till Nov 2015 \*\* Connections as per 100 individuals



**Figure I:** India's Telecom Subscriber base<sup>16</sup> (Mn)

In addition to all these factors, the banking sector in India has played a vital role in making E-commerce as an emerging business practice and a preferred tool by the customers. Retail payments in India has seen a paradigm shift with card payments are tending positive over the years (as shown in Table- IX)

**Table- IX** Retail Payments in India (Transaction Mix by Volume<sup>17</sup>)

Year	Paper Clearing	Electronic Clearing	Card Payments	Prepaid Payment Instruments
2012	53.0	20.2	25.6	0.00
2013	44.7	23.6	29.4	0.00
2014	34.7	30.6	31.1	0.00
2015	29.9	26.7	35.6	7.9

**Table- X** Top 5 Banks with Mobile Banking Transactions<sup>18</sup> (Figures are for December 2015)

SL	Bank	Mobile Transactions		Market Share	
		Volume (lakhs)	Value (cr)	By Volume	By Value
1	SBI	152	17,636	39	36
2	ICICI	70	10,577	18	22
3	Axis	60	6,268	15	13
4	HDFC	39	8,717	10	18
5	Kotak	17	2,325	4	5

<sup>16</sup> TRAI, TechSci Research), Published in Business Standard, Bhubaneswar edition. 20-21<sup>st</sup> February 2016, p.6

<sup>17</sup> RBI, JM Financial, Business Standard, Personal Finance, Bhubaneswar edition, 14<sup>th</sup> March 2016, p.1

<sup>18</sup> RBI

State Bank of India has its own digital baby in the name of SBI rewards. Axis Bank behind with its Pingpay, ICICI Bank has launched “all new mobile banking app”, HDFC Bank with its launch of Payzapp is almost replicating a Flipkart or Paytm.

With the enthusiasm and the support coming from all directions including customers and government alike, the future of business seems to be mostly in the e-commerce interface. However there are certain challenges this emerging form is expected to overcome. The following paragraphs brief about these prospects and challenges, e-commerce in India is going to have.

### Developments and prospects

- The connectivity is improving because of Government of India’s announcement of Rs 20,000 crore packages to extend variable coverage in India and Digital India’s initiative to cover 2.5 lakh villages with broadband access which improve internet access.
- Online companies like Snapdeal and Craftvilla are in various stages of multiple-local-language rollout. Snapdeal has built a lighter mobile browser “Snap-Lite” to allow users to shop online using slower 2G networks.
- Merchant loyalty and engagement have become key factors in India’s cut-throat e-commerce industry.
- E-commerce majors like Amazon, Paytm and Shopclues are recreating the click-to-buy model for their sellers on business-to-business (B2B) platforms as well.
- Cash backs are an incentive programme where a fixed or a percentage of the amount spent back to the wallet holder’s account. It primarily boosts repurchase at purchases, reduces cash on delivery orders and order returns.
- Many consumers in metro cities have seen their cash transactions go down significantly because of growing e-commerce.
- Paytm has plans to buck the trend and double the salaries of around 200 employees across the company as reward their noteworthy performance.
- Marketers and publishers are using innovative methods to create format and deliver digital advertising. One form is “native advertising” content that bears a similarity to the news, feature articles product reviews, entertainment and other material that surround it online.
- The secular shift in technology, mobility, social computing and analytics have led to changing consumer behavior. Thus, the digital and physical worlds are starting to come together. So the innovation has brought efficiencies creating a better customer experience through best pricing, speed and convenience.
- DIPP (Department of Industrial Policy & Promotion) clarified 100 percent

FDI is only for the market place format of e-commerce, where the company provides a platform to act as a facilitator between buyers and sellers and not for the inventory led model.

- Almost all online stores offer benefits like 100 percent purchase protection, guaranteed one day delivery, easy returns and COD (Cash on Delivery) etc.

### **Issues and challenges**

- Failure of deliveries, pilferage in cash on delivery orders, or theft; logistics remains as one of the biggest headaches.
- E-commerce and mobile-app based service provides such as Amazon, Flipkart, Snapdeal, Paytm and Ola are increasingly roping in ethical hackers to look for loop holes in their system by continuously trying to hack into them from outside.
- Online discounts are mostly limited to select brands such as online-exclusive ones, old merchandise and own levels as ecommerce companies looked to protect margins and turn profitable.
- Amazon plans to offer loans to key vendors selling on its portal in an effort to lock-in sellers from shifting loyalties to rivals Flipkart and Snapdeal.
- Internet as a medium of sale and promotion effectively addresses challenges faced by traditional consumer's brands like maintenance of huge inventories that incur significant storage costs.

- Companies like Flipkart and Amazon, Paytm operates on a zero inventory model. It, however, encourages its sellers to store stocks in third party fulfillment centers to control quality and reduce delivery timelines.
- While E-commerce adoption is growing in the country, there is still a large section of population that is hesitant about making purchases online. The companies are working hard to convey features like easy returns and access to genuine products that essentially build customers trust and confidence in shopping.
- There have been several negative issues which are coming frequently, like the ecommerce giant Amazon has been in a heated battle with the state government over a taxation issue of Karnataka. Also Flipkart is engaged with several stakeholders to urge the Uttarakhand Government to revoke the addition tax on e-commerce.
- Coming to the authenticity test of sellers, Flipkart has blacklisted 250 sellers on its platform after its ongoing-"Mystery Shopping" initiative called "Secret Agent", they were selling poor quality products or defaulting on deliveries or making wrong packaging or price labeling.
- The absence of quality broadband in smaller cities and towns in particular has come in the way of growing the market for online retail.

## CONCLUSION AND FURTHER SCOPE OF STUDY

E-commerce has started influencing the lifestyle of Indian households as well as commercial entities. As realized over past years, the business processes have almost started adopting different platforms by incorporating technology thanks to e-commerce. National Informatics Center (NIC), a Government of India enterprise is primarily looking after the development of information technology in India. NIC was the beginning of an effort to computerize government and digitalize India for the 21st century. Further, NIC has done a remarkable job of building human capacity, institutional frameworks and programmers for e-governance functionalities. Another organization such as C-DOT digitized India's networks and the number of phones has increased from 5 million to 1 billion. Further, the creation of the National Knowledge Network (NKN) is a high bandwidth network to connect all educational institutions in the country to enable high-end research and collaboration. Another internet access for the rural population is the National Optical Fibre Network aimed to provide high speed broadband connectivity to 2, 50,000 Panchayats in the country. With all these developments happening quite often, there is still a requirement of real research work required to understand and address several areas related to this revolutionary process which have got a tremendous potential to influence the business and economy at large.

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## Learning Organizations in Action: Evidence from the Downstream Hydrocarbon Industry in India

Ashok K Sar

School of Management, KIIT University Bhubaneswar, India  
aksar@ksom.ac.in

### ABSTRACT

*The objective of this study is to investigate the dynamics of organization development in the Indian downstream hydrocarbon industry. The qualitative approach adopted, allows author to understand better all the dynamics, challenges and complexities that characterize companies facing change. The author used public information, internet resources, in-house journals and companies' document to gather necessary information. In building a learning organization, organizations go through specific development stages: "(a) knowledge acquisition, (b) knowledge sharing, and (c) knowledge utilization". Six dimensions influence these three stages: (a) culture in organizations, (b) empowerment and leadership, (c) communication dynamics, (d) knowledge transfer, (e) employee quality, and (f) capability upgrading. If other case studies confirm or improve upon the author's suggestions, useful guidelines could arise for companies dealing with change management. This paper shows how three highly bureaucratic companies have built learning organizations to manage change effectively.*

**Key words:** Learning organization; change readiness; hydrocarbon sector; knowledge management.

### Indian Downstream Hydrocarbon Industry

Historically, the industry has been fully regulated by the government through respective bodies with prices set under an administered pricing mechanism (APM), and assured 12% return on net worth post-tax (Dey, 2001). As a part of the ongoing economic reforms, the Indian government was actively pursuing privatization of the public sector organizations. There was a

clear message from the government that all public sector organizations should have a business orientation irrespective of the social obligations. In 1995, Sundararajan Committee Report: 'Hydrocarbon-2010' was published. It suggested dismantling the APM for the Indian oil and gas sector (Kazmi, 2008).

In 1998 APM was partially

dismantled and was expected to be removed by 2002 (Jeyavelu, 2006). The government control on distribution and marketing was also expected to be relaxed by 2002. This also did not happen. Although it did not happen till 2013 for various reasons, the sense of competition has come into the oil marketing scenario in a big way.

The partial deregulation of the Indian downstream hydrocarbon sector thus brought opportunities to win: oil companies could create and capture opportunities in several product market segments and earn returns far more than the assured return under the APM (Personal, Archive, & Bandyopadhyay, 2010). They were no more bound by the cost plus pricing in these product markets and had opportunity to design strategies to get into value added products or services and charge premium.

Mr. U Sunderajan, the CEO of Bharat Petroleum Corporation Limited (BPCL) provided the key drive for organisation change in the industry in the nineties (Bharat Petroleum, 2000). The public sector status and the assured rate of return on investment under the APM kept the industry in a state of inertia. His two trusted lieutenants - directors during the change management process in the late 1990s - became CEO's of the other two oil companies. Mr. M.B. Lall became CEO of Hindustan Petroleum Corporation Limited (HPCL) in 2002 and Mr. S. Behuria became CEO of Indian Oil Corporation Limited (IOCL) in 2004. The

change initiatives in the other two companies reflect the basic philosophy of trying to build organizations characterised as learning.

### **Learning Organization (LO) Concepts**

There have been a number of approaches to define Learning Organization (LO). Senge (1990), popularized the LO concept in his book *The Fifth Discipline*. Senge emphasizes expanding organizational capability through "system thinking, personal mastery, mental models, shared vision and team learning". Garvin (1993) highlights LOs as "having the capability for problem solving, experimentation, learning from past experience, learning from the best practices of others, and quick and efficient transfer of knowledge". Goh (1998) identifies LOs as "possessing certain strategic building blocks, such as shared leadership and involvement, teamwork and cooperation, transfer of knowledge across organizational boundaries and an Emphasis on mission and vision". Bennett and O'Brien (1994) came up with "key factors which have an effect on an organization's ability to learn and change". Watkins and Golembiewski (1995) emphasize that "a learning organization continuously learns and transforms itself". Gephart and Marsick (1996) emphasize "an improvement in the organizations' ability to learn, adapt and change for innovation". "An organization in which Employees are continually acquiring and sharing new knowledge and are willing to

apply that knowledge in making decisions or performing their work is referred to as a learning organization” (Lewis, 2002). “A learning organization is a consciously managed organization with learning as a vital component in its values, visions and goals as well as in its everyday operations and their assessment” (Moilanen, 2005).

### **Sequential stages of developing into LOs and Dimensions**

Based on preceding discussions on the meaning of LOs, such organizations develop capability to learn to manage change thereby create sustainable competitive advantage. Three key stage of development- “a) knowledge acquisition, b) knowledge sharing and c) knowledge utilization” seem to be a feature of such organizations (Crossan, Lane, & White, 1999).

“Knowledge acquisition” refers to the stage in the development of a LO, where learning by members individually as well as cooperatively is reflected- “(a) from past experiences and the best practices of others, (b) from others’ success or failure, (c) from experimentation, and (d) from training and educational activities”. As a result, members in organizations obtain knowledge from continuous learning.

Once members in an organization acquire knowledge, it must benefit the organization in achieving its purpose. The next step in LO development – “knowledge sharing” helps the organization too benefit from the acquired knowledge as the knowledge is then shared with other

employees and other external stakeholders like customers, suppliers, service-providers and complementors. The process of sharing knowledge can start simple with one-to-one sharing and become very complex with many-to-many sharing.

The third step – “knowledge utilization” is the ultimate means to manage change to achieve the purpose of the organization. In this step, internally as well as externally acquired and shared knowledge is managed to benefit from opportunities arising from the external environment as well meet environmental challenges. It also becomes a means to create and capture opportunities through creativity and innovation.

### **Knowledge Acquisition**

The key to acquire knowledge is to appreciate the location of learning activities. These can be at three points, (a) individual level learning, (b) team level learning and (c) organization level learning.

### **Individual level Learning**

All three companies studied, have a strong tradition of formal as well as informal learning activities. Most of the new recruits join the companies at the entry level either in management or non-management category of employees, with on-boarding programs, hence the importance of learning the technical as well as behavioral skills. The strong motivation and incentives are reflected in the link between performance and training and development initiatives. The knowledge

acquisition happens at the formal level through year-long management development programs, short-term skill development programs and the executive development program at leading national institutes. All three companies have had a systematic training and development calendar for all employees. At the informal level learning takes place through planned rotation of work assignments. Cross functional lateral transfers happen on a regular basis considering potential in prospective employees. To summarize, it is clear that the companies encourage knowledge acquisition as an essential characteristic, especially the integrated approaches comprising of formal as well as informal learning activities and review of performance with focus of possible knowledge shortfalls which serves as key feedback to the know acquisition process.

### **Team level learning**

During the last five years there has been significant change in the modes of communication creating greater opportunities to learn in team by; (b) freely-shared information; (c) an atmosphere of trust; and (d) a supportive relationship between members and co-operative planning". During 1997-2003 all three companies have been restructured from a purely functional structure to structures capturing customer based strategic business units. One key highlight of the new structure is the decisions based on teams rather than individual positions. The team learning has been particularly significant at

learning from the experience of being members of multiple teams and from the communication between teams in all three companies. Going a step forward, the team interactions also involve external members such as suppliers, customers and competitors. For example there are common forums like state level committees, the monthly regional sales review forum and the monthly performance review forum associating the government (MOP&NG, 2013).

### **Organizational Level Learning**

The institutional mechanism in place in the companies clearly indicate development of norms driven by strong cultures that have enabled people and teams to share knowledge openly leading to greater levels of effectiveness in a relative dynamic business environment. For example, in BPCL and HPCL, the performance management system is partly based on balanced scorecard, where "learning and growth" perspectives drive most of initiatives at the corporate level, strategic business unit (SBU), team and individual levels (BPCL, 2013). This also a reflection a strong structure, systems and processes base mirroring an appropriate culture forming a strong base to facilitate organizational level learning.

### **Learning Sources**

While the companies under the study have realized the importance of the location of learning, they have also realized the significance of the learning sources,

specifically, interaction with employees, customers or clients, vendors, suppliers and competitors. Some key evidence and practices are explained in the following section.

### **Employees**

Employees have been found to sharpen their analytical as well as creative problem solving capabilities with greater appreciation of interdependency among team members. For instance, at HPCL, a difference in authority and responsibility is built into the system which enables employees to cooperate (HPCL, 2013). Employees as a source of learning, is primarily directed towards individual learning. This individual level learning extends to team learning, when employees are grouped with superordinate goals with a strong motivation for sharing knowledge among members of the group(s). With the appropriate norms in the studied organizations, learning appears to have taken place at the organizational level. From the above arguments, it is evident that Employees constitute an important source of learning at all levels of the organization in three companies.

### **Customers**

Today in a deregulated business environment, meeting customers' expectation has been the key to success. This is reflected in the significance of and importance given to the "customer perspective" in balanced scorecard in BPCL (BPCL, 2014). IOCL and HPCL

use a slightly different variant of this perspective in their business planning. Further some form of Customer Relationship Management (CRM) has been in operation in all the companies capturing various dimensions of service quality. Mystery customer audits are carried out in regular interval to assess the service quality gaps giving vital input for further action. To summarize, there is very clear evidence in the three companies about learning customer needs.

### **Competitors**

Competition is one of the main sources of knowledge acquisition for productivity and innovation. All three companies have been found to be aware of any newly developed activities undertaken by rivals. They learnt from what competitors do to beat them. This reflection process provides an organization with the opportunity to turn its weaknesses into strengths, or through cooperation, turn head-to-head competition into collaboration, thus, rivals are an important source of knowledge acquisition for an organization in building up a competitive advantage. There are a number of formal forums at corporate, regional, SBU/ Divisional/ State level where periodic interaction takes place between the employees of the three companies. For example, for developing a new retail network, the industry coordinator at Mumbai interacts with the state level coordinators (Sector & Companies, 2014). Final annual marketing plans are

developed based on the prevailing volume-distance norms. Similar proposals to develop consumer fuel storage and dispensing facilities for industrial consumers are discussed at the state or SBU levels. The monthly regional review meetings and the monthly performance meetings have also been forums to learn about competitors (PPAC - MOP&NG, 2014).

### **Suppliers and Vendors**

Organizations can learn from their suppliers through collaboration. Suppliers or vendors are able to offer knowledge management seminars or conferences to their clients (Arroyo López, Holmen, & de Boer, 2012). For instance, BPCL develops partnerships with its liquefied petroleum gases (LPG) equipment suppliers by giving them training through the corporate training center and requiring them to upgrade production systems (BPCL, 2014). Similarly IOCL has collaborated with its key vendors in the refinery and pipelines division for quality up gradation and inventory management (IOCL, 2008). HPCL has collaborated with lubricants packages manufacturers on just-in-time inventory management (HPCL, 2014). Over all there are systematic vendor relationships management processes that are automated through the enterprise resource planning (ERP) applications.

### **Continuous Learning**

Continuous learning has been supported with experimentation and

allocation of financial resources. The three companies have demonstrated commitments to promote creativity, thereby have multiple opportunities and avenues to learn. Apart from this, the organizational climates have enabled host of opportunities for employees' self-development and a culture where employees seek knowledge. A strong emphasis is placed on learning and skill development, through either formal or informal learning programs. Beyond this emphasis, the companies have created ideas by going outside their boundaries and learning from what other companies do or by benchmarking for development as well as imitation.

### **Dimensions of learning organization that facilitate knowledge acquisition**

Going beyond the identification of learning locations and sources, learning involves culture in organizations, empowerment and leadership, communication dynamics and employee quality (Awasthy & Gupta, 2012). Some key evidence and practices with respect to the three oil companies studied are explained in the following section.

### **Culture in organizations that facilitate knowledge acquisition**

The multi-divisional structure organized into strategic business units; clear set of decision rights and rules and processes driven by meritocracy in the three companies have mirrored a culture facilitating knowledge acquisition. This culture displays itself in several ways.

The organization structure in BPCL is organic in part. There is extensive delegation of decision making authority (BPCL, 2015). Similarly in many of the new strategic initiatives, IOCL realized that the knowledge base for decision making is specialized and can't be transmitted upward to the top management through the hierarchy. This necessitates vertical and horizontal decentralization. Thus the companies have demonstrated the translation of learning to action with a strong capability to learn.

Alongside decision rights and rules capturing – who has the right to take a particular decision and what the decision rule(s) concerning that decision, there are processes in the form of strong network of personal relationships that accompany the flow of work. The companies have thus demonstrated flexibility and adaptability supported by a climate of openness.

The performance management map in BPCL and HPCL for all management employees captures stretched targets. They realize that this is the key means to trap the latent capabilities in people. However the fear of failure could haunt employees. To overcome the fear of failure and leverage the latent capabilities, the performance management map captures limitations to perform and an action plan thereof. This encourages people with decision rights to take risk and develop a strong willingness to learn from past performance including poor performance.

Learning and development are no more support services, but part of key business processes in BPCL, with clear HR scorecards, drawn from the learning and growth perspective of balanced scorecard. Assessment and development center related activities reflect the importance attached to the learning and development processes. This creates an organization climate that support experimentation and continuous development of competencies.

Gone are the days of keeping knowledge secrete from fellow colleagues. It's the era of super ordinate goals and shared values, more evident in a gap between individual responsibility and authority. This is captured in the performance management maps and annual budgets, thus there are boundary-less organizations within which employees' desire to learn and share knowledge has improved greatly.

The career progressions in all three companies studied are driven by a transparent process. Particularly in BPCL, there is a high weightage for the performance domain and potential domain concerning learning and growth. For instance, if an employee meets the learning and growth related targets, there is a clear reflection in the overall performance and potential score, thus there are rewards for members or teams who continuously learn and share knowledge with others.

### **Empowerment and leadership that facilitate knowledge acquisition**

Leadership empowerment issues have begun taking a peculiar shape in BPCL following the restructuring during 1998 - 2000. A concept of visionary leadership, where the co-created shared vision leads, has come to be the dominant theme. This has been institutionalized across the length and breadth of the organization through the Foundation on Learning (FOL) and Visionary Leadership Program (VLP). The role of employees in top and senior managerial positions has been limited to facilitating the functioning of teams. The new set of governance councils comprising of the board, apex council, executive council, and management council have been the structural evidence of the profile of leadership and empowerment, thus, leaders have been able to play a vital role in process of building LO: “(a) they design organizational policy and strategy; (b) they are role models for employee learning and continuous improvement; (c) they actively encourage and experiment; (d) they encourage leadership skills at all levels; and (e) encourage empowerment in their organization”. A similar reorientation profile has been observed in HPCL after the roll out of the ERP application.

### **Communication Dynamics that facilitates knowledge acquisition**

The realization of the current reality with reference to the importance of knowledge base in decision making in BPCL during the restructuring exercise has given way to a host of informal communication channels and medium. The highlight has been to appreciate the position of the knowledge base and delegate decision rights to that position, sub-entity to ensure timely decision making, while ensuring quality of decision making. Such delegation of decision rights has the potential risk of being misused owing to agency problems. The new channels of communication, primarily automated through the SAP application ensures that there is free, open communication and shared with customers, suppliers, competitors and between other members: communication is fast, clear, and focused; communication has entailed a willingness to share ideas; communication has been conducted in a climate of trust; and a blame-free culture in which members feel free to report errors. In this way, members in BPCL have been learning, sharing and utilizing knowledge over time.

### **Employee quality that facilitate knowledge acquisition**

The oil companies in the study - IOCL, HPCL and BPCL have a rigorous

<sup>19</sup> Indian Institute of Technology

<sup>20</sup> National Institute of Technology

<sup>21</sup> Indian Institute of Management

<sup>22</sup> Xavier Labour Relations Institute

human resource policy which emphasizes planning, recruitment and selection processes to ensure quality input, which fit the organization. As a result they recruit the best candidates from premier technology schools like IITs<sup>1</sup> and NIT<sup>2</sup>s as well as premier business schools like the IIMs<sup>3</sup> and XLRI<sup>4</sup>. As a result the companies have: “(a) the ability to learn; (b) shared leadership and coaching behavior; (c) ability in teamwork, (d) creative workplace problem solving and innovation; (e) develop a strong commitment to generating and transferring new knowledge and technology; (f) develop a commitment to lifelong learning; (g) gain knowledge and understanding of how their jobs are important and contribute to organizational goals; and (h) a strong commitment to the mission and vision of the organization”.

### **Dimensions of learning organization that facilitate knowledge sharing**

In BPCL, leading from the perspective of super- ordinate goals or shared values, the importance of knowledge sharing has been highlighted in the premises to the performance management map (BPCL\_HRI, 2014). It is clear from the associated documents that without knowledge sharing, the knowledge base may not be useful. Further, sharing ensures upgrading and updating the inventory of the knowledge base. The sharing has been operationalized in part by disseminating valuable

information. Employees learn from this dissemination of knowledge within organizations, as well as that transmitted from other entities. The next section discusses how knowledge has been shared in the three companies.

### **Culture in organizations that facilitate knowledge sharing:**

Shared-mindset-which includes shared vision, value, communication and information-has been a key outcome of the restructuring processes in all the three oil companies. Particularly, in BPCL, the entire gamut of activities relating to strategy formulation and management and performance management starts from the co-created shared vision (BPCL\_Vision, 2012). Similarly, in HPCL and IOCL the rolling business plans reflect the shared mindset.

A review of the in-house journals<sup>23</sup> of the three companies reveal of a norm of open communication, which is reflected in sharing of errors, acceptance of conflicts and collaborative efforts to solve problems. With a view to make business transactions transparent, IOCL implemented an integrity pact through a Memorandum of Understanding (MOU) with “Transparency International India (TII)” in January 2008. IOC’s belief in maintaining transparency in dealing with stakeholders is based on its assumptions that in a complex and dynamic multiproduct multi-location environment require a reflection of fairness.

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<sup>23</sup> BPCL INFOLINE, IOCL Publications & HPCL Employee Portal

HPCL initiated a process of organizational development called Project-“Achieving Continuous Excellence (ACE)” (14Ma). It project aimed to transform HPCL from a conventional functional organization to a more customer driven organization. The key means of the transformation was a strong moral culture with a focus on learning and growth. The co-creation of a strategic direction was one of the early outcomes, which paved the way for further development. This has necessitated development of a culture of lifelong learning, and a boundary-less environment. The development thereof has been possible owing to the e-learning portal in place, with interactive e-learning modules on technical, functional and behavioral aspects.

Use of learning and development consistently as a means to win in the market place has been recognized, which is reflected in the “BML Munjal Award for Excellence in Learning and Development” (IOCL\_BMLMA, 2014). The evaluators for the award, had very high appreciation of the general management programs for all levels of management, a deviation from the conventional logic where such programs were primarily for senior and top management. In the acceptance speech, the CEO, reflected his belief that a strong HRD along with a robust business strategy is an important foundation for success (14Ma1). He further mentioned that the associated initiatives would enhance the company image as a portfolio of competencies as opposed to the

conventional logic of seeing the company as a portfolio of businesses. This exemplifies an environment culture in which employees feel confident in sharing knowledge with each other and the culture of teamwork, collaboration and trust.

### **Empowerment and leadership that facilitate knowledge sharing:**

The performance management systems put in place in the balanced scorecard format capture the four perspectives-“financial, customer, internal processes and learning and growth” in BPCL and HPCL. It has facilitated the leaders’ commitment to the achievement of knowledge sharing related objectives. Their actions have shaped organizational structure, decision-making processes and emphasized teamwork.

In BPCL, the CEO was involved throughout the restructuring process. He communicated his support to the change activities by personal involvement, and regular appreciation to the change management team and the special task forces. He played the role of a mentor to the team members. He also interacted with a large number of employees during the visioning, assessment and implementation stages. Young managers recount stories of his support to the change team, where he gave total freedom to come up with creative ideas and safe guarded them from backlashes from established constituencies. This exemplifies a leader being a role model in knowledge sharing activities including inspiring leadership at

all levels, both management and non-management. This further exemplifies a leader encouraging members to learn as well as inspiring a clear, shared sense of team work and empowerment within an organization.

The co-created shared vision set by the CEO, Mr. U Sunderajan during the process of restructuring BPCL, demonstrates his commitment to learning and to creating a learning organization. These companies have business operations in multiple product markets. The corporate role in all three companies reflects the ability to control the operations of SBUs and to seek coherence in business operation so that the inventory of resources and capabilities are upgraded and updated. Leaders have been able to design organizational policy, create strategies that integrated vision, value and purpose. Further, leaders have been able to inculcate a sense of purpose in minds of employees at large, encouraging team work and risk taking.

Post-restructuring, the business planning has been a bottom-up approach with a set of strategic directions from the strategic apex. This has been driven by the balanced scorecard based performance management system for all managerial employees. This has resulted in giving opportunity to the teams to set their goals under the overall strategic direction of the corporation. Leaders have thus facilitated employees' self-regulation by finding ways to set goals. Leaders also have helped in individual goal setting and creating a

framework for timely performance feedback.

### **Communication dynamics that facilitate knowledge sharing:**

In 2008, BPCL earned the prestigious Association of Business Communicators of India (ABCI) awards, primarily in the Web Communication category, with the Intranet and Corporate Website Promotions winning the Gold Awards and the e-magazine, Petrozine winning the Silver Award. This encourages communication as a way to enhance knowledge; encourages a chance for all employees to enhance participation and contribution concerning critical activities; create effective communication of vision and purpose to all members; and create communication which is transparent with direct as well indirect stakeholders including the community (BPCL\_Awards, 2008).

Communication between management and non-management has been a critical aspect in all the three companies owing to presence of strong trade unions. Over a period of time, all the managements have been able to use the information technology (IT) channels to automate interaction with a view to improve knowledge and insights with the organizations.

Overall the communication practices reflect both formal and informal channels of communication "(a) fast, clear and focused; (b) open and shared; (c) conducted in a climate of trust-a blame free

culture in which members feel free to report error”.

### **Knowledge transfer that facilitates knowledge sharing**

Knowledge transfer can be seen considering the nature of knowledge, which is broadly classified as either tacit or explicit (Crossan, 2016). Tacit knowledge is embedded in individuals. Its transfer requires sophisticated media and context. The perspective of shared vision, performance management based on balanced scorecard and the IT communication infrastructure and channels exemplify the presence of strong media and context for effective tacit knowledge transfer. The organizational hierarchy capturing the formal channels of communication, systems and process exemplify the ability to transfer explicit knowledge which can be codified and documented. Knowledge transfer has been (a) taking place within and across organizational boundaries; (b) circulated from one individual to another; (c) providing opportunities and an information base for members to continue an innovation of products or services and processes; (d) observed by rapid and effective flow of knowledge across hierarchy and stored within an explicit form of organizational memory; (e) distributed through advanced information technology; and (f) ensured by

the positive motivation of organizational members.

### **Employee quality that facilitates knowledge sharing**

All three companies have identical recruitment and selection process. Being companies in the public sector, recruitment and selections are subject to a lot of public scrutiny. Recruitment and selection are conducted in two routes, (a) open recruitment and (b) campus recruitment. A rigorous process consisting of inviting application through public media, scrutiny, tests (both written and oral) is followed for open recruitments. Senior members in teams visit top tier schools of technology and management to recruit technical and management graduates through campus recruitment<sup>24</sup>. They also recruit Chartered Accountants from various centers of the Institute of Chartered Accountants of India (ICAI). All three companies induct officers at the junior-most level of the management hierarchy (A Grade). The growing number of job application reflect the high quality of talent which the oil companies are able to attract. A systematic on-board training and orientation, job rotation and inter-location transfers throughout the country facilitate planned development of careers and broaden outlook of the talented graduates.

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<sup>24</sup>The process has been done away with since 2014 consequent to result of a court case. Accordingly all recruitments are done through the direct route. The short listing for technical graduates is based on GATE score and the same for management graduates is UGC-NET score.

Career growth is based on the individual performance and contribution to the common goal of sustained growth. Most of the industry's top executives started their careers as officers/ executives in entry level, a testimony to the unlimited opportunities for growth available to the meritorious management staff. This exemplifies collective knowledge, understandings, outlook, image and open minded communication; pledge to produce and transfer first-hand knowledge; interaction and facilitation; and the ability to work in team.

### **Knowledge Utilization**

In the following section, evidence concerning the ability to accumulate knowledge in a location where it can be retrieved easily for application when needed is discussed for the three companies-IOCL, HPCL, and BPCL.

**Organizational memory:** The key to knowledge utilization is knowledge management and organizational memory. Organizational memory is an implicit and explicit stock of organizational knowledge.

In BPCL, the activities on the learning and growth perspective are very clearly set out supported with due documentation. The input from the assessment and development processes are also set out clearly and documented. There exists a set of systems and processes for storing and using both implicit and explicit knowledge. The processes capturing organizational routines and networks through cluster of professionals support managing implicit

knowledge in particular. Knowledge as a resource base is implanted both in forms and structural routines in all three companies.

Further, in BPCL, the Integrated Information Systems (IIS) team had launched "Project Aryabhata" to redefine knowledge management strategy for BPCL for the next 3 to 5 years. Key themes had been identified, which would help businesses achieve their targets and sustain BPCLs leadership in the knowledge management sphere in the oil and gas sector. One of the first initiatives undertaken was the implementation of the solution to manage the supply chain (SCM) in the LPG business to optimize bulk product movement, product bottling, packed movements and hospitality arrangement with other oil marketing companies. It has resulted in significant savings on cost of inbound and outbound logistics. The project has been completed in a record period of 100 days by an in-house team drawn from the business and IIS with minimum support from external consultants. Since April 2008, the demand projections are being captured in the SCM solution at the distributor level. Based on the demand, planning projection in the system, all orders are getting generated in the SAP system. Again During 2008, a Business Intelligence group was formed for harnessing knowledge for business applications. Dashboards for Territory Managers in the different businesses have since been launched. The focus has been on the knowledge needs of the customer

facing staff. With the active engagement of the businesses, Business Intelligence reports have been designed and made available to the field force, thereby giving deep insights into customer behavior and providing up- to-date data. This exemplifies storage of organizational knowledge in explicit forms such as working guidelines and computerized databanks.

### **Culture in organizations contributes to knowledge utilization**

Over a period of time, a learning culture appears to have developed in the three companies. In BPCL, the retail business has been achieving success through mobilizing people and teaming at various levels, encouraging a culture of focused thinking and decisive action among staff, resorting to new and innovative means of overcoming obstacles in execution of plans. Because of aggressive, marketing of its propositions, the retail business was able to achieve higher growth position in the fuels market with sales of 25.38 MMT during 2015-16, showing an impressive growth of 5.1% over 2014-15. Initiatives in IOCL reflect continuous improvement in operations and maintenance through harnessing inherent strengths of employees. A series of learning and development programs are in place aimed at building critical management skills. The calendar of learning and development activities has been integrated to the work plan of employees at all levels, thereby enhancing the level of commitment for competency development. The

eLearning portal with interactive learning modules have helped HPCL to strengthen the learning culture. The portal receives self-nomination without having to assign employees to learning programs, a reflection of higher level of commitment for competency development.

### **Empowerment and leadership that facilitate knowledge utilization**

The business functioning in BPCL is reflected in the decision rights and rules. For instance, all capital expenditure proposals in a retail territory need to be cleared by the territory team comprising of the territory manager, area sales officer, area engineering officer and the area operations in-charge. Similar team based decision making has been observed in the lubricants business in IOCL. In the retail strategic business unit of BPCL, the role of the regional manager has been limited to facilitating the functioning of the territory teams and managing the interface with other interdependencies. Senior managers now have critical role in fostering use of technology to share knowledge for value creation. With this profile of delegation of decision rights and empowerment of the operating units, the senior managers devote their time to designing business policies that integrate with strategic direction.

### **Knowledge transfer that contributes to knowledge utilization**

All three companies have employed advanced information technology to gain and disseminate organizational knowledge.

For instance the year 2007-08 was eventful and marked with many significant achievements in the IIS domain of BPCL. The year saw a strategic thrust being given to the future IT road map of the organization. Besides, BPCL's internal team has successfully upgraded the SAP HR module to SAP ERP ECC 6.0. The upgrade would help in the implementation of Employee Self Service (ESS)/ Management Self Service (MSS) besides several new age functionalities. Work has commenced on the upgrade of the non-HR modules to ERP ECC 6.0. Once rolled out, the SAP user base will increase significantly and make improved functionalities available. BPCL has also migrated to SAP Net Weaver XI Middleware, which would be the single solution utilized for interfaces with customers, vendors, dealers, distributors and others. This makes organizational knowledge freely available. Knowledge transfer has provided an information base for members so they can engage in product and process innovation making organizational knowledge useful.

### **Employee quality that facilitates knowledge utilization**

In HPCL, more stress has been laid on learning not only to improve the competences of the employees, but also to update their functional skills. The learning programs have a judicious mix of in-house and external input. Employees thus (a) realize their purpose and how their efforts are aligned to organizational goals; (b) develop the skill sets such as

teamwork; (c) create workplace problem solving and innovation competencies; and (d) enabled to lead from whatsoever position they hold. Similarly, in BPCL, employees are enabled to lead from whatsoever position they hold owing to the focus on team based interdependent functioning.

### **Capability upgrading facilitates knowledge utilization**

In BPCL and HPCL, use of a balanced scorecard approach to strategic management and performance management has been the hallmark to capability upgrading with respect to achieving productivity and growth by addressing the issues concerning internal processes and capabilities in particular. Both companies have been able to access capability gaps and have taken timely action to bridge the gaps to achieve substantial productive gains and growth. This is reflected in the strategic map showing a network of cause and effect relationships with the four perspectives-financial, customer, internal process and learning and growth. In IOCL there are similar efforts to benchmark best practices and share the same across business processes.

### **Conclusion**

The analysis of the secondary data in the three companies reveals presence of the significant learning organization characteristics. The three stages of development of learning organizations-"knowledge acquisition; knowledge

sharing; and knowledge utilization”-clearly reflect in the three companies. These three stages are influenced by six dimensions-culture in organizations; empowerment and leadership; communication dynamics; knowledge transfer; employee quality and capability upgrading. The companies have therefore demonstrated the potential to become learning organizations.

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# Determinants of Dividend Policy for Select Information Technology Companies in India: An Empirical Analysis

**Souvik Banerjee**

Assistant Professor,

Acharya Bangalore Business School, Bangalore, India

souvik.2005@gmail.com

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## ABSTRACT

*Determinants of Dividend Distribution are one of the hotly debated topics in corporate finance. In this research paper top 4 Information Technology (IT) companies in India are analysed over a span of 5 financial years. Three factors namely Leverage, PE Ratio, and Return on Equity are found to be statistically significant, as far as Dividend Distribution Decisions are concerned. This is a significant addition to the theory on Determinants of Dividend Distribution, especially in the Indian context.*

**Key Words:** *Dividend Distribution, Leverage, PE Ratio, Return on Equity*

## Introduction

Distribution of profit to shareholders is termed as dividend (Pandey, 2004). Profit earned by companies can be retained by them for future usage, or can be returned to shareholders as dividends. Each business organization, has their own unique circumstances to take a very strategic decision with regards to the money generated through profit, i.e. whether to keep retain it or to return it to the shareholders. A number of conflicting theories have also been developed with respect to this (Alkuwari, 2009). The pertinent in this respect to note that

“The harder we look at the dividend picture the more it seems like a puzzle, with pieces that just do not fit together” (Black 1976). There are different theories on

dividend payment, and they deal with whether dividend payment increases or decreases the valuation of the company. It is not difficult to identify the variables which affect the dividend payment Information Technology sector in India is one of the few areas where India became globally competitive. According to a report prepared by India Brand Equity Foundation (IBEF), India approximately counts for sixty seven per-cent of the global outsourcing market of US\$ 130 billion. According to the industry body NASSCOM (National Association of Software and Services Companies) data, the industry employ close to 10 million people putting together both direct and indirect employment.

## **Literature Review:**

Krishman (1963) propagated a bird in the hand theory, regarding dividend distribution. According to this theory investors are risk averse by their very nature. Linter (1962), Gordon and Shapiro (1956) got support for this theory, through their research. The underlying logic for this behaviour was that returns from the equity market is uncertain, also there is considerable information asymmetry in the system, as a result, investors will like dividend payment, as it transfers money from the company to the investors. On the other hand 'Agency Theory', propagated by Jensen (1986), argues that the dividend payment restricts the fund available to managers, as far as investment in new projects is concerned.

Lintner (1956) focussed on the behavioural side of the policy regarding Dividend Payment Decisions. He concluded that the managers take the decisions to increase the proportion of Dividend Payment, only when they are certain that the firm's earnings have increased permanently. Brittain (1966) studied the Dividend Payment Policy and tax structure, over a long period (1919-1960) of time and concluded that, the principal determinant of Dividend Payment Policy decisions are Cash Flow of firms, and not the Net Profit figure. On the other hand Fama and Babiak (1968), concluded that Net Profit is a better determinant of Dividend Payment, than either the Cash Flow figures or the Net Profit and the

Depreciation figures are taken separately, they reached this conclusion, on the basis of data analysed of 392 major firms, on a timeframe of 1946 to 1964.

In the Indian context, there are certain studies, in this regard. For example, Rao and Sarma (1971) concluded that Lintner model can explain the Dividend Payment Decisions, in industries such as coal mining, sugar, jute textiles, chemical, and cement industries. Bhattacharya (1979) was of the view that bird in hand hypothesis is not proper. Moreover, it was further suggested, that the firm's level of risk assumption affects the level of dividend. Bhat and Pandey (1994) found support of Lintner's model in the Indian context, which proved that Indian managers increased the level of dividend, only when they became absolutely certain about the permanent nature of the increase in profitability.

Mishra and Narender (1996) tested the Lintner's model of Dividend Payment on Public Sector Units (PSUs) in India. The study concluded that, the number of Dividend Paying PSUs compared to the total number of PSUs is quite small. The study also came to the conclusion that, the Dividend Payment Ratio (DPR), remain constant for most of the companies, even if the Earning per Share (EPS) figure shows a constant improvement. On the other hand Saxena (1999) found that, past revenue growth rate, future earnings forecast, how many shareholders a company has, and systematic risk act as

the Determinants of Dividend Pay-out Policy.

Naceur, Goaid and Belanes (2006) tested Lintner's model in the context of Tunisian companies. This research found that, Tunisian firms follow a stable dividend policy; it also found that the primary determinant of Dividend Payment decisions is current earnings, instead of past Dividend Payment decisions. Husam et al (2007) examined the determinants of corporate dividend policy in the context of Jordanian companies. This research endeavour found that, the proportion of ownership by insiders and the government are important determinants of Dividend Payment decisions; other determinants are size, age, and profitability of the firm. Naeem and Nasr (2007) concluded on the basis of their research on Pakistan based companies, that the companies are either reluctant to pay dividends or pay very less amount of dividend. The main determinants of Dividend are profitability of the companies and their previous year's Dividend Payment rate.

Kuwari (2009) researched on Determinants of Dividends in the context of Gulf Co-operation Council (GCC) countries, this particular study found that, the primary intention of paying dividend is reduction of agency cost. This study also found that, the firms do not look for long term target as far as Dividend Pay-out Ratio is concerned. The study concluded that, Dividend Pay-out Ratios have strong positive correlation with Ownership

Structure, Firm Size, Firm Profitability, and negative correlation with the Leverage Ratio.

### **Objective of the Research:**

In this research endeavour, the objective is to check what determines the Dividend Payment decisions in the listed Indian companies. The primary objective of this research is to understand the effect of Size, Profitability, PE Ratio, Leverage Ratio, and Liquidity Ratio of the companies on Dividend Payment decisions of the firms.

### **Hypotheses:**

The null hypotheses of the research are depicted below

- H01- Size of the company has a no effect on the dividend policy.
- H02- Profitability of the companies has no effect on the dividend policy.
- H03- PE Ratio of the companies has no effect on the dividend policy.
- H04- Leverage Ratio of the companies has no effect on the dividend policy.
- H05- Liquidity Ratio of the companies has no effect on the dividend policy.

### **Research Methodology:**

#### **Variables Used:**

In this research endeavour Dividend Pay-out Ratio of the firm is taken as the dependent variable, whereas Size, Profitability, Risk, Leverage, and Liquidity of the firm are taken as the independent variables.

The Size of the firm is computed as the natural logarithm of the book value of the firm's Total Assets. This method is in accordance with Joseph (2001).

Profitability of the firm is measured by three parameters, i.e. Return on Equity (ROE), Return on Assets (ROA), Earnings per Share (EPS).

ROE = Net Profit after Preference Dividend/Book Value of Equity Capital

ROA = Net Profit/Total Assets

EPS = Net Profit/ Number of Equity shares outstanding. This is taken in terms of Indian Rupees.

The Risk is measured by PE Ratio.

PE Ratio= Market Price of One Share/ Earning per Share

Leverage = Total Debt (Short Term Debt as well as Long Term Debt)/Total Shareholder's Fund.

Liquidity = Current Ratio (CR) = Current Assets/Current Liabilities

Dividend Pay-out Ratio (DPR) = Cash Dividend/Net Profit \* 100

Profitability, Risk, Leverage, and Liquidity are taken in accordance to the method adapted by Mehta (2012).

**Data Used:**

The source of the data for this research has been Capital Market and Securities Exchange Board of India (SEBI) databases. The companies are chosen from the Cement sector in India. The period of the study, which is taken into account is five years period starting from 1<sup>st</sup>. January, 2010 to 31<sup>st</sup>. December, 2014. The sample selection framework is in accordance to Gupta and Banga (2010). In total 4 top listed IT companies are taken into account. These 4 companies are the top 4 IT companies listed in Indian stock exchanges, in terms of revenue. The companies considered for analysis in this study are TCS Ltd., Infosys Ltd., Wipro Ltd., and HCL Technologies Ltd.

**Results:**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.404a	0.163	0.202	33.05
2	0.543b	0.295	0.219	32.87
3	0.576c	0.332	0.302	32.98
4	0.692d	0.479	0.442	33.01
5	0.712e	0.507	0.483	33.07

- a. Predictors: (Constant), PE Ratio, CR, LEV, EPS, ROA, LTA, ROE
- b. Predictors: (Constant), PE Ratio, CR, LEV, EPS, ROA, ROE
- c. Predictors: (Constant), PE Ratio, CR, LEV, EPS, ROE
- d. Predictors: (Constant), PE Ratio, LEV, EPS, ROE
- e. Predictors: (Constant), PE Ratio, LEV, ROE

**Table: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.014	3.452		0.406	.532		
PE Ratio	1.604	0.456	-0.224	4.346	0.001	0.674	1.548
LEV	3.402	0.345	0.354	5.462	0.005	0.542	1.688
ROE	4.065	0.455	0.456	7.080	0.002	0.754	1.243

Dependent Variable: DPR

The step wise regression model, used here, gradually removed the insignificant predictors one by one. The final model, with three predictors namely PE Ratio, LEV, and ROE can explain 50.7% of the variations in the Dividend Payment decisions. This is quite an improvement over 20.7% explaining capability of the initial model, as depicted by the R-Square values.

The fitted regression equation is:

$$\text{DPR} = 0.014 + 1.604[\text{PE Ratio}] + 3.402[\text{LEV}] + 4.065[\text{ROE}]$$

All the three predictors namely, PE Ratio, LEV, and ROE are statistically significant, even at 5% level. All the three factors have positive influence on the dependent variable (DPR).

### Conclusions

Firms with higher PE Ratio are high growth firms, so it is natural that these firms pay higher dividend. Similarly higher Leverage for firm, results in higher portion of the profit is left for the equity holders. So it is no wonder that, firms with higher Leverage have higher DPR. ROE is intrinsically related, to return of the equity

holders, so higher ROE results in higher DPR. These findings are in line with the existing literature. This study was done on a period, when Indian equity markets saw some of the exciting phases, and touched new all-time high. This research covered the 4 biggest IT services companies in India. This should be an important addition to the existing literature on Dividend Payment decisions, especially in the context of the Indian capital market.

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## Organisational Conflict Literature: A Review

**Rabinarayan Samantara**

Associate Professor at Shivaji College, University of Delhi  
dr.rabisamantara@gmail.com

**Nidhi Sharma**

Assistant Professor at Shivaji College in the University of Delhi  
nidhisharma810@gmail.com

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### ABSTRACT

*The present research involves a review of organisational conflict literature in an integrated framework. In addition to exploring such basic issues related to organisational conflict as conceptual meaning and definitions of conflict, antecedent conditions or determinants of conflict, desirability of conflict, etc., the paper specifically focuses upon the internal dynamics of a conflict episode. More significantly, the paper highlights the fact that conflict can have either functional or pathological effects depending upon its management. The findings of various research studies analysed point to the fact that the levels of conflict as well as the styles of handling conflict can be suitably varied in different organisational situations with a view to enhancing organisational effectiveness.*

**Key Words:** Conflict, Dynamics, Antecedents, Effects, Management

### Introduction

Organisational conflict has been a fascinating subject of study for most researchers and practitioners. While most researchers agree on the inevitability of conflict in organisations as well as on the need to manage them constructively, the literature relevant to organisational conflict is somewhat segmented (Thomas, 1976) and is specialised according to organisational areas e.g. labour-

management relations (Stagner, 1956; Stagner & Rosen, 1965), line-staff controversies (Dalton, 1950; McGregor, 1957), superior-subordinate conflicts (Evan, 1965; Burke, 1970; Renwick, 1975), inter-departmental disputes (Lawrence & Lorsch, 1967), etc. At this point, it must be emphasised, however, that the dynamics underlying conflict behaviour in one area have immense

relevance to other areas as well. Moreover, a large volume of research undertaken outside the boundaries of organisations (e.g. experimental gaming, small group research, social conflict, international relations etc.) has yielded concepts and insights of great potential relevance to the study of conflict in organisational settings. The contribution of such outside research to available knowledge regarding industrial and organisational conflict cannot be lost sight of. In view of the aforesaid facts, an attempt has been made in the present paper to provide a more fundamental and generic treatment of conflict covering all organisational areas.

### **Conceptual Meaning of Conflict**

In the Behavioural Sciences, the term 'conflict' has no single, clear referent. According to the psychologists, the term often denotes incompatible response tendencies within an individual e.g. "approach-avoidance conflict" (Levinger, 1957), "role conflict" (Kahn *et.al.*, 1964), etc. In the sociological parlance, on the other hand, attention is focused on that type of conflict that occurs between social units i.e. between individuals, groups or organizations. These conflicts are known as inter-personal, inter-group or inter-departmental (Wall & Callister, 1995) or inter-organisational conflicts respectively.

There is no consensus among researchers even on a specific definition of conflict. It has been variously defined by different authors. In a review of conflict

literature, Fink (1968) found a large number of divergent usages, including 14 different criteria for simply distinguishing conflict from competition. Within the organisational conflict literature, Pondy (1967) noted a number of divergent definitions ranging over antecedent conditions, emotions, perceptions and conflictful behaviour. Rather than attempting to agree that one of these specific definitions was really conflict, Pondy (1967) recommended that conflict should be used in a generic sense to include all these phenomena.

In the absence of any consensus on the conceptual meaning of conflict, it is but quite natural that the term 'conflict' has been variously defined by different social scientists. Nevertheless, a few commonly given definitions of conflict which provide some indications as to the meaning of conflict may be presented here. According to Robbins (1974), Conflict is a process in which an effort is purposefully made by one person or unit to block another that results in frustrating the attainment of the other's goals or the furthering of his or her interests. Thomas (1976) views conflict as the process which begins when one party perceives that the other has frustrated or is about to frustrate some concern of his. Katz & Kahn (1978) view that two systems (persons, groups, organisations, nations) are in conflict when they interact directly in such a way that the actions of one tend to prevent or compel some outcome against the resistance of the other. According to Chung & Megginson (1981),

conflict refers to the struggle between incompatible or opposing needs, wishes, ideas, interests or people; it arises when individuals or groups encounter goals that both parties cannot obtain satisfactorily. Kabanoff (1986) opines that Conflict is the result of incongruent or incompatible relationships between members of a group or dyad. According to Roloff (1987), Organisational conflict occurs when members engage in activities that are incompatible with those of colleagues within their network, members of other collectivities, or unaffiliated individuals who utilize the services or products of the organisation. Hellreigel, Slocum, & Woodman (1992) define conflict as any situation in which incompatible goals, attitudes, emotions and behaviours lead to disagreement or opposition between two or more parties. Steers & Black (1994) define Conflict as the process by which individuals or groups react to other entities that have frustrated or are about to frustrate their plans, goals, beliefs or activities.

Some authors also include the environment as a constituent element of the inter-relationship (Applefield, Huber, & Moallem, 2000; Coy & Woehrle, 2000; Demmers, 2006; Lederach, 2000). According to Mayer (2000) conflict is “a feeling, a disagreement, a real or perceived incompatibility of interests, inconsistent worldviews, or a set of behaviors.” Conflict has also been referred to as differences between individuals or groups relating to interests, beliefs, needs and values (De Dreu, Harinck, & Van Vianen, 1999).

Rahim (2002) conceptualizes conflict as “an interactive process manifested in incompatibility, disagreement or dissonance within or between social entities (i.e. individual, group, organisation, etc.)”. According to Rahim, conflict may occur when:

1. A party is required to engage in an activity that is incongruent with his or her needs or interests.
2. A party holds behavioural preferences, the satisfaction of which is incompatible with another person’s implementation of his or her preferences.
3. A party wants some mutually desirable resource that is in short supply, such that the wants of everyone may not be satisfied fully.
4. A party possesses attitudes, values, skills, and goals that are salient in directing his or her behaviour but are perceived to be exclusive of the attitudes, values, skills, and goals held by the other(s).
5. Two parties have partially exclusive behavioural preferences regarding their joint actions.
6. Two parties are interdependent in the performance of functions or activities.

Thus, on the whole, it can be concluded that a conflict situation is primarily the result of differences on account of issues related to a task or inter-personal relationships (Ongori, 2010). It is “the substantive issue in which the tension

is rooted” (De Dreu, Harinck, & Van Vianen, 1999). Task conflicts result from disagreements within the group or among groups as to the content of the task or how it should be performed (procedure for accomplishing goals) whereas relationship conflicts are a result of interpersonal incompatibilities and manifest as tension, animosity among group members (Jehn, 1995).

### **The Dynamics of Conflict**

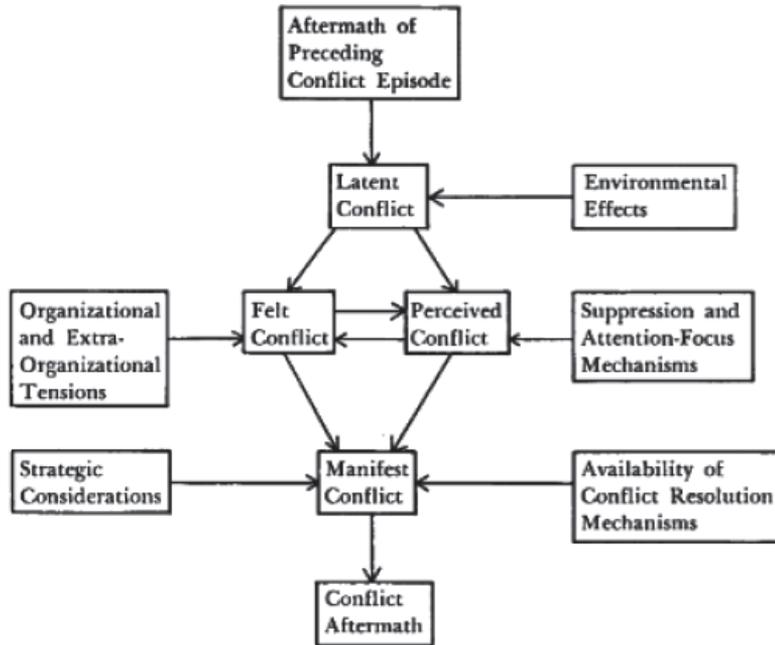
It was observed by Pondy (1967) and Walton and Dutton (1969) that conflict in a dyadic relationship tends to occur in cycles. In other words, a conflict relationship between two individuals or other social units can be analyzed as a sequence of conflict episodes. Each conflict episode is partially shaped by the results of previous episodes and in turn, leaves an aftermath that affects the course of succeeding episodes.

Five stages of a conflict episode were identified by Pondy (1967) as can be seen from Figure 1. These stages are (1) latent conflict (antecedent conditions), (2) perceived conflict (cognition), (3) felt conflict (affective stages e.g. stress, tension, anxiety, hostility, etc.), (4) manifest conflict (conflictful behaviour ranging from passive resistance to overt aggression), and (5) conflict aftermath (outcomes/consequences). Pondy (1967) concentrated on three basic types of latent conflict: (1) competition for scarce

resources (2) drives for autonomy and (3) divergence of sub-unit goals. The next important stage of a conflict episode involves the cognitive states of individuals i.e. their perception or awareness of conflictful situations. It may be noted that conflict may sometimes be perceived when no conditions of latent conflict exist, and latent conflict conditions may be present in a relationship without any of the participants perceiving the conflict. Felt conflict refers to the affective state of individuals involved in a conflict situation (e.g. stress, tension, hostility, anxiety, etc.). Manifest conflict results when an individual member of an organization consciously engages in behaviour that blocks another member’s goal achievement. Manifest conflict may mean any of several varieties of conflictful behaviour, ranging from passive resistance to overt aggression.

It may be reemphasized that each conflict episode is nothing but one of a sequence of such episodes that constitute the relationships among organization participants. If the conflict is genuinely resolved to the satisfaction of all participants, the basis for a more cooperative relationship may be laid. On the other hand, if the conflict is merely suppressed but not resolved, the latent conditions of conflict may be aggravated and explode in more serious form until they are rectified or until the relationship dissolves. This legacy of a conflict episode is here called “conflict aftermath”.

**Figure 1**  
The Dynamics of a Conflict Episode



Source: Pondy, L. R. (1967). Organisational Conflict: Concepts and models. *Administrative Science Quarterly*, (12), 296-320.

### Antecedents to Organizational Conflict

As it was pointed out at the beginning, the literature on organisational conflict has been somewhat compartmentalized, dealing mostly with certain specialized organisational arenas. So it is but quite natural that the organisation theorists have attempted to analyze the determinants of organisational conflict in the context of interest-group conflicts, inter-personal conflict, inter-departmental disputes, and so on. However, such isolated attempts made to deal with casual factors related only to a narrow segment of organisational conflict at one time have only stood in the

way of development of a comprehensive theory of conflict and conflict management.

Conflict situations in organizations may be triggered due to several factors. In the present section, an endeavour has been made to integrate the determinants of organisational conflict as emphasised by sociologists and other behavioural scientists. The various determinants or underlying sources of conflict discussed are: competition for scarce resources, mutual task dependence, organisational differentiation, identity concerns, performance criteria and rewards, barriers

to communication, ambiguities, personality attributes, hierarchical differences in prestige, power and knowledge, role dissatisfaction, drive for autonomy, and need for tension release.

### **Competition for Scarce Resources**

Conflict potential exists among interest groups where there is a discrepancy between aggregated demands of the competing parties and the available resources (Thibaut & Kelley, 1959). There is often conflict between labour and management over their respective share of enterprise profits; departmental units often compete for scarce organisational resources such as physical space, equipment, manpower, capital funds and centralised services (e.g. typing, drafting etc.); and so on. Walton (1965) describes such conflicts as complex relationships which involve both integrative (cooperative) and distributive sub-processes. Each party to the conflict has an interest in making the total resource as large as possible, referred to as “*expanding the pie*” (Pruitt, 1981) or “*creating value*” (Lax & Sebenius, 1986; Olekalns, 1997) but also in securing as large a share of them as possible for itself – a process referred to as “*claiming value*” (Lax & Sebenius, 1986; Olekalns, 1997). Conflict due to scarce resources is also referred to as the Bargaining Model of conflict due to the dynamics involved (Pondy, 1967). The integrative sub-process is largely concerned with joint problem solving to maximize outcomes (Pruitt, 1981), and the distributive sub-

process with strategic bargaining.

### **Mutual Task Dependence**

Task dependence is the extent to which two functional units operating at the same hierarchical level depend upon each other for assistance, information, compliance or other coordinative acts in the performance of their respective tasks. Important types of interdependence matter are: (1) common usage of some service or facility, (2) sequence of work or information flow prescribed by task or hierarchy, and (3) rules of unanimity or consensus about joint activity. This type of conflict occurs mostly among groups or individuals engaged in a functional relationship and is also referred to as the Systems Model of conflict (Pondy, 1967). Dutton & Walton (1966) indicate that task-dependence not only provides an incentive for collaboration, but also presents an occasion for conflict and the means for bargaining over interdepartmental issues. As the sub-units often have different sets of active goals (Simon, 1964) or different preference orderings for the same sets of goals, ample scope for inter-unit conflict exists.

### **Organizational Differentiation**

It is commonly acknowledged that uniform tasks require a bureaucratic type of organization whereas non-uniform tasks require a human relations organization. In the present day society, most large-scale organizations have to deal with both uniform and non-uniform tasks, and most combine these contradictory forms of

social relations into a professional model. Litwak (1961) regards the inclusion of these contradictory forms as a source of organisational conflict.

Lawrence & Lorsch (1967) emphasized the effects of differentiation on organisational conflict. Where each of the functional units (such as production, sales or research) performs a different type of task and copes with a different segment of the environment, the units will develop significant internal differences among themselves with respect to their: (a) degree of structure; (b) interpersonal orientation; (c) time orientation; and (d) goal orientation. Lawrence & Lorsch believe that this four-fold differentiation is largely a response to the degree of uncertainty in the relevant environments of different departments. They found that such differentiation between organisational units posed an obstacle to integration or coordinative processes, thus yielding ample scope for inter-unit conflict.

### **Identity Concerns**

Identity concerns (Mayer & Louw, 2009) of individuals in terms of their self concepts such as feelings of being knowledgeable, confident, experienced, etc. have a profound influence on organisational conflicts. In his conceptual analysis of inter-organisational decision making, Walton (1972) views that the identity concerns of organizations are of crucial significance in the choice of strategies (to be made for making joint decisions) as well as their potential

consequences. If the identity needs of two parties are compatible (i.e. identity reinforcement), the parties are more likely to resort to problem-solving and exploit their integrative potential with a view to maximizing the joint gains available to them. However, when the preferred identities are in conflict (i.e. identity conflict), the parties are more likely to engage in bargaining behaviors and obtain sub optimal decisions.

### **Performance Criteria and Rewards**

Inter-departmental conflict arises when each of the interdependent units has responsibility for only one side of a dilemma embedded in organisational tasks. Dutton and Walton (1966) noted that the preference of production units for long, economical runs conflicted with the preference of sales units for quick delivery to good customers. Dalton (1959) observed that staff units valued change because that was one way they could prove their worth, whereas line units valued stability because change reflected unfavorably upon them. While such dilemmas underlying inter-departmental differences are inherent in the total task, the reward system (Alper, Tjosvold, & Law, 2000) designed by management may either increase or dissipate their divisive effects. The more the reward system emphasizes the separate performance of each department rather than their combined performance, the greater is the likelihood of conflict to occur.

## Barriers to Communication

Research findings have indicated that semantic differentials can impede communication essential for cooperation. This challenge is especially heightened in the current globalized economic environment with diverse interacting cultures (Mayer & Louw, 2009). Straus (1964) observed that differences in the training of purchasing agents and engineers contributed to their conflicts. March & Simon (1958) stated that organisational channeling of information introduced bias. In an empirical investigation of the causes of inter-departmental conflicts, Walton and Dutton (1969) used three measures of conflict, typically characteristic of the bargaining type of decision processes (a) distrust; (b) overstatement of departmental needs; and (c) lack of consideration of another department's needs. It was postulated that reducing the levels of the above three conflict variables would promote problem-solving behaviors. The results of the study revealed that communication-inhibiting factors were most significantly related to the composite measure of the conflict variables.

## Ambiguities

Ambiguity contributes to inter-departmental conflict in many different ways. Difficulty in assigning credit or blame between two departments increases the likelihood of conflict between units. Dalton (1959) attributed part of the line-staff conflict he observed to the fact that although improvements required

collaboration between line and staff units, it was later difficult to assess the contribution of each unit. Similarly, Dutton and Walton (1966) found that conflicts arose between production and sales units when it could not be determined as to which department made a mistake. Low routinisation and uncertainty of means to goals increase the potential for inter-unit conflict. This proposition is supported by Zald (1962) in his study of inter-unit conflict in five correctional institutions. Ambiguity in the criteria used to evaluate the performance of a unit may also create tensions, frustration, and conflict (Kahn *et al.*, 1964).

## Personality Attributes

A review of experimental studies led Walton & McKersie (1965) to observe that certain personality attributes such as high authoritarianism, high dogmatism, and low self-esteem increase conflict behaviour. Kahn *et al.* (1964) found that in objective role conflict, persons who scored lower on neurotic anxiety scales tended to depart more from "cordial, congenial, trusting, respecting and understanding relations". A person with a narrow range of behavioral skills is less likely to exploit the integrative potential fully in an inter-unit relationship. He may either engage in bargaining to the exclusion of collaborative problem-solving, or withdraw or become passive (Walton & McKersie, 1966). Dalton (1959) and Thompson (1960) found that personal dissimilarities such as education, social patterns, values, background, age, etc.

lowered the probability of inter-personal rapport between departmental representatives, and in turn, decreased the amount of collaboration between their respective units.

### **Hierarchical Differences in Prestige, Power and Knowledge**

Inter-unit conflict is produced by differences in the way units are ranked along various dimensions of organisational status such as direction of initiation of action, prestige, power and knowledge. As reported by Seiler (1963), when the sequential pattern of initiation and influence followed the status ordering among departments, it was acceptable to all. However, where a lower-status unit needed to direct a higher-status unit, the result was break-down in inter-unit relationships. In his study of correctional institutions, Zald (1962) offered an explanation of the effects of relative power. With mutual task dependence and divergent values among the three units studied, conflict occurred as expected between units that are unable to control the situation and those perceived as being in control. Inconsistency between the distribution of knowledge among departments and the lateral influence patterns are also a source of conflict. Lawrence & Lorsch (1967) observed that the more the influence of each unit is consistent with key competitive factors, the more effectively will the inter-unit issues be resolved.

### **Role Dissatisfaction**

Role dissatisfaction stemming from a variety of sources can be a source of conflict. Dalton (1959) found that blocking status aspirations in staff members led to conflict with other units. In these cases, the professionals felt that they lacked recognition and opportunities for advancements. Similarly, where one unit internally reports on the activities of another unit, resentment can occur, as with staff units reporting to management on production irregularities (Dalton, 1959). Argyris (1964) and Dalton (1959) both have argued that role dissatisfaction and conflict would follow where one unit with the same or less status set standards for another.

### **Drive for Autonomy**

Superior-subordinate conflicts in an organization usually arise because superiors attempt to control the behaviour of subordinates, and subordinates resist such control. The subordinate is likely to perceive conflict when the superior attempts to exercise control over activities outside the "zone of indifference" (i.e. over activities perceived to be outside the latter's jurisdiction), and the superior perceives conflict when his attempts at control are thwarted. A typical bureaucratic reaction to subordinate resistance is the substitution of impersonal rules for personal control. Such imposition of rules defines the authority relation more clearly and robs the subordinate of the autonomy provided by ambiguity. The

subordinate, therefore, perceives himself to be threatened by and in conflict with his superiors, who are attempting to decrease his autonomy.

### **Need for Tension Release**

Another important underlying source of organisational conflict is the human need for tension release (Coser, 1967; Pondy, 1967). It has been observed in organizations that the inconsistent demands of efficient organisational and individual growth often create anxieties within the individual (Argyris, 1957). Anxiety may also result from identity crisis from extra-organisational pressures. Individuals need to ventilate these anxieties in order to maintain internal equilibrium. In fact, latent conflicts of various types provide defensible excuses to individuals for displaying their anxieties against suitable targets.

### **Effects of Conflict**

The traditional view of conflict assumed that conflict is essentially negative in character and is detrimental to the attainment of organisational objectives. However, the contemporary management thinkers conceive of conflict as a multidimensional concept, i.e. both negative and positive in character (Tjosvold & Chia, 1989). Van de Vliert and colleagues (1999) stated that “conflict can be handled in either a constructive or destructive way”. Despite this recent conceptualisation of conflict, few studies are available in which the researchers have tried to distinguish between constructive

conflict and destructive conflict as well as their respective effects on organisational outcomes. Research studies have shown a negative association between “disharmony” and the quality of employee relationships and between “disharmony” and new product success in terms of innovation performance. Conversely, harmonious or cooperative relationships have been found to be associated with improved performance. Dyer and Song (1998) specifically modeled constructive conflict and found that it leads to innovation success. Menon and colleagues (1996) found indirect linkages between dysfunctional (destructive) conflict and market performance for new product introductions. Song, Dyer, & Thieme (2006) found a strong positive association between constructive conflict and innovation performance and a strong negative association between destructive conflict and innovation performance.

Guetzkow and Gyr (1954) suggested two dimensions of conflict in the organisational context – one consisting of disagreements relating to task issues and the other consisting of emotional or interpersonal issues which lead to conflict. These two dimensions of conflict have been given a variety of labels – e.g. substantive and affective conflicts (Guetzkow & Gyr, 1954), task and relationship conflicts (Pinkley, 1990; Jehn, 1997), cognitive and affective conflicts (Amason, 1996), and task and emotional conflicts (Ross, 1989). In recent years, several researchers have empirically

investigated these two dimensions of conflict. They suggest that the distinction between these two types of conflict is valid and that they have differential effects at the workplace.

It may be noted that affective conflict refers to inconsistency in interpersonal relationships which occurs when organisational members become aware that their feelings and emotions regarding some of the issues are incompatible. "Summarily stated, relationship conflicts interfere with task-related effort because members focus on reducing threats, increasing power, and attempting to build cohesion rather than working on task... The conflict causes members to be negative, irritable, suspicious, and resentful" (Jehn, 1997).

Research evidence has shown that affective conflict impedes group performance by limiting information – processing ability and cognitive functioning of group members and antagonistic attributions of group members' behaviour (Amason, 1996; Baron, 1997; Jehn, 1995; Jehn *et. al.*, 1999; Wall and Nolan, 1986). Affective conflicts are detrimental to the performance of the team as decisions are unlikely to be based on the merits of the case and backed by solid commitment for implementation (DeChurch, Hamilton, and Haas, 2007). Such conflicts could result in dysfunctional teams, and reduced performance and cohesion (Jehn and Chatman, 2000; Sullivan and Feltz, 2001; Wheaton, 1974). Affective conflicts

diminish group loyalty, workgroup commitment, intent to stay in the present organisation, and job satisfaction (Amason, 1996; Jehn, 1995, 1997; Jehn *et. al.*, 1999). These result from higher levels of stress and anxiety and conflict escalation.

Substantive conflict occurs when two or more organisational members disagree on their task or content issues. Substantive conflict is very similar to issue conflict which occurs when two or more social entities disagree on the recognition of and solution to a task problem. A study conducted by Jehn (1995) revealed that a moderate level of substantial conflict is beneficial as it stimulates discussion and debate which helps groups to attain higher levels of performance. As observed by Jehn (1997), "Groups with an absence of task conflict may miss new ways to enhance their performance while very high levels of task conflict may interfere with task completion".

Evidence indicates that substantive conflict is positively associated with beneficial outcomes in organisations. Groups that report substantive conflict are able to make better decisions than those that do not (Amason, 1996; Cosier & Rose, 1977; Fiol, 1994; Putnam, 1994, Schweiger, Sandberg, & Raga, 1986). Substantial conflict encourages greater understanding of the issues, which leads to better decisions. Such conflict promotes frank and open discussions potentially leading to innovative solutions, and also

reduces possibilities of complacency, status quo and tendency towards “group think” (Gero, 1985; Turner & Pratkanis, 1997). In addition, it has been noted that groups that report substantive conflict generally have higher performance levels. Substantial conflict can improve group performance through better understanding of various viewpoints and alternative solutions (Bourgeois, 1985; Eisenhardt & Schoonhoven, 1990; Jehn, 1995, 1997; Jehn *et. al.*, 1999). It should be noted, however, that the beneficial effects of substantial conflict on performance have been found only in groups performing non-routine tasks, but not in groups performing standardized or routine tasks.

### **Desirability of Conflict**

The human relations movement, with its emphasis upon the personal and organization costs of conflict, implied that conflict was to be avoided or eliminated (Kelly, 1970; Litterer, 1966). This traditional notion of conflict essentially resulted from the misconception that conflict is inherently distasteful, destructive and pathological to organisational objectives. Although Kahn *et.al.* (1964) considered some conflict as essential for the continued development of mature and competent human beings; they stated that “common reactions to conflict and its associated tensions are often dysfunctional for the organization as an ongoing social system and self-defeating for the person in the long run. Similarly, Boulding (1962) recognizes that some optimum level of

conflict and associated personal stress and tension are necessary for progress and productivity but he portrays conflict primarily as a personal and social cost. Even the more dispassionate theory of organization proposed by March & Simon (1958) defines conflict conceptually as a “breakdown in the standard mechanism of decision-making”, i.e. as a malfunction of the system.

Attitudes towards conflict appear to have changed over the years. A more balanced view of conflict has emerged in the literature, which recognizes its costs and benefits, its dangers and promises. More and more social scientists are coming to realize and to demonstrate that conflict by itself is no evil, but rather a phenomenon which can have constructive or destructive effects, depending upon its management. As stated by Thomas (1976), “with the recognition that conflict can be both useful and destructive, the emphasis has shifted from the elimination of conflict to the management of conflict”. Now there is a more general recognition that inter-personal and inter-group conflict, if managed properly, serves many useful functions in the organization (Coser, 1956; Blake & Mouton, 1964; Deutsch, 1971; Hoffman, Harburg, & Maier, 1962; Pondy, 1967, Thompson, 1960). These useful functions of conflict have been described by Thomas (1976) in a succinct manner, as given hereunder.

First, a moderate degree of conflict may not necessarily be viewed as a cost

by the parties involved. It is increasingly recognized that too little stimulation or tension may be as unpleasant to a person as an excess of it. Under conditions of low tension, people may welcome or seek out the novelty of divergent opinions, the challenge of competition, and at times, even the excitement of open hostilities. Deutsch (1971) mentions that conflicts stimulate interest and curiosity, and that “conflict is part of the process of testing and assessing oneself and as such, may be highly enjoyable as one experiences the full and active use of one’s capacities”.

Second, the confrontation of divergent views often produces ideas of superior quality (Pelz, 1956; Hoffman, 1959; Hoffman & Maier, 1961; Hall, 1971). Divergent views must be based upon different considerations, different insights and different frames of reference. Disagreements may thus lead an individual to take cognizance of factors which he had previously ignored, and help him to arrive at a more comprehensive and balanced view of things.

Third, aggressive behaviour in conflict situations is not necessarily irrational or destructive. Indeed, the aggressive pursuit of apparently conflicting goals by two parties may well lead to constructive outcomes. March & Simon (1958) and Litterer (1966) state that such conflict tends to initiate a search for ways of reducing the conflict. Since one party’s gains are not necessarily another party’s losses, the parties may succeed in finding

new arrangements which benefit them both (Follett, 1941) as well as the organization.

A few other useful side effects of conflict have also been noted by the social scientists. Litterer (1966) noted that conflict within an organization may call attention to systemic problems which require change. Hostility between groups also tends to foster internal cohesiveness and unity of purpose within groups (Coser, 1956; Blake & Mouton, 1961). Finally, power struggles often provide the mechanism for determining the balance of power, and thus adjusting the terms of a relationship according to these realities (Coser, 1956).

### **Management of Conflict**

It has been widely recongised that conflict by itself should not be regarded as a negative phenomenon within organisations. Rather, there is ample research evidence to show that conflict can have positive or negative effects within organisations depending upon its management. Here, it would be significant to note that studies on the management of organisational conflict have generally moved in two directions. Some researchers have attempted to measure the amount or intensity of conflict at various organisational levels in terms of stress, anxiety, hostility, tension, competition, etc., and also explore the sources of such conflict. The underlying implication of these studies is that a moderate amount of conflict may be maintained for enhancing organisational effectiveness by altering the

sources of conflict. As Brown (1983) has suggested, “conflict management can require intervention to reduce conflict if there is too much, or intervention to promote conflict if there is too little”. However, it should be pointed out that the relationship suggested by Brown as mentioned above, seems to be appropriate only for substantive, but not for affective conflict. As discussed previously, Guetzkow & Gyr (1954) have differentiated between substantive and affective conflict, and have suggested that substantial conflict consisting of disagreements relating to tasks, policies and other organisational issues is positively associated with beneficial outcomes in organisations. On the other hand, affective conflict consists of emotional or interpersonal issues, and it has been found to impede group performance as well as other measures of organisational effectiveness. Thus, while substantial conflict is to be maintained at an appropriate level within organisations, affective conflict should be discouraged as much as possible on account of its dysfunctional effects. The instrument developed by Jehn (1994) can be used to measure affective and substantive conflicts at the group level as well as at the interpersonal and intergroup levels.

The second approach to the management of conflicts has been used by researchers to relate various styles of handling interpersonal conflict and their effects on organisational objectives. In fact, a number of research studies have

been conducted on the relationship between styles of handling conflict and different dimensions or aspects of individual, interpersonal, interdepartmental or organisational effectiveness. At a conceptual level, Blake and Mouton (1964) suggested that individuals or organisations placing greater emphasis on confrontation or problem – solving behaviour would have effective interpersonal relations. In an empirical study, Lawrence & Lorsch (1967) examined the use of confrontation, forcing and smoothing in six organisations. Their research findings indicated that while confrontation or problem – solving behaviour seemed to be clearly related to organisational effectiveness, it was also noted that the absence of smoothing and the presence of forcing as a back – up mode (to confrontation) were related to effective organisational functioning. Another study conducted by Burke (1969) involved examining the five methods of resolving conflicts (as proposed by Blake and Mouton) in the context of superior – subordinate relations.

It was found that confrontation or problem – solving emerged as the most effective method of conflict resolution, and it was followed by smoothing behaviours. In addition, it was noted that withdrawing and forcing behaviours were negatively related to interpersonal effectiveness while compromising was not at all related to effectiveness. In the context of interdepartmental relations, Thomas (1971) found that managers’ satisfaction

with interdepartmental negotiations varied positively with confrontation and smoothing behaviour by their counterparts in other departments, and negatively with forcing and withdrawing. Another study conducted by Aram *et. al.* (1971) within research and development teams indicated that team collaboration was positively related to several measures of member self-actualization and well-being. By contrast, Dutton and Walton (1966) observed that managers involved in competitive inter-departmental relations experienced considerable frustration and anxiety.

It must be pointed out that the studies available on the relationship between conflict management strategies and organisational or individual effectiveness have been mostly conducted in American industrial settings, which may not be so pertinent to Indian industrial situations. In the Indian context, a case study conducted by Sharma and Samantara (1994) on the relative effectiveness of conflict resolution methods in terms of their effects on organisational effectiveness aspects (i.e. productivity, adaptability and flexibility) of a computer-manufacturing organisation revealed that confrontation or problem-solving was the most effective method of conflict resolution, and it was followed by smoothing behaviour. Although the compromising and withdrawing models were somewhat positively related to effectiveness, their effects seemed to be relatively insignificant. It was also noted that the forcing mode of resolving conflicts emerged as the ineffective one.

## Concluding Observations

In the preceding analysis, the contributions of leading theoreticians as well as researchers on the subject of organisational conflict have been put together in an integrated framework. In fact, the present research has been immensely revealing in that it focuses on certain fundamental issues related to organisational conflict such as its internal dynamics, its antecedent conditions, and the changing view of conflict and conflict management in recent times. It is hoped that the ideas and insights gained from this analysis will help the practicing managers to take a more pragmatic view of conflicts existing at various organisational levels and also seek to realize their potential benefits to the organization in terms of individual as well as group development, organisational innovation and creativity, higher performance levels, etc., through better management practices.

On the basis of our analysis of research studies conducted on the relationship between conflict management strategies and several aspects of organisational effectiveness, we can conclude that the problem-solving strategy or behaviour may be viewed as the most effective way of managing conflicts in organisations, and it may be supplemented by the use of smoothing behaviour. Thus, there is a need to encourage managers to enhance their utilization of these two conflict management strategies or methods, especially in the context of the emerging

scenario of increasing education, skills and horizon of understanding of industrial employees. However, the research findings have also amply demonstrated that forcing behaviours are rather counter-productive in the management of organisational conflicts. In view of the emergence of industrial democracy, the present-day managers can no longer afford to ignore the needs and aspirations of their subordinates, or ignore the latter's suggestions and viewpoints on a variety of organisational issues. In fact, the subordinate employees do have the necessary ability to understand and analyse the intricacies related to the work situation, and also get involved in organisational decision-making. Thus, the managers should make a reduction in their utilization of forcing behaviours in resolving or managing conflicts with their subordinates.

In the end, it must be pointed out that the above suggestions made regarding the relative efficacy or effectiveness of conflict management strategies may have immense practical relevance to industrial situations and conditions. However, still there is a paramount need to conduct comprehensive research studies across industries, especially in the Indian context, with a view to obtaining research findings that would have greater validity as well as general applicability to the Indian industrial environment. In addition, we should not be oblivious of the fact that there are also several situational variables such as employees' education and skills, their economic conditions, organisational

climate, social norms, etc. which do play a significant role in the choice of conflict management strategies as well as their attendant consequences on different aspects of organisational effectiveness. Therefore, the managers must try to understand and analyse the situational variables before choosing the appropriate style of conflict management to be used in a given situation. Although different notable contingency approaches to conflict management (Thomas, 1972, 1976; Derr, 1978; Pareek, 1982; Rahim, 1985; Rahim *et al.*, 2001; Rahim & Bonoma, 1979) have analysed different sets of situational variables affecting the choice of conflict management strategies as well as their potential outcomes or effects, there is a specific need to conduct empirical research studies regarding the efficacy or effectiveness of conflict management strategies in the context of various organisational as well as psycho-social variables.

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## Key Processes Adopted For Transportation Management System In Small Scale Firms

Vipul Chalotra

Assistant Professor, Dept. of Commerce  
University of Jammu, 182121, Udhampur campus  
vipulchalotra@gmail.com

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### ABSTRACT

*Transportation management system occupies an important place in the contemporary arena as it assists in the smooth, exact and qualitative movement of goods to the aspired destinations. The present research work highlights some of the key processes adopted for transportation management system in 44 small scale firms operating in District Udhampur of J&K State. The research framework was scrutinized by empirical analysis of first hand/primary data collected from the respective small scale firms managers. The variables taken into preview were "Planning & decision", "Transportation execution", "Measurement" and "Transportation follow-up". The results of the ranking table revealed that the variable "Planning & decision making" attained rank, "Transportation execution" attained rank second. Third rank is obtained by the variable "Measurement" and rank fourth was gained by the variable "Transportation follow-up". Further, the results of the linear hierarchal regression revealed that proper planning and decision making leads to effective transportation management system in small scale firms.*

**Key Words:** *Transportation Management System (TMS), Small Scale Firms, Transportation.*

### Introduction

Transportation today had made possible the existence of world markets in terms of globalisation, liberalisation. The market/marketing world exists because of transportation which further adds on by technically developing physical and electronic linkages. In present world the major costs contributing towards the price of the products are because of the packaging, warehousing, transportation

which amounts a lot in the overall costs. So transportation assists in transporting the raw materials etc to the place of production and even transporting the finished goods to the final consumption point which in lieu assists in exchange of goods and services of home and host countries.

A transportation management system (TMS) is basically a compartment of supply chain management that is entirely

concerned with effective transportation management and transport operations which in turn is effectual subset of an enterprise resource planning system. A TMS lies between the enterprise resource planning and the warehouse/distribution unit. An effective transportation management system offers effectual routing solutions with the optimal decisions regarding both procurement and shipping/transportation orders. These solutions offer best route/mode to be decided by the user with the least possible cost. Once the user selects the best provider, an electronic load tendering is generated in order to trace the track for executing the optimized transportation/shipment with the carrier selected and further to support settlement process. Effective transportation management systems manage four key processes of transportation management which were considered for the present research purpose also:

- **Planning and decision making** – Under this the transportation management system will provide the most efficient transportation schemes which will include low transportation cost, fewer stops in order to ensure quality, short lead-time, flows regrouping coefficient, etc.
- **Transportation Execution** – Under this the transportation management system will execute the transportation plan while taking into consideration few points such as carrier rate acceptance, chosen carrier availability, carrier dispatching, EDI etc.

- **Transport follow-up** – Under this the transportation management system will start following the transportation operation: tracing of transport event time to time (shipping from A, arrival at B, customs clearance, etc.), editing of reception, custom clearance, invoicing and booking documents, sending of transport alerts (delay, accident, non-forecast stops...)
- **Measurement** – Under this the transportation management system will prescribe a key performance indicator (KPI) which will report every function for transport like productivity in monetary terms, productivity in operational terms, e.g. shipping units/order or weight/load.

So, Transportation Management System (TMS) entirely focus on transport logistics which further facilitate connections between an Order Management System (OMS) and the Warehouse/ Distribution unit (DU). The various other functions which are performed by an effective transportation management system are: Planning and optimizing of terrestrial transport rounds, Inbound and outbound transportation mode, transportation provider selection, Arrangement of carrier i.e. rail, air and roadways etc, Real time transportation tracking, and vehicle load with Route optimization etc.

## LITERATURE REVIEW

The transportation management research framework was promoted in the after the mid-1980s where the firms

enhanced from the traditional transportation models to more sophisticated network approaches with the effectiveness in terms of cost i.e. cost effective movement of goods across space and time (Knowles, 1993 and Black, 2001 & 2003). A well reputed transportation management system had to abide by many rules, norms, standards so that goods could be effectively sent from the place of production to consumption which is considered as the right place in order to measure transportation effectiveness which in lieu is encompassed with timely satisfying customers' demands. The base of business efficiency and economy lies in the hands of transportation management system adopted by businesses which expands other functions of logistics also. An effective transportation management system even brings in business competitiveness (Giuliano and Narayan, 2003).

Effective transportation management system even pertains and includes all the functions and sub-functions into a system of shipment of goods effectively and safely to the requested destination which includes cost minimization, service maximisation to users and numerous other logistics benefits. The transportation management system, once put in practice or once executed, must be successfully managed (Ewing, et al., 2003). The present study takes into consideration the various key processes adopted by transportation management system in 44 small scale firms operating in District Udhampur of J&K State.

## **HYPOTHESIS FORMULATION**

The following was the main hypothesis of the study:

*Hyp1: Proper planning and decision making leads to effective transportation management system in small scale firms.*

*Obj1: The objective is to analyse that whether proper planning and decisions assists in formulating and developing effective transportation management system in small scale firms..*

## **RESEARCH DESIGN AND METHODOLOGY**

The research methodology adopted for the study is as follows:

### **Sampling and data collection**

The sample for the study was chosen from the small scale firms operating in District Udhampur of Jammu & Kashmir State. There were registered firms under the DIC (District Industries Centre) Udhampur that were found operating under this pursuit. This area was chosen for research because of the research scarcity in this area. Proper and first hand information were collected from these 44 small scale units. There were total of 49 registered units under DIC out of which five of these were found non functional due to one reason or other. The 44 small manufacturing units were further categorised into similar ten lines of operations which is mentioned as: cement (8), pesticide (3), steel (3), battery/lead/

alloy (5), menthol (2), guns (2), conduit pipes (2), gates/grills/varnish (5), maize/atta/dal mills (3) and miscellaneous (11). The miscellaneous (not falling in any category) category embraced 11 small scale units namely M/s Supertech Industry, M/s Luxmi Electronics Works, Shaj Nath Vanaspati Ltd., M/s Aditiya Cables, Poles and Transformers, Shankar Lime Industry, M/s Unique Carbon Industries, M/s B.S Traders, M/s Vijay Candles, Everest Health Care Products, M/s J.K Petro Chemicals, M/s Ajay Ice Factory. The primary data from these small scale 44 units were collected with the help of census method.

### **Research instrument**

Research instrument stands for data construction form. For the present study the research instrument was self developed with the assistance of existing literature and its content validity was checked by consulting the same with proficient academicians, industrialists, surveyors, research scholars. The research instrument contained questions regarding the general information of the respondents and some of transportation management system. The data collection form which is named as questionnaire comprised of ranking questions, dichotomous questions and five-point Likert scale, where 1 stands for strongly disagree and 5 for strongly agree. Here in this study, ranking tables and linear regression were used in order to make the study elaborative for drawing meaningful inferences.

### **Data collection**

The data for the present research were collected with the assistance of self developed research instrument namely questionnaire. The first hand information basically known as primary information were collected with the help of the developed instrument. The response was collected from the small scale firms' managers who stood as respondents of the research. The response was gathered taking into preview the time feasibility of the respondents and duly approaching them for the research purpose. All ethical considerations were followed while collecting response from respective respondents. The data was collected through census method. The secondary source of data was also taken into consideration and reliable information was collected by different sources: internet, books and empirical papers from referred journals. In the present study only and only Ranking tables were used for eliciting consequential inferences.

### **DATA ANALYSIS AND RESULTS INTERPRETATION**

The data so collected from small scale firms' managers were portrayed in tabular form to make it more meaningful and understandable. Table 1 lays out the mean ranking of factors laying down the key processes adopted for transportation management system in these small scale operational units functioning in District Udhampur of J&K State. In District Udhampur, under DIC (District Industries

Centre) segregated into two main categories namely SIDCO & SICOP, there are 44 small manufacturing firms operating which had been mainly classified into ten lines of operations i.e. the small scale manufacturing units having analogous types of businesses are categorised into homogeneous headings namely cement (8), pesticide (3), steel (3), battery/lead/alloy (5), menthol (2), guns (2), conduit pipes (2), gates/grills/varnish (5), maize/atta/dal mills (3) and miscellaneous (11). The factors that were enlisted in order to track down the key processes adopted for transportation management system in these firms are “Planning & decision”, “Transportation execution”, “Measurement” and “Transportation follow-up”. Overall, the variable “Planning & decision making” attained rank one

among all the variables as this rank is accorded by almost all managers of these small scale registered firms. “Transportation execution” attained rank second. Third rank is obtained by the variable “Measurement” and rank fourth was gained by the variable “Transportation follow-up”. Overall mean response to the factors in descending order are 2.1 (Planning & decision making), 2.2 (Transportation execution), 2.5 (Measurement) and 2.9 (Transportation follow-up) respectively. The variables connoted that the processes so adopted by small scale firms justifiable for transportation management system. The following figure represents the various variables that determine the key processes for effective transportation management system:

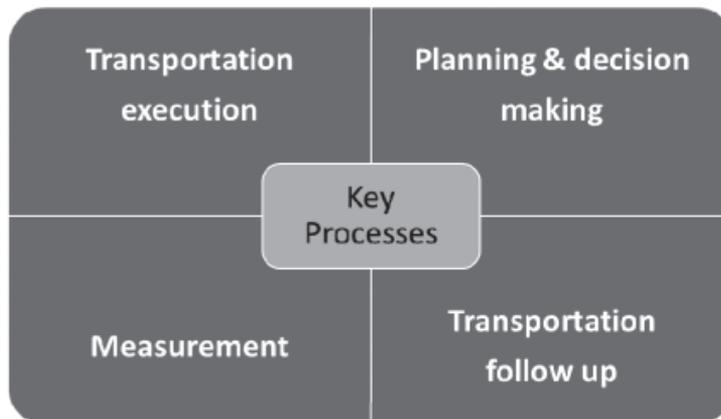


Figure showing the key processes with its various factors.

The ranking of the key processes adopted for transportation management system in small scale firms is done as follows:

### Cements

The cements sector among the 44 small scale firms is the largest sector with eight prominent small scale firms named

M/s Associated Cements, Zenith Cement Industry, Shivalik Cements, M/s Continental Cement Industry, Wullar Cements, M/s Shri Nath Industry and Uma Cement Industry being found enlisted as small scale firms. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned: these small scale firms accorded rank one to “Transportation execution” as it acted as the main factor for transportation management. “Planning & decision making” was accorded rank two by almost all the small scale units as accrued to be the second important factor to be considered if transportation management needs to be effective. “Measurement” was given rank three by these small scale cements firms and “Transportation follow-up” was positioned with rank four. Thus the ranking made by these firms ensured that “Transportation execution” is the prominent factor as it acted as the main/key process for effective transportation management.

### **Battery/ Lead/ Alloy**

The second category of the industry is given the name Battery/Lead/Alloy because of the similar or allied products produced and sold by this category of firms. The total number of units under this category was five and they were respectively named as Radha Industries, Pilot Batteries, Durga Batteries, Suraksha Batteries and Avtar Batteries. The mean ranking approved by these small competent units firms was: “Measurement” was given rank one by all the small scale

firms operating as it stood as the main factor that make transportation management effective. “Transportation execution” was accorded rank two amongst all the variables. The variable “Transportation follow-up” was endorsed rank three as it was that factor which determines transportation efficiency of the small firms. Accordingly, “Planning & decision making” awakened with rank four as represented in the table 1.

### **Pesticides / Insecticides**

The third main category encircling small scale firms is Pesticides/Insecticides. The three main well known market oriented firms operating under this category were: M/s Dhanuva Agritech Ltd., Safex Chemicals Ltd. and M/s Modern Insecticides. The mean ranking rendered by these small scale industries managers in respect of the key process adopted for effective transportation management in these small scale units is that these small scale firms fixed rank one to “Transportation execution” as it divulges that it determines the transportation effectiveness other areas also. Rank two was accorded to the factor “Planning & decision making” as it stood as the second main factor that assists in making transportation strategies effective in nature. Rank three was followed by the variable “Transportation follow-up” as it gives some glimpses of transportation effectiveness. The last and the fourth rank is devoted to “Measurement” which could be their last reason for adopting transportation processes.

### **Conduit pipes**

M/s Pee Kay Products and Rukhmani plastics were the two small scale competitive units under this category. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, the variable “Planning & decision making” attained rank one amongst all the prominent factors under this group periphery. “Transportation execution” applauded with rank two and was given due recognition by conduit pipes. “Measurement” was allotted rank three. “Transportation follow-up” was agreed at rank four. The mean rankings of the variables ensured that these small scale operating units puts emphasis on Planning & decision making as to be main variable that seems to be the first step in deciding transportation management.

### **Menthol**

The menthol group comprised of M/s Harikripa Perfumes Pvt. Ltd. and M/s Mahadurga which were again quite competent small scale units. The ranking related to the process adopted for effective transportation management of these small units is as follows: “Transportation follow-up” was given rank one, “Measurement” emanated with rank two, “Transportation execution” was given rank three, and “Planning & decision making” was accorded rank four.

### **Guns**

This category comprised of only two competitors namely M/s Gulab Gun Factory and M/s Hunter Gun factory. The two units were in use of effective transportation medium. Both of them dispensed rank one to “Transportation follow-up” followed by “Planning & decision making” with rank two. “Transportation execution” was bestowed with rank three by both the units and “Measurement” was consigned rank four. The ranking is displayed in table 1.

### **Steel**

M/s Maha Luxmi Steel Fabricators, M/s Faqir Chand Sanak Raj and M/s Gupta Furniture were the three small scale competing units operating under this Industrial category. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, the variable “Planning & decision making” was assigned rank one as it was declared to be first step in order to decide for effective transportation management. “Transportation execution” ranked two, “Measurement” ranked three and “Transportation follow-up” ranked four respectively.

### **Gates/ Grills/ Varnish/ Paint**

This group was found to be the advanced group and is the main group of the research. M/s Balaji Industries, M/s Wazir Engineering Works, ISRO Products, Shakti Engineering Works and

M/s Everest Paints were found operating under this category. As far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, rank one by this group of small scale firms was devoted to "Planning & decision making". "Measurement" was given rank two by these units, "Transportation execution" was fixed with rank three, and "Transportation follow-up" was aligned rank four respectively (Table 1).

#### **Atta/ Maize/ Dal mills**

Shalimar Floor Mills, M/s Udhampur Dal Mills and M/s Sharda Enterprises were the three strong competitors operating under this esteemed category. So far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, "Planning & decision making" was consigned rank one by all the three strong competitors operating under the category. "Transportation execution" was elected for rank two by these small industrial units. "Measurement" was accorded rank three. "Transportation follow-up" was mentored rank four. It implies that atta/maize/dal mills small scale firms mainly concentrated on Planning & decision making for effective determination of transportation management processes as depicted in table 1.

#### **Others (Miscellaneous)**

There were eleven small scale competitive units operating under this miscellaneous category. The names of the

units that were operating under this group were M/s Supertech Industry, M/s Luxmi Electronics Works, Shaj Nath Vanaspati Ltd., M/s Aditiya Cables, M/s Unique Carbon Industries, M/s B.S Traders, Poles and Transformers, M/s Vijay Candles, Everest Health Care Products, Shankar Lime Industry, M/s J.K Petro Chemicals and M/s Ajay Ice Factory. So far as mean ranking associated with the key processes adopted for transportation management system in these small scale firms is concerned, "Planning & decision making" was accorded rank one by most of the small scale units and "Measurement" was given rank two by almost all the small scale units operating, "Transportation execution" was appropriated rank three and "Transportation follow-up" was consigned rank four representing the actual figure of variables that enlists the key processes adopted for transportation management.

Overall, all the small scale firms operating under SIDCO & SICOP represents Planning & decision making as the key process for effective transportation management, followed by Transportation execution, subsequently after that Measurement and at the end by Transportation follow-up (Table 1).

#### **Regression analysis**

In order to test the research hypothesis, regression analysis was conducted for measuring the impact of proper planning and decision making on transportation management system. The linear regression model summary table

(Table 2) enticed with the value of R to be .780 which assures 78% alliance between dependent variable and the independent variable i.e. between proper planning and decision making on transportation management system,  $R^2$  value of .700 denotes that 70% of variation in transportation management system could be explained from the independent variable (proper planning and decision making). Adjusted  $R^2$  value .609 connotes the increase in the value of  $R^2$ , if anytime another independent variable is added to the existing independent variable. Further beta value reveals significant relationship of independent variable with dependent variable as depicted by its value. Change in R square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis ***“Proper planning and decision making leads to effective transportation management system in small scale firms”*** is accepted as represented by its significance level  $p < .05$ .

## CONCLUSION

Transportation is considered as of vital importance as it assists in developing diverse markets, reduces remoteness among different countries and augments International trade. It assists in the proper distribution of wealth. The transport network routes are essential in a country as it assists in the economic progress. The present research connotes the mean ranking associated with the key processes adopted for transportation management

system in the small scale. The study takes into consideration some variables/factors which are quite appealing and praiseworthy as portrayed in the existing literature. The variable taken for the present study in order to identify the key processes adopted for transportation management system are: “Planning & decision making”, “Transportation execution”, “Measurement” and “Transportation follow-up”.

The present research conducted on the small scale 44 firms divulges the mean ranks accorded to these four variables by the managers of these small scale firms. The ranking were related to the key processes that were adopted by these small scale firms regarding effective transportation system. Overall, the variable “Planning & decision making” is assigned rank one by almost all managers of small manufacturing firms. “Transportation execution” attained rank second. Third rank is acquired by “Measurement” and rank four was stood by “Transportation follow-up”.

Overall mean response to the factors in descending order are 2.1 (Planning & decision making), 2.2 (Transportation execution), 2.5 (Measurement) and 2.9 (Transportation follow-up) respectively. Further linear regression model summary results exposed that proper planning and decision making leads to effective transportation management system in small scale firms as contoured by the respective significant values.

### Limitations of the study

The study is conducted in one area i.e. area specific, so the results of this study cannot have universal application as there could be diversity in other areas according to the environment and other factors associated.

The results depend upon the response of the respective respondents. Anyhow all the efforts were applied to make the study free from any sort of biasness but the rule of subjectivity cannot be avoided.

### Future research

Similar type of research could be conducted in large scale firms. Future research can also be conducted by taking into preview more than four factors that assists in mentoring the key processes adopted for effective transportation management system. Moreover, the similar study could be considered for medium and large scale units operating in the other parts of the country.

**Table 1:** Key Processes Adopted For Transportation Management System in Small Scale Firms

Units/Factors	Transportation execution	Planning & decision making	Measurement	Transportation follow up
Cement	2 (I)	2.2 (II)	2.3 (III)	3.2 (IV)
Battery/Lead/Alloy	2.6 (II)	3 (IV)	1.8 (I)	2.7 (III)
Pesticides/Insecticides	1 (I)	2.3 (II)	3 (IV)	2.6 (III)
Conduit pipes	2 (II)	1 (I)	3 (III)	4 (IV)
Menthol	3 (III)	4 (IV)	2 (II)	1 (I)
Guns	2.5 (III)	2.5 (II)	3 (IV)	2 (I)
Steel	2.6 (II)	1 (I)	2.6 (III)	4 (IV)
Gates/Grills/Varnish/Paint	2.6 (III)	2.2 (I)	2.4 (II)	2.8 (IV)
Atta/Maize/Dal mills	2 (II)	1 (I)	3.3 (III)	3.6 (IV)
Others (Miscellaneous)	2.5 (III)	1.9 (I)	2 (II)	3.2 (IV)
Mean & Rank	2.2 (II)	2.1 (I)	2.5 (III)	2.9 (IV)

**Note:** Where 1 denotes “highest rank” and 4 denotes “lowest rank”

**Table 2:** Regression Model Summary

Model	R	R <sup>2</sup>	AdjustedR <sup>2</sup>	Std. Error of Estimate	F value ANOVA	Sig. level	β	t	Sig. level
1.	.780	.700	.609	.2001	42.546	.000	.758	9.524	.011

a. Predictors: (Constant), Proper planning and decision making

b. Dependent Variable: Effective Transportation Management System

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## KIIT School of Management, KIIT University

Campus-7, Bhubaneswar-751024, Odisha, India

Tel: 0674 – 6012504, Tel (Fax): 0674 – 2725 278

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