

# DIAS Technology Review

## The International Journal for Business & IT

Vol. 11 No. 1

#21

www.dias.ac.in



APRIL 2014 – SEPTEMBER 2014

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## DIAS Technology Review The International Journal for Business & IT

Listed In

10<sup>th</sup> Edition of  
**CABELL'S DIRECTORY, U.S.A.**

&



**SOCIAL SCIENCE RESEARCH NETWORK**

Accessible at : [www.ssrn.com](http://www.ssrn.com)



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*Printed, Published and Edited by Shri Sanjay Sachdeva, on behalf of Delhi Institute of Advanced Studies, Plot No.6, Sector-25, Rohini, Delhi-110085 and Printed at Swan Press, B-71, Naraina Industrial Area, Phase-II, New Delhi-110028.*

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Neetu Chadha, Sakshi Saxena

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#### 38 Correlates of Technology Orientation, Social Media Usage and Ethical Disposition of Generation Y Employees in Delhi NCR

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### CASE STUDIES

#### 48 Emerging Trends in System Software Market: A Case Study of Operating System Software

Basanna S Patagundi, Suneel Maheshwari & Uday Tate

This paper captures the latest trend in operating system software market as it analyses customers' preference to switch over from the current operating system on desktops, laptops and workstations to either open source or hardware integrated operating system except servers.

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Ritu Bajaj

# From The Editor's Desk

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It is our profound delight to present our readers the twenty first issue of DIAS Technology Review.

The economic and financial landscape of borderless global economy today is interspersed with harmonized practices policies and corporate governance rules facilitating cross border linkages and capital flows between the countries. The international regulatory policies are further intensifying stock markets' complexity and sensitivity. In the article **“Co-Movements of and Linkages between National Stock Exchange and New York Stock Exchange”** the authors have tried to delve into the dynamics of stock markets' synchronization by using Johnsen co-integration, Granger's causality and Garch model. This empirical study has explored various perspectives on co-integration between NSE and NYSE to find that these move in tandem with each other.

The whirlwind of changing technology has revolutionized the banking and finance sector as well. Information technology has not only heightened the efficiency in banks' internal processes, but has also made delivery of e-banking services more flexible and customer centric. The article **“Influence of E-delivery Channels on Productivity of Commercial Banks in India”** discusses momentous impact of electronic banking on employee productivity and branch productivity. The authors have construed that computerization in banks has perked up both credit and profit per branch which has given a boost into customer relationship management as well.

Pyramid structures of successful organizations are set up and managed by a steadfast work force. Job satisfaction is the most propelling power behind creativity, productivity and efficiency of employees in an organization. The strategists in organizations, mull over the relationship between job performance and job satisfaction, while devising futuristic action plan for human resource. In the article **“The Impact of Job Satisfaction on Job Performance of Employees in Haryana Roadways”** the authors have pondered over various extrinsic and intrinsic rewards for Haryana roadways employees for making an effective strategy to abet their performance.

The veritable war of talent and soaring expectations of customers are compelling firms to achieve efficiency in production and quality. In the article **“Improving Productivity Using Lean Six Sigma”** the authors have intertwined common threads to six sigma and lean technology which help in eliminating waste, reducing variations and enhancing product quality in modern organizations. The article **“Correlates of Technology Orientation, Social Media Usage and Ethical Disposition of Generation Y Employees in Delhi NCR”** also dissects the practice and impact of social media technology on work ethics of eco boomers, the tech savvy millennial work force. This intensely networked youth of today may pose problem to business agility or leakage of crucial information due to overindulgence in social media.

The progression in information technology earmarks a shift in customer preferences in system software market as well. In **“Emerging Trends in System Software Market: A case Study of Operating System Software”**, the authors have captured a leaning trend towards open source or hardware integrated operating system over proprietary operating soft ware indicating the changing market structure. Similarly in the case study **“Is Xiaomi a Game-changer”** the strategic jigsaw, which made the company 'numero-uno' in China's smart phone market, has been scrutinized by the author.

In our endeavor of accumulation and proliferation of knowledge in different areas of business and IT, we are incorporating two case studies and one abstract of doctoral dissertation along with latest studies of prominent research scholars across the globe.

We believe that the present edition of this journal will come up to the expectations of our revered readers.



Regards,

Handwritten signature of Dr. Anju Batra in blue ink.

Dr. Anju Batra

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# Co-Movements of and Linkages Between National Stock Exchange (NSE) and New York Stock Exchange (NYSE)

Neetu Chadha<sup>1</sup>, Sakshi Saxena<sup>2</sup>

## ABSTRACT

*The financial markets have now become more closely interlinked in the world over than ever before despite the differences in risk perceptions of the markets or the country profiles. The dynamics of cross-country trade and payments have evolved to such an extent that the economic slowdown of a country is bound to affect its trading partners as is clearly discernable from the leading movement in the global stock prices. In the current context of globalization and the subsequent integration of the global markets, this study captures the trends, similarities and patterns in the activities and movements of the National Stock Exchange of India (NSE) in comparison to the New York Stock Exchange (NYSE). The prime objective of the study is to check the long term association and cause & effect relationship between the indices of Indian stock market and New York Stock Exchange. Johansen's co-integration test and Granger Wald Causality test are used for examining the long term relationship between both the stock markets, and to know the cause and effect relationship between the variables selected. The GARCH (1,1) model has been used to capture the main characteristics of financial time series such as stationarity, fat-tails, and volatility clustering. The paper tests the correlation between the two exchanges to prove that the Indian markets have become more integrated with their global counterparts and their reactions are in tandem with what are seen globally.*

**Keywords:** Correlation, GARCH, Granger Wald Causality, Johansen's co-integration, NSE, NYSE, Risk, Return, Stock Market.



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## INTRODUCTION

As the world is undergoing the rapid process of globalization, international trade in both goods and financial assets, has expanded tremendously. Fast developments in information technology and means of communication have greatly facilitated the international transmission of information, dissemination of knowledge and diffusion of technology. The financial markets are characterized by dramatic evolution, with liberalization of financial transactions, removal of restrictions on cross-border capital flows, development of new financial products, as well as harmonization of practices, policies, regulations and corporate governance rules. Most importantly, the stock markets get the major impact of such happenings.

The movement towards a synchronized stock market landscape has gained momentum, especially during the past two decades, where tighter economical and financial linkages among developed economies have grown stronger. However, the rise of many important emerging markets, which had been a major driver of global growth in the past decades, had opened up additional channels for cross-border relations. Other causes behind the rapid increase in world trade, capital movements and foreign investments between world economies are market deregulation, technological advances and removal of statutory controls. Many of these factors have contributed to more interlinked economies, which in turn, are said to have given rise to a higher degree of stock market synchronization, especially in volatile time periods, like eruption of a financial crisis, war or political instability. The aftermath of historical financial crises, have opened up a tremendous interest for determining the underlying factors that might explain how stock markets are correlated with one another for better understanding the causes of the sudden and simultaneous deterioration of wealth that occur during period of crisis. The extent of financial and economic integration between a country-pair may indeed be reflected by the degree of stock markets co-movements that they exhibit. In fact, the dynamic structures of international economies have clearly intensified the complexity behind stock market performances. As our countries become more economically interlinked, explaining the formation of price co-movement between stock markets on an international level is significant for better understanding this higher interdependency and integration.

Stock markets have been the area of interest for the researchers for many years. The Indian stock exchanges hold a place of prominence not only in Asia but also at the global stage. The Bombay Stock Exchange (BSE) is one of the oldest exchanges across the world, while the National Stock Exchange (NSE) is among the best in terms of sophistication and advancement of technology. The Indian stock market scene really picked up after the opening up of the economy in the early nineties. This opening up of the system led to increased integration with heightened cross border flow of capital, with India emerging as an investment 'hotspot' resulting in our stock exchanges being impacted by global cues like never before.

Numbers of researches have been carried out in the field of integration of stock markets across the world. But the impact and degree of integration is changing and expanding continuously with the emerging reforms, integration of countries through various agreements such as BRICS, NAFTA, SAFTA etc. and the introduction of new and more effective and efficient technologies in this field. Since, the stock markets across the world show some kind of correlated movements and it has been observed that developed nations' disturbances have a significant impact on the stock exchanges of the developing nations' stock exchanges and vice-versa so it seems to be important to calculate the impact of the developed country's stock exchange on the stock exchanges of developing nation's stock exchanges and vice-versa. It would be interesting to see whether the stock markets of the developing nations impact the stock markets of developed nations or not, and if they have an impact then the degree would play a crucial role in judging the movement.

It has always been observed that even our Indian stock market is deeply influenced by the major developed markets across the world and especially by the US markets. The present study attempts to investigate these linkages between NYSE and NSE.



## LITERATURE REVIEW

Emerging stock markets' integration has naturally constituted a privileged field for international financial research. Markets are said to be integrated if they share a common trend, that is to say, if they move together. There have been numerous studies on market integration and interdependence. However, the literature review shows that there is conflicting evidence on the issue of international stock market linkages.

Chan, Benton and Min (1997) conducted a study on integration of stock markets by including 18 nations covering a 32 year period. These markets were analyzed both separately and collectively in regions to test for the weak form market efficiency. The cross country market efficiency is tested by using Johansen's co-integration test. The results proved that only small number of stock markets shown evidence of co-integration with others.

Bala and Mukund (2001) in their study examined the nature and extent of linkage between the US and the Indian stock markets. They used the theory of co-integration to study the interdependence between the Bombay stock exchange (BSE), the NYSE and NASDAQ. The data consisted of daily closing prices for the three indices from January 1991 through December 1999. The results investigated that the Indian stock market was not affected by the movements in US markets for the entire sample period.

Aqil Mohd. Hadi Hassan (2003) used multivariate co-integration techniques developed by Johansen (1988, 1991, 1992b) and Johansen and Juselius (1990) to test for the existence of long-term relationships between share prices in the Gulf region. Using a vector-error correction model, they investigated the short-term dynamics of prices by testing for

the existence and direction of inter-temporal Granger-causality. Result shows that share prices in Kuwait and Bahrain are co-integrated with one co-integrating vector, which means the existence of a stable, meaningful long-term relationship between share prices in these two countries. They also investigated the inter-temporal interactions among share prices in three Gulf Co-operation (GCC) countries' stock markets, namely Kuwait, Bahrain and Oman.

Lim et al. (2003) examined the linkages between stock markets in the Asian region over the period 1988-2002 using non-parametric co-integration techniques and they found that there is a common force which brings these markets together in the long run.

Wing Keun Wong et al (2004) investigated the relationship between the major developed markets of United States, United Kingdom and Japan with the emerging markets of Malaysia, Thailand, Korea, Taiwan, Singapore and Hong Kong, and found that Singapore and Taiwan are co-integrating with Japan while Hong Kong is co-integrating with the United States and the United Kingdom. There are no long run equilibrium relationship between Malaysia, Thailand and Korea and the developed markets of the United States, the United Kingdom and Japan. The relationship between the developed and emerging markets also change over time

Wing-Keung Wong, Aman Agarwal, Jun Du (2005) investigated the long run equilibrium relationship and short run dynamic inter linkages between the Indian stock market and world major developed stock market by using the weekly data of BSE 200 (India), S&P 500 (US), FTSE 100 (UK) and Nikkei 225 (Japan) from January 1991 to December 2003. Results show that Indian stock market is integrated with mature markets and sensitive to the dynamics in these markets in the long run. In short run, both US and Japan, Granger causes the Indian stock market but not vice versa. In addition, they found that the Indian stock index and the mature stock indices form fractionally co-integrated relationship in the long run with a common fractional, non stationary component and find that the Johansen method is the best to reveal their co-integration relationship

Debjiban Mukherjee, (2007) in his study has covered New York Stock exchange (NYSE), Hong Kong Stock exchange (HSE), Tokyo Stock exchange (TSE), Russian Stock exchange (RSE), Korean Stock exchange (KSE) from various socio-political-economic backgrounds. Both the Bombay Stock exchange (BSE) and the National Stock Exchange of Indian Limited (NSE) have been used in the study as a part of Indian stock Market. The time period has been divided into various eras to test the correlation between the various exchanges to prove that the Indian markets have become more integrated with their global counterparts.

Mazharul H. Kazi (2008) examined whether the Australian stock market is integrated to the equity markets of its major trading partners under the influence of globalization. They used the co-integration technique of Johansen (1996, 2000) to ascertain whether the Australian stock market is interrelated

with the UK, USA, Canada, German, French and the Japanese stock markets. Essentially, the long-run relationship among selected markets is investigated using annual data for the period 1945 to 2002. The result indicates that although selected markets are integrated yet not all are significant enough. The significant overseas markets for Australia are the UK, Canada and German of which the UK is dominating.

Arshad Hasan et al (2008) examined the long term relationship between Karachi stock exchange and equity markets of developed world for the period 2000 to 2006 by using multivariate Co-integration analysis. Johansen and Juselius multivariate Co-integration analysis indicates that markets are integrated and there exists a long term relationship between these markets. However, pair wise Co-integration analysis shows that Karachi stock market is not co-integrated with equity market of US, UK, Germany, Canada, Italy and Australia. However, Karachi stock exchange is found to be integrated with France and Japan.

Janak Raj and Sarat Dhal (2009) investigated the nature of the financial integration of India's stock market with global and major regional markets. Co-integration relation suggests that the Indian market's dependence on global markets, such as the United States and the United Kingdom, is substantially higher than on regional markets such as Singapore and Hong Kong. VECM result shows that international market developments at regional and global levels together could account for the bulk of the total variation in the Indian stock market. Within Asia, the Singapore and Hong Kong markets have significant influence, while the Japanese market has weak influence on the Indian market. The two influential global markets, the United States and the United Kingdom, could have a differential impact on the Indian market in the opposite direction, amid a structural shift in India's integration with these global markets.

Fredj Jawadi et al. (2009) studied the financial integration between the six main Latin American markets and the US market in a nonlinear framework process Co-integration techniques suggested partial time-varying financial integration of Mexico and Chile into the US market. For Brazil, the integration process seems to follow a linear pattern, while they found no long-term relationships between the other Latin markets and the US market. The dynamics of these markets depend simultaneously on local and global risk factors.

Mohamed El Hedi Aroui & Fredj Jawadi (2010) investigated the stock market integration hypothesis of two emerging countries (the Philippines and Mexico) into the world capital market over three decades. To check this hypothesis in the short and long run, they used the nonlinear co-integration techniques. The result shows that both stock markets are nonlinearly integrated into the world market, although the degree of integration is higher for Mexico. Furthermore, they showed that the stock market integration process is nonlinear, asymmetric and time-varying.

Ilhan Meric, Joe H Kim (2012) extensively examined the co-

movements of and the linkages between the U.S. stock market and Asian stock markets. They used principal components analysis (PCA) and Granger-Causality (G-C) statistical techniques. They found that the contemporaneous co-movements of Asian stock markets have become closer and portfolio diversification benefits with Asian stock markets have diminished over time during the January 1, 2001-January 1, 2011 period. They examined that the Singapore, Indian and Japanese stock markets are the most influential stock markets and the Philippine and South Korean stock markets are the least influential stock markets in Asia. The Japanese, Singapore and New Zealand stock markets are least affected stock markets while the movements in the other Asian stock markets and the Shanghai, Australian, and South Korean stock markets are the most affected stock markets.

Aman Srivastava et al (2012) studied the short and long-term relationships in three Asian markets, namely Hongkong, Singapore and Japan along with four other global markets of the USA, UK, Germany and France, perceived to be driving Indian Stock prices. By using co-integration techniques they found that Indian stock markets are very much integrated with other global markets in short run but less integrated in long run.



**OBJECTIVES OF THE STUDY**

The specific objectives of this present study are as follows:

- o To investigate the long term relationship between NSE and NYSE.
- o To examine the cause and effect relationship between NSE and NYSE.
- o To measure the magnitude of volatility between NSE and NYSE.

**Hypotheses**

The following hypotheses have been formulated:

H0: There is no long term relationship between NSE and NYSE.

H0: There is no significant cause and effect relationship between NSE and NYSE.

H0: NSE and NYSE are not volatile.

**Variable and data**

The study analyses the relationship between Indian stock market and US stock market. The stock indices used for the study are the most important national benchmark indices for the respective country; the NYSE as an indicator for US and NSE as an indicator for the Indian stock prices. A description of the indices analysed here is presented in table 1. The daily data series from 1st April 2004 to 31st March 2013 is taken for study. Data is collected from official websites of National Stock Exchange and New York Stock Exchange. The data has

**Table 1: Description of the Indices Analyzed**

Country	Stock Market	Index	Code used in Study
India	NSE	CNX Nifty	NSE_Return
USA	NYSE	NYSE Composite	NYSE_Return

Choice of market is guided by the consideration that India has significant trade and financial relations with US.



**ETHODOLOGY**

This paper employed the Johansen Co-integration test to determine whether selected US stock markets is co-integrated with share prices in the Indian stock exchange or not. The Augmented Dickey- Fuller (ADF) approach is used to pre-test the order of integration for all time series variables. A visual inspection of the time series plots of the variables investigated suggests that there are no significant break points during the sample period.

Then Co-integration testis used to check whether India and US countries co-integrate in the long run and whether they converge to each other in the short run. Since, the objective of this study is to check the co-integration of the movements of these indices, so natural logarithm of the empirical tests for co-integration can only proceed if the time series are non-stationary. In this analysis, series of indices have been tested for unit root properties using Augmented Dickey Fuller (ADF) Test. For this, the null hypothesis of a single root is tested against the alternative of stationary using the model stated in equation 1.

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \gamma \Delta Y_{t-1} + e_t \tag{1}$$

The co-integration analysis technique is still evolving and has many forms, as is evident from the literature. Often the terms, casuality and co-integration are synonymous. To examine the co-movements between the Indian stock market and US stock market, first of all relationship is studied with the simple regression equation.

$$X_t^I = a + bX_t^k + e_t \tag{2}$$

Where the endogenous variable  $X_t^I$  represents the Indian stock index, the exogenous variable  $X_t^k$  is the US stock index and  $e_t$  error term. This is very useful when to test and incorporate both the economic theory relating to the long-run relationship between variables and short run disequilibrium behaviours.

$$\Delta y_t = \alpha_1 + \beta_1 [\Delta y]_{t-1} + \gamma_1 x_{t-1} + \theta(y_t - \lambda x_{t-1})_{t-1} + e_t \tag{3}$$

The short-run relationship is captured by the lagged terms of the  $\Delta x$  variable, the current impact of x to y is captured by the  $\beta_0$  coefficient, while the long-run disequilibrium deviations are captured by the one period lagged error-term of the co integrating equation, with  $\theta$  being the adjustment factor to equilibrium.  $\theta$ , of course takes values between 0 to 1, while it is obvious that closest to one, the largest is the adjustment to

equilibrium and vice versa.

**Maximum Eigen Value Test**

The Eigen values are the squared canonical correlation between a linear combination of stationary and linear combination between non-stationary. This interpretation is intuitively appealing because this correlation will be high only if the linear combination of  $\lambda$  is itself stationary. Otherwise, a non-stationary variable cannot have a high correlation with a stationary variable. Therefore, higher the Eigen value, higher will be the stationarity of the particular linear combination of the non-stationary variable. Only those Eigen values indicate the co-integrating relationship among the variables which are significantly different from zero. The corresponding (normalized to a variable) Eigen vector of an Eigen value is the potential co-integrating vector. However, this vector represents a co-integrating relationship only if its Eigen value is different from zero. Once the co-integrating vector (in the form of eigenvector) is known, the error-correction vector can easily be estimated using its OLS estimator.

**Trace Test**

Maximum likelihood estimator gives us  $k$  number of Eigen-values, but all of them will not be significantly different from zero. Let us assume only  $r$  Eigen values are different from zero. Now there are following possibilities:

$r = 0$ , it means there is no co-integrating relationship among the variables. Therefore, the VAR should be estimated without error correction term.

$r = k$ , this can happen only when  $X_t$  is stationary rather than non-stationary.

$r < k$ , then there are only  $r$  co-integrating relationship among the variables. This is the most obvious situation and in this case only  $r$  Eigen values are different from zero and remaining  $(k-r)$  Eigen values are non-distinguishable from zero.

Johansen suggests trace test (ML based test) to determine the number of non-zero Eigen values.

Trace test examines the null hypothesis that the co-integration rank is equal to  $r$  against the alternative hypothesis that co-integration rank is  $k$ . The test is conducted in inverse sequence, i.e.,. The test statistic is computed as follows:

$$(4)$$

Although both of these statistics are based on likelihood ratio approach, these do not follow the standard-distribution. Rather they have non-standard distribution.

Before implementing Johansen's test, we have to take two important decisions: (i) what should be the order of the VAR i.e. 'p', and (ii) should we include deterministic parameters with or without imposing co-integration restrictions.

**Granger Causality Test**

A statistical approach proposed by Clive W Granger (1969) to assess whether there is any potential predictability power of one indicator for the other (Foresti, 2007). A time series is said to Granger Cause other if the past values of the former improve

the forecast of the latter (Enders, 2008). A Granger causality test is used for testing the causal relationship between two stationary series  $X_t$  and  $Y_t$  in the following two equations: +

Where  $\alpha, \beta, \delta, \phi, \gamma$ , 's are constants and  $m$  is the optimal lag length and are assumed to be white noise i.e., disturbance terms with zero mean and finite variance.

Granger causality test seeks to answer whether changes in  $Y_t$  cause changes in  $X_t$ . If  $X_t$  causes  $Y_t$ , lags of the former should be significant in the equation for the latter i.e.,  $\beta \neq 0$ . If this is the case and not vice-versa (i.e.,  $\alpha = 0$ ) it would be said that  $Y_t$  Granger causes  $X_t$  or that there exists uni-directional causality from  $Y_t$  to  $X_t$ . On the other hand, if  $X_t$  causes  $Y_t$ , lags of  $X_t$  should be significant in the equation for  $Y_t$ . If both sets of lags are significant, it would be said that there exists 'bi-directional causality' or 'bi-directional feedback'. Also, if there exists uni-directional Granger causality from  $Y_t$  to  $X_t$ , then  $Y_t$  is said to be strongly exogenous in the equation of  $X_t$ . If neither set of lags are statistically significant in the equation for the other variable, then it is said to be independent of each other. Granger causality really means only a correlation between the current value of one variable and the past values of other. It does not mean that movements of one variable cause movements of another.

**GARCH Model**

The GARCH (1, 1) model is also used to capture the main characteristics of financial time series such as stationarity, fat-tails, and volatility clustering. As per GARCH (1, 1) model, the presence of persistence in volatility clustering implies inefficiency of the capital market in India.

The basic GARCH (1, 1) model can be expressed as:

Mean Equation:  $R_t = \mu + e_t$

Variance Equation:  $\sigma_t^2 = \omega + \alpha e_{t-1}^2 + \beta \sigma_{t-1}^2$

Where  $e_{t-1}^2$  is the news about volatility from the previous period and  $\sigma_{t-1}^2$  is the last period forecast variance.

being close to one shows high persistence in volatility clustering and implies inefficiency of the market.



**EMPIRICAL ANALYSIS**

Table 2 shows statistical moments of daily stock returns. For the sample period (April 2004-March 2013), the study found that Indian stock market provided highest stock returns. In terms of risk adjusted return (average stock adjusted to standard deviation), the Indian stock market provided highest returns with higher standard deviation. Skewness and kurtosis measures provide insights about the underlying statistical distribution of stock returns. It is evident that skewness is negative and kurtosis is positive for both the markets during the sample period. Skewness and kurtosis exhibit more or less a similar pattern of statistical distribution. The Jarque-Bera statistic, defined over skewness and kurtosis measures, is very high for both the markets, implying that stock returns differ significantly from the normal distribution. This implies that in each stock market there are opportunities for investors to benefit from abnormal returns.

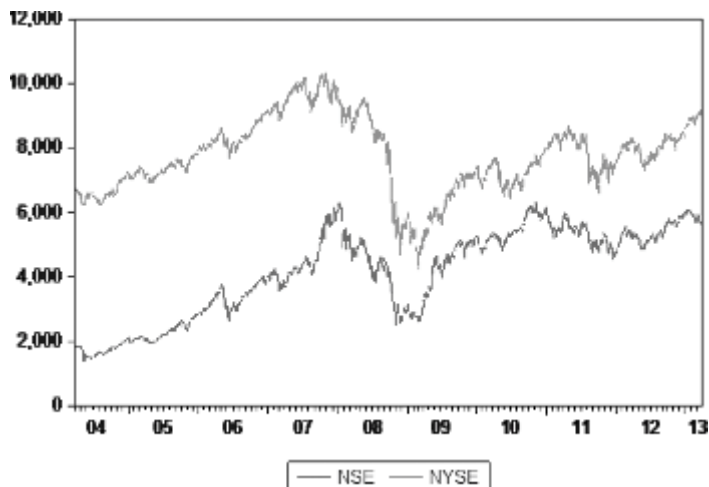
**Table 2: Descriptive Statistics of Stock Return (April 2004- March 2013)**

	NSE_Return	NYSE_Return
Mean	0.000526	0.000146
Median	0.001093	0.000757
Maximum	0.163343	0.115258
Minimum	-0.152303	-0.102321
Std. Dev.	0.017153	0.014443
Skewness	-0.483249	-0.366921
Kurtosis	14.12960	13.66803
Jarque-Bera	11247.79	10305.38

**Table 3: Correlation of Stock Markets**

	NSE_Return	NYSE_Return
NSE_Return	1.000000	0.330630
NYSE_Return	0.330630	1.000000

It is evident from the table 3 that Indian stock market showed lesser but positive co-movement with the global stock markets of the United States



**Figure 1: Stock Prices of NSE and NYSE**

Both the indices are moving in tandem i.e. correlation is existing between the two indices(as quoted by table 3).Figure 1 shows the co-movement of India's stock prices with US stock market. The X-axis depicts the time frame in years and the Y-axis depicts closing prices of stock markets. Graph shows similar trend for both the markets because of their interdependence on each other, and this can be attributed to various reasons like the high dependence of the American economy on the Indian economy as far as human resources, both skilled and unskilled are concerned. There is high degree of inflow of capital to India in the form of FII, FDI and jobs as well.

The sharp dip seen in the year 2009 is due to the deepening of the crisis, when many well established financial institutions (like Lehman brothers) could not sustain the crisis and collapsed leaving the finances of the world devastated. The market sentiments were highly negative during this time frame and investors' confidence in the markets had received a direct blow.

Again, both indices are moving in absolute harmony with each other. The primary trend is almost a parallel one. The shocker that came with the subprime crisis is seen to take a back seat, giving way to opening up of the trade channels between the US and India. This is the reason why the indices are seen to improve in values, though stagnant graphs highlight the slow recovery after the depression caused by the subprime crisis..

Thus, it can be deduced that there is a positive correlation among the two indices (and hence between the respective exchanges that they are representing) and they move together irrespective of the market condition. This is proved further with the analysis of the kind of relationship between these two indices considered for the study.

**ADF Test Results**

While testing for the stationarity of series using ADF test, the hypothesis is:

H0: Presence of unit root i.e., non-stationary series.

H1: No unit roots i.e., stationary series.

The critical values of the ADF at 1%, 5% and 10% levels are tabulated in Table 4.

**Table 4: Critical Values**

	1%	5%	10%
Critical Values	-3.433072	-2.862628	-2.567395

The logarithm returns of all the selected index series are tested for stationarity at various levels. The results for the same are reported in table 5.

**Table 5: Results of Stationarity at First Difference (Intercept)**

	Values
D(NSE_Return)	-44.73250
D(NYSE_Return)	-51.41097

Comparing table 4 and 5 shows that the calculated ADF test statistics is less than the critical value, so the null hypothesis of presence of one unit root is rejected. This implies that the series becomes stationary at first difference. Or, it can be said that the ADF test confirms the stationarity of returns of stock exchanges.

Now, since the index returns of both the stock markets are stationary, they can be used to carry out further analysis.

**Johansen's Co-integration Test Results**

Before testing for co-integration, it is necessary to determine the optimal lag length. The available literature suggests that optimal lag length for studies trying to prove co-integration between stock markets can be considered as one. Accordingly, the study has taken the lag length as one in the model for analysis.

**Co-integration Test**

The test requires maximization of Eigen value and trace test which will determine the number of co-integrating equations. The hypothesis used for the test is:

H0: There is no long run relationship between returns of Nifty

and returns of NYSE.

The analysis is done for the defined period and results are reported in table 6.

**Table 6: Unrestricted Co-integration Rank Test**

PERIODS	NUMBER OF HYPOTHESISED EQUATIONS	MAXIMUM EIGEN STATISTICS	TRACE STATISTICS	P-VALUE
1-04-2004 to 31-03-2013	None	499.8993	908.5862	0.0001
	At most 1	408.6870	408.6870	0.0000

As can be seen in the table 6, for the sample period both maximum Eigen statistics and trace statistics have p-value less than 0.05, so the null hypothesis that there is no long run relationship between Nifty index return series and NYSE Composite stock indices return series in logarithm is rejected, i.e., there exists a long-run relationship between the two return series. For the null hypothesis that there exists at most one co-integration equation between the two return series, both the maximum Eigen statistics and trace statistics have p-value less than 0.05. Hence, null hypothesis is rejected. So, finally we conclude that there exists a long-run relationship between NSE and NYSE returns.

**Granger Causality Test Results**

The pre-requisite for Granger Causality test is that the analysis is done on the stationary series. The hypothesis formulated is as under:

H0: Movement in returns of Nifty does not Granger cause movement in returns of NYSE Composite.

**Table 7: Granger Causality Results**

Null Hypothesis	F-Statistic	Prob.
NYSE_RETURN does not Granger Cause NSE_RETURN	68.8991	1.E-29
NSE_RETURN does not Granger Cause NYSE_RETURN	1.25609	0.2850

To examine the short-run dynamics of the series, a Granger Causality test was performed. The results, which are summarized in Table 7, suggest that the both countries are significantly related in the short-run. NSE stock market is affected by US stock market i.e NYSE. Results indicate a unidirectional Granger Causality from NYSE to NSE.

**GARCH (1,1) MODEL**

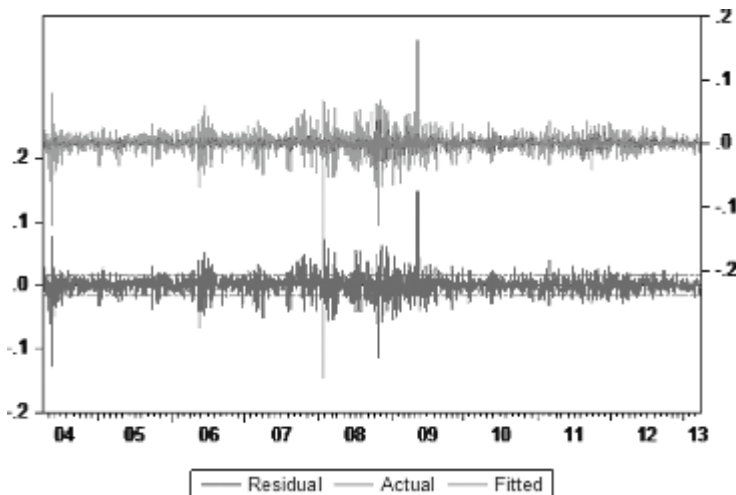


Fig. 2 plots the daily return residual and it is very apparent from this that the amplitude of the daily stock returns is changing. The magnitude of the changes is sometimes large and sometimes small. It can be seen that periods of low volatility tend to be followed by periods of low volatility for a prolonged period and periods of high volatility is followed by periods of high volatility for a prolonged period. This is the effect that GARCH is designed to measure and is known as volatility clustering.

**Table 8: Garch (1, 1) Estimates of Data**

Variables	Coefficient	Z-Statistics	P-value
$\omega$	4.77E-06	5.375939	0.0000
$\alpha$	0.141195	9.63944	0.0000
$\beta$	0.849440	96.97795	0.0000

The reported results in the table 8 show that the value of  $(\alpha+\beta)$  is very close to 1 for all capital markets, suggesting thereby a high persistence of volatility clusters over the sample period in the markets. Such high persistence of volatility clusters during the sample period in emerging as well as developed capital markets may be due to the most recent global financial recession, and underlying credit and confident crises.



**CONCLUSION**

The present study examined the impact of global integration on Indian stock markets. The empirical analysis provides various perspectives on co-integration among global stock markets, examining daily time series for a period April 2004 – March 2013 when global markets have gone through financial sufferings by using Johansen co-integration, Granger Casuality and GARCH(1,1) model. Both markets have been exhibiting tighter co-movements with one another, and that they are more integrated due to closer financial and economical linkages. Correlation result suggests that Indian stock market showed positive co-movement with the global stock markets of the United States. The Jarque-Bera statistic, defined over skewness and kurtosis measures, is very high for both the markets, implying that stock returns follow random walk over the period of study. ADF test confirms the stationarity of returns of stock exchanges. Granger Causality test results indicate a unidirectional Granger Causality from NYSE to NSE. This proves short run relationship between NSE and NYSE. Johansen's Co-integration Test proved long-run relationship between NSE and NYSE returns. GARCH model indicates high persistence of volatility clusters among both the markets. Results provide supportive evidence of increased stock market integration both short term and long term linkages. In spite of some disturbances, the result shows that both the markets have relatively similar movements during the period of study. The present paper has made it clear that the two exchanges under study move more or less in tandem with each other. Important global happenings are seen to affect both the exchanges in a similar fashion. NYSE is a mature and the most stable stock exchange of US. NSE seems to have followed or moved in tandem with the NYSE. It actually matches the level of a well established benchmark, NYSE. Now, the volatility of NSE is almost at par with the NYSE. A greater degree of co-movements in stock prices is seen as a reflection of greater stock market integration.

The findings of this research are very important for policy makers, investors and fund managers. Policy makers, investors and fund managers should closely watch any sharp movement in the global markets which are influential for Indian stock markets. From the policy perspective, if markets are co-integrated then this implies financial stability and

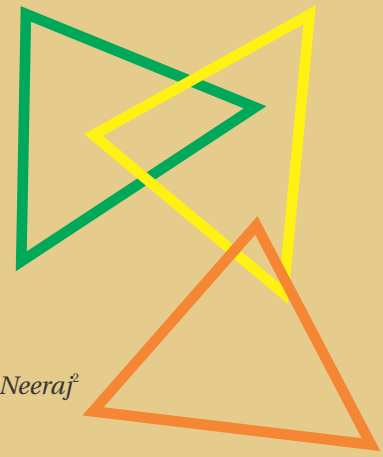
prices cannot deviate too far from the long-run equilibrium path. Investors cannot benefit from arbitrage activities in the long run. But in short run, markets would continue to be influenced by the portfolio diversification objective of foreign investors.

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# Influence of E-delivery Channels on Productivity of Commercial Banks in India

Dr. B.S. Bodla<sup>1</sup>, Ms. Neeraj<sup>2</sup>



## ABSTRACT

Technological progress in the banking industry is important because of the key roles of banks in providing financing, deposits and payment services to other sectors of the economy. So, This paper brings out the impact of use of e-delivery channels on the employee productivity and branch productivity of commercial banks in India. The commercial banks are divided into five broad groups- Foreign banks, Nationalized banks, New Private banks, Old Private banks, SBI and its Associates. For the purpose of this study six productivity ratios have been taken for a five year duration ranging from 2007-08 to 2011-12. Regression analysis has been made to bring out the impact of e-delivery channels on productivity performance. SPSS (version 19) is applied for statistical data analysis. The findings indicated that the productivity has positive relationship with the use of ATMs and Credit cards.

**Key Terms:** E-Delivery Channels, Branch Productivity, Employee productivity, Debit Cards, and Credit Cards

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## INTRODUCTION

Indian banking industry has now entered to the technology based customer-centric and competitive banking from the earlier social banking era. The use of technologies such as automated teller machines, phones, the internet, credit cards, and electronic cash have transformed the way banks deliver their services. Jalan, B. (2003), expressed that perhaps no other sector has been affected by advances in technology as much as banking and finance. Shetty, V.P. (2000) states that technology is dramatically altering the ways in which financial services are delivered to consumers. In line with global trends, electronic banking in India has been undergoing many changes. Banks in India have used IT not only to improve their own internal processes but also to increase facilities and services to the customer. Apart from reducing transactions costs, the use of technology has also provided new avenues to banks to expand their outreach, especially in the remote and rural areas. The development of E-Banking has an enormous effect on development of more flexible payment methods and more user friendly banking services. In recent years, the use of electronic payments has witnessed manifold increase, partly reflecting increased adoption of technology. The ultimate aim of using e-delivery channels include ensuring increase in productivity and efficiency of banks through customer satisfaction, improvement in internal operations and employee empowerment. The majority of the banks in India have started using e-delivery channels since the beginning of twenty first century. Hence, it is high time to investigate the influence of IT on productivity of Indian's banking sector.

One of the most frequently used tools for performance analysis is productivity ratios. Productivity helps firms, industries and nations to achieve sustainable competitive advantage. Every firm is concerned with its productivity and there are various factors which affect the productivity of various players in the banking field. So, in order to have a reliable idea of productivity, it is necessary to study the relationship of those factors with bank productivity.

The profitability and employee productivity are two categories of performance indicators of a bank. The financial performance is measured by profitability indicators and the employee productivity measures non financial performance. Employee productivity refers to per employee deposits, credits and business etc. Every employee and every branch of a bank contributes to its total productivity. Branch productivity means proportionate production of the banks per branch in terms of deposits, credits, business, total income etc. Hence, the management and evaluation of the branch productivity and employee productivity is an imperative for taking policy decisions in banks.



## REVIEW OF LITERATURE

Recently several researchers, bankers, and policy makers have either conducted studies or written conceptual articles on the topic 'impact of computerization and IT' on the efficiency, productivity, customer satisfaction etc. in Indian banking industry. In this part of the paper some of the more frequently quoted studies have been reviewed.

Kamesam (2001) studied the changes that took place in the Indian banking industry which emphasized on technological advancements and profitability in banks. This study highlights that emergence of services such as electronic data interchange (EDI), usage of smart cards, RTGS, e-commerce etc. have resulted in increasing the level of profitability and productivity of banks. The author concluded that in order to reduce crimes, security audit should be done which will be helpful in improving customer service, increase systematic efficiency and thus increased productivity and profitability. DD Krishnamoorthy, Deputy General Manager, information technology, Bank of India (2002) says that the primary reason preventing PSU banks from introducing online banking services, has been the absence of a legal framework to back up, and regulate Internet banking operations in the country. Though the Information Technology Act, 2000 attempted to address a number of e-commerce regulatory issues, he feels that there are still grey areas which have neither been spelt out properly nor have the courts suggested workable modes of implementation. Janki, B. (2002) analyzed the effect of technology on the productivity of employees. The author found that there is utmost need in public sector banks to use technology to improve operating efficiency and customer services.

Mittal and Dhingra (2007) used Data Envelopment Analysis (DEA) to study the impact of computerization on profitability and productivity of banks in India. The study found that IT investment is one of the factors which lead to improved performance of banks. Shabbar Jaffry, et al. (2007) study is aimed to measure changes in productivity and technical efficiency levels within banking sectors of the Indian sub-continent: specifically India, Pakistan and Bangladesh, over the period 1993–2001. It was found that India and Bangladesh experienced immediate and sustained growth in technical efficiency, whereas Pakistan endured a reduction in efficiency during the middle years of the study, before rebounding to levels comparable to the rest of the sub-continent in the latter years of the study. Uppal, R.K. and Kaur, R. (2007), studied the status of IT in Indian banking sector. The authors mentioned that IT revolution has changed the way banking business is done in India. Hugar S.S. and Vaz N.H. (2008) evaluated the customer orientation in 5 public sector, 3 new private sector and 3 foreign banks. The study concludes that new private sector banks have more ATMs, at the end of March 2006, followed by SBI group. Business per employee and profits per employee are higher in foreign banks than SBI.

Pooja Malhotra and Balwinder Singh (2009) present the current state of internet banking in India. The results show that nearly 57 percent of the banks provide internet banking services. The multiple regression results reveal that the profitability and offering of Internet banking do not have any significant association. Paper of Uppal (2011) exhibits the growth of information technology in various bank groups. The maximum technology is taking place in new generation private sector banks as well as foreign banks. Public sector banks have more on site ATMs where as new private sector banks and foreign banks have more off site ATMs. The paper also suggested some strategies to enhance e delivery channels in banks particularly in public sector banks. The main objective of Paul and Trehan (2011) study was to analyze the impact of technology on bank customers using e-delivery

channels. This paper takes into account all the technological initiatives by banks as part of their channel diversification strategy. The results show that public sector banks have the least average increase of customers as compared to other bank groups. The employee, branch and total productivity index has shown an increase in all bank groups.

Paper by Dhiraj Sharma (2012), attempts to study financial performance of banks by classifying them on the basis of usage of Technology. The study brought out that the performance of most of the banks has improved significantly since the adoption of technology. Kaur (2012) paper analyzes the impact of IT on branch productivity of partially and fully IT-oriented banks. The correlation was calculated from the mentioned ratios of selected factors drawn from IBA and RBI reports' data. It concludes that IT along with other factors, have improved the productivity at an excellent rate and fully IT-oriented banks are the most beneficiaries. Natarajan and Duraisamy (2012) has highlighted the level of awareness of the customers regarding the various e-banking products and services. The study found that the profitability performance of banks is determined by non-interest income positively whereas NPA's have negative effect on it.

*The review of literature indicates that the issue of impact of IT on performance of banking have attracted the attention of numerous scholars and bankers since the beginning of 21st century. However, there are some gaps in the existing studies. For instance, there is a negligible research work which focuses on the relationship between usage of e-delivery channels (such as numbers of debit cards and credit card). Also majority of the previous studies are either conceptual or opinionistic survey about the use of technology in banking operations. In view of the above, there was an urgent need of a study which could bring out the influence of the usage of e-delivery channels on the efficiency and performance of the varied groups of commercial banks in India. The present study which aims to bring out the influence of e-delivery channels on the productivity of commercial banks in India is a well thought and timely initiative in this direction.*



**RESEARCH OBJECTIVE AND HYPOTHESIS**

The objective of the present research paper is to analyze the impact of e-delivery channels on productivity of various banks in India. The Study has also brought out the present e-banking scenario of ATMs, Internet banking, Mobile banking and Credit cards in India. To achieve the objectives of the study, the following hypothesis is formulated

H<sub>0</sub>: There is no significant relationship between the magnitude of E-delivery channels and the level of productivity of various bank groups' i.e. foreign banks, nationalized banks, new private sector banks, old private sector banks and SBI and its associates.



**RESEARCH METHODOLOGY**

The present study is descriptive in nature. The reference period of the study is 5 years from 2007-08 to 2011-12. It compares the productivity performance of the various bank

sector banks. Thus, it reveals the bank group-wise productivity in place of bank wise. The secondary data is taken as input to achieve the objectives of the study, For this study secondary data has been procured from:(i) Performance highlights, various issues, IBA (Mumbai), (ii) IBA Bulletin (Special Issues), 2007-08 to 2011-12; (iii) Report on Trend and Progress of Banking in India, 2007 to 2013; (iv) Statistical Tables Relating to Banks in India (RBI).

The data have been analyzed through descriptive and inferential statistical techniques such as mean, R, adjusted R<sup>2</sup>, F-test and multiple regressions. The problem of multi-collinearity is examined by Durbin Watson test. Excel spreadsheet and spss software (version 19) are used for statistical analysis. To remove the multicollinearity problem, if any, in the data the step wise method of regression has been used. The analysis is in conformity with the objective of study and the hypothesis formulated. The following productivity indicators are used to measure labor/employee productivity and branch productivity:

Deposit per employee	(D/E)	Deposit per branch	(D/BR)
Credit per employee	(CR/E)	Credit per branch	(CR/BR)
Profit per employee	(TP/E)	Profit per branch	(TP/BR)

The following multiple regression equation has been used to examine the impact of e-delivery channels on the productivity of Indian banks.

$$Y_c = a + b_1 * X_1 + b_2 * X_2 + b_3 * X_3 + b_4 * X_4 + e$$

Where Y<sub>c</sub> = Estimated value of dependent variable, bi's are regression coefficients for various independent variables. X<sub>1</sub> to X<sub>4</sub> are the observed values of the independent variables. In the above mentioned model different regression equations were fit by taking various measures of productivity as the dependent variable. The independent variables under study include: percent of ATMs to branches, per cent of off-site ATMs to total ATMs, number of outstanding credit cards and debit cards issued by a particular bank group during 2007-08 to 2011-12. The error term(e) in model is assumed as zero.

**Status of E-delivery Channels in Indian Banking Industry**

The process of computerisation, which was the starting point of all technological initiatives, is reaching near completion for most of the banks. Public sector banks continue to spend large amounts on computerisation and development of communication networks. Table 1 indicates that the proportion of public sector bank branches which achieved full computerization increased from 71 per cent as at end-March 2005 to 97.8 per cent as at end-March 2010 and the process of computerization is almost on the completion stage as more number of banks have moved into the 'more than 90 per cent but less than 100 per cent' category.

**Table 1: Computerization in Public Sector Banks (percentage to total branches)**

Category	2005	2006	2007	2008	2009	2010
Partially Computerized Branches	21.8	18.2	13.4	6.3	5	2.2
Fully Computerized (i+ii) Branches	71	77.5	85.6	93.7	95	97.8
(i) Branches Under Core Banking Solution	11	28.9	44.4	67	79	90
(ii) Branches already Fully Computerized	60	48.5	41.2	26.6	15.6	7.8

Source: Report on Trend and Progress of Banking in India 2010-11 RBI, Mumbai

Table 2: Bank group wise no. of Branches and ATMs of Scheduled Commercial Banks in India

Year	Bank Group	Total Branches	ATMs		Total ATMs	Percent of Onsite ATMs to Total ATMs	Percent of Offsite ATMs to Total ATMs	Percent of ATMs to Total Branches
			Onsite	Offsite				
(March end 2012)	All Scheduled Commercial Banks	81,24	47,545	48,141	95,686	49.7	50.3	117.8
	Nationalized Banks	48,636	18,277	12,773	31,050	58.9	41.1	63.8
	State Bank Group	18,830	15,735	11,408	27,143	58.0	42	144.1
	Old Private Sector Banks	5386	3342	2429	5771	57.9	42.1	107.1
	New Private Sector Banks	8,066	9,907	20,401	30,308	32.7	67.3	375.8
	Foreign banks	322	284	1130	1414	20.1	79.9	439.1
(March end 2011)	All Scheduled Commercial Banks	74,130	40,729	33,776	74,505	54.7	45.3	100.5
	Nationalized Banks	44,298	15,691	9,145	24,836	63.2	36.8	56.1
	State Bank Group	17,913	14,104	10,547	24,651	57.2	42.8	137.6
	Old Private Sector Banks	4,817	2641	1,485	4,126	64.0	36	85.7
	New Private Sector Banks	6,785	8007	11518	19525	41.0	59	287.8
	Foreign banks	317	286	1021	1367	20.9	79.1	431.2
(March end 2010)	All Scheduled Commercial Banks	69,160	32,679	27,474	60,153	54.3	45.7	87
	Nationalized Banks	41,596	12,655	7,047	19,702	64.2	35.8	47.4
	State Bank Group	17,229	11,142	9,836	20,978	53.1	46.9	121.8
	Old Private Sector Banks	4,952	2,266	1,124	3,390	66.8	33.2	68.5
	New Private Sector Banks	5,075	6,337	8,720	15,057	42.1	57.9	296.7
	Foreign banks	308	279	747	1026	27.2	72.8	333.1
(March end 2009)	All Scheduled Commercial Banks	64,608	24,645	19,006	43,651	56.5	43.5	67.6
	Nationalized Banks	39,376	9,861	5,177	15,038	65.6	34.4	38.2
	State Bank Group	16,062	7,146	4,193	11,339	63.0	37	70.6
	Old Private Sector Banks	4,673	1,830	844	2,674	68.4	31.6	57.2
	New Private Sector Banks	4,204	5,166	7,480	12,646	40.9	59.1	300.8
	Foreign banks	293	270	784	1054	25.6	74.4	359.7
(March end 2008)	All Scheduled Commercial Banks	61,132	18,486	16,303	34,789	53.1	46.9	56.9
	Nationalized Banks	37,775	8,320	5,035	13,355	62.3	37.7	35.4
	State Bank Group	15,105	4,582	3,851	8,433	54.3	45.7	55.8
	Old Private Sector Banks	4,450	1,436	664	2,100	68.4	31.6	47.2
	New Private Sector Banks	3,525	3,879	5,988	9,867	39.3	60.7	279.9
	Foreign banks	277	269	765	1034	26.0	74	373.2
(March end 2007)	All Scheduled Commercial Banks	57,042	14,796	12,292	27,088	54.6	45.4	47.5
	Nationalized Banks	35,636	6,634	3,254	9,888	67.1	32.9	27.7
	State Bank Group	14,030	3,655	2,786	6,441	56.7	43.3	45.9
	Old Private Sector Banks	4,606	1,104	503	1,607	68.7	31.3	34.9
	New Private Sector Banks	2,497	3,154	5,038	8,192	38.5	61.5	328.1
	Foreign banks	273	249	711	960	25.9	74.1	351.6

ATMs are becoming more popular in this world of technology among all the bank groups. It is a tremendous achievement of all bank groups that number of ATMs has increased in all bank groups during e-banking period. Table 2 indicates the total number of ATMs and percentage of ATMs to total branches. The total numbers of ATMs installed by the scheduled commercial banks rose to 95,686 at end-March 2012 from 27,088 at end-March 2007.

The ATMs installed by new private sector banks and foreign banks were more than 3 times of their respective branches during 2008-09. The total numbers of ATMs installed by them were 9,152 and 10,901 in the year 2007 and 2008 respectively where as old private sector banks had 1607 and 2100 ATMs in the corresponding duration. The number of ATMs of public

sector banks at the end of March 2007 and 2008 was 16,329 and 21,788 respectively. The private sector banks have 36,079 ATMs as on 31st march 2012 which is more than four times to that of 2007. Similarly the numbers of ATMs of public sector banks rise to 58,193 on 31st march 2012 from 16,329 in 2007.

The new private sector banks have the largest share in off-site ATMs, while nationalised banks have the largest share in on-site ATMs. During 2008-09, the maximum average of ATMs as a percentage of total branches has been observed in foreign bank groups, i.e. 357.3 percent, as compared to other bank groups. The percentage of off-site ATMs to total ATMs witnessed a marginal decline to 45.3 percent in 2009-10. Over the years the percentage of off-site ATMs to total ATMs has come very close to that of on-site ATMs. While, the ATMs

installed by new private sector banks and foreign banks were more than 3 times of their respective branches, the ATM to branch ratio was relatively lower for other bank groups. More than 65 per cent of the total ATMs belonged to the public sector banks as at ends March 2011. During 2011-12, an additional 21,000 ATMs were deployed by the banks. Public sector banks accounted for more than 60 per cent of the total number of ATMs as at end-March 2012, while close to one-third of the total ATMs were attributable to new private sector banks. The percentage of ATMs to total number of branches of scheduled commercial banks has risen to 117.8 percent in 2012 from 100.5 percent in 2011 and 47.5 percent in 2007. The foreign banks have an edge over domestic private sector as well as public sector banks in terms of the ratio of their ATMs to their branches. During 2012, this ratio stood at 439.1 percent in foreign banks, 375.8 percent in new private banks

and 86.3 percent in public sector banks. Nationalized banks have the lowest percentage of ATMs to branches (i.e. 63.8%) followed in, upside, by old private sector banks (i.e. 107.1%) and by State Bank of India group (i.e. 144.1%), in 2012. Overall the growth in ATMs has been excellent in recent years.

In India, the use of electronic payments has witnessed manifold increase, partly reflecting increased adoption of technology. Table 3 discerns that transactions such as Electronic Clearing Service (ECS) credit and debit, National Electronic Fund Transfer (NEFT) (both retail and card-based) increased by 41 per cent during 2007-08 as compared to 32.9 per cent in the previous year. It was mainly due to the refund of the oversubscription amount of IPOs floated by companies using electronic mode as mandated by the stock exchange.

**Table 3: Volume and Growth in Transactions through Retail Electronic Payment Methods**

Type	Growth in volume (%)						Growth in value					
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2006-07	2007-08	2008-2009	2009-10	2010-11	2011-12
ECS-Credit	56.1	13.5	12.8	11.0	19.5	3.6	157.6	839.3	-87.5	20.6	54.5	1.2
ECS-Debit	109.1	69	25.9	-6.7	5.0	5.1	95.9	92.3	36.9	3.8	5.9	13.3
EFT-NEFT	55.7	178.8	141.5	106.3	99.5	70.9	26.4	81.2	79.6	62.5	127.6	92.1
Credit Cards	8.6	34.6	13.7	-	13.2	20.7	22.1	40.2	12.7	-	22.2	27.9
Debit Cards	31.7	46.7	44.6	-	39.3	38.2	38.6	53.2	48.1	-	46.6	38.0

However, the growth in volume of transaction through electronic method declined to 24.8 percent in 2008-09. The decline in value of ECS credit transactions during 2008-09 may be interpreted more as returning to normal trend rather than a matter of concern. In 2010-11, the electronic payment systems for retail transactions registered a steep growth over the previous year but in 2011-12 it showed down trend in value of transactions through electronic payment method. The growth remained impressive during 2010-11 (127.6%) and 2011-12 (92.1%).

It is evident from the table 4 that outstanding number of debit cards of scheduled commercial banks has risen to 227.84 million in 2012 from 102.44 million in 2007. During 2007-08, SBI and its associates have the highest (36.04 millions) and foreign banks have the lowest (4.02 millions) number of debit cards. The outstanding number of debit cards issued by public sector bank was 91.7 million and 129 in the year 2008 and 2009 respectively where as other banks had 45.73 million and 52.23 million outstanding debit cards in the corresponding duration. The share of public sector banks and private sector banks in outstanding debit cards witnessed an increase during the year 2010-11, while that of foreign banks witnessed a decline in the same year. At the end of March 2012, more than three-fourth of the outstanding numbers of debit cards were issued by public sector banks. It is noteworthy that the outstanding number of credit cards for all scheduled commercial banks has decreased from 27.55 million in 2007 to 17.65 million during 2012. New private sector banks have issued the highest (13.25 millions) number of outstanding credit cards followed by foreign banks (10.33 million) during 2007-08.

**Table 4: Bank Group-wise Outstanding Number of Debit Card and Credit Card Issued by Scheduled Commercial Banks (in millions)**

Bank group	Outstanding no. of debit cards					Outstanding no. of credit cards				
	2007-08	2008-09	2009-10	2010-11	2011-12	2007-08	2008-2009	2009-10	2010-11	2011-12
<b>Public sector banks (i)</b>	<b>64.33</b>	<b>91.7</b>	<b>129.69</b>	<b>170.34</b>	<b>215</b>	<b>3.93</b>	<b>3.44</b>	<b>3.26</b>	<b>3.08</b>	<b>3.06</b>
Nationalized banks	28.29	40.71	58.82	80.27	103	0.72	0.72	0.73	0.78	0.84
SBI group	36.04	50.99	70.87	90.07	112	3.21	2.72	2.53	2.3	2.22
<b>Private sector banks (ii)</b>	<b>34.1</b>	<b>41.34</b>	<b>47.85</b>	<b>53.58</b>	<b>60</b>	<b>13.29</b>	<b>12.18</b>	<b>9.5</b>	<b>9.32</b>	<b>9.67</b>
Old private sector banks	5.34	7.09	9.81	12.44	14	0.04	0.06	0.06	0.04	0.04
New private sector banks	28.76	34.25	38.04	41.14	46	13.25	12.12	9.44	9.28	9.63
<b>Foreign Banks</b>	<b>4.02</b>	<b>4.39</b>	<b>4.43</b>	<b>3.92</b>	<b>3.8</b>	<b>10.33</b>	<b>9.08</b>	<b>5.57</b>	<b>5.64</b>	<b>4.92</b>
<b>All scheduled commercial banks (i+ii)</b>	<b>102.44</b>	<b>137.43</b>	<b>181.97</b>	<b>227.84</b>	<b>278</b>	<b>27.55</b>	<b>24.7</b>	<b>18.33</b>	<b>18.04</b>	<b>17.65</b>

It is observed that the number of outstanding credit cards in case of public sector banks and private sector banks decreased during the 2010-11, while that of foreign banks witnessed an increase in the same year. At the end of March 2012, more than half of the total outstanding credit cards in India belong to new private sector banks.



#### RESULTS ABOUT PRODUCTIVITY OF BANKS

As stated earlier the objective of this paper is to analyze the influence of e- delivery channels on productivity performance of selected scheduled commercial banks. Accordingly, the data has been processed with the help of spss and the results of the analysis are given in tables 5 to 8.

Table 5 presents various productivity ratios during 2007 to 2012 for various banks under this study. Deposit per employee

which represents the potency of the banks in liquidity support is showing an upward trend. During 2007-08, per employee deposit ratio was the highest in the case of foreign banks (Rs. 61.07 million) and the lowest in case of SBI and its Associates with (Rs. 31.08 million). In 2011-12, foreign banks (with Rs.100.03 million) were on the top followed by nationalized banks (with Rs. 73.24 million) in so far as the deposits per employee are concerned. It is obvious from the table that on an average of the last five years, the amount of deposit per employee is the highest (Rs. 80.43 million) in case of foreign banks followed, with wide difference by nationalized banks (Rs. 55.13 million), new private banks (Rs. 49.01 million), old private banks (Rs. 42.49 million) and SBI and its associates, where the productivity is seen the lowest (Rs. 40.85 million). This ratio is showing a remarkable positive change during 2007 to 2012. The same phenomenon is observed about Credit per employee.

**Table 5: Averages of Productivity ratios of banks for the periods 2007-2008 to 2011-2012(Rs. Million)**

Banks per	Year	Deposit per	Credit per		Profit per	Deposit per	Credit
	Profit per						
Foreign Banks	2007-08	61.07	51.48	2.11	6901.12	5817.07	238.71
	2008-09	72.37	55.91	2.54	7256.83	5606.26	254.56
	2009-10	82.86	58.28	1.69	7535.7	5300.66	153.93
	2010-11	85.83	69.72	2.75	7592.01	6167.53	243.5
	2011-12	100.03	82.98	3.4	8577.81	7116.05	291.83
	<b>Grand Average</b>	<b>80.43</b>	<b>63.67</b>	<b>2.5</b>	<b>7572.69</b>	<b>6001.51</b>	<b>236.51</b>
Nationalized Banks (Includes IDBI Bank Ltd.)	2007-08	36.02	25.81	0.38	427.97	306.63	4.48
	2008-09	45.49	32.83	0.49	514.14	371.07	5.49
	2009-10	54.62	38.96	0.57	594.66	424.17	6.17
	2010-11	66.28	48.97	0.7	675.46	499.11	7.14
	2011-12	73.24	55.51	0.7	719.21	545.12	6.83
	<b>Grand Average</b>	<b>55.13</b>	<b>40.42</b>	<b>0.57</b>	<b>586.29</b>	<b>429.22</b>	<b>6.02</b>
New Private Sector Banks	2007-08	43.08	34.39	0.64	1401.5	1118.93	20.75
	2008-09	42.97	35.75	0.68	1239.57	1031.21	19.52
	2009-10	46.51	37.53	0.85	1133.23	914.29	20.64
	2010-11	55.73	46.24	1.1	1058.17	878.08	20.93
	2011-12	56.74	48.65	1.24	1093.46	937.63	23.93
	<b>Grand Average</b>	<b>49.01</b>	<b>40.51</b>	<b>0.9</b>	<b>1185.18</b>	<b>976.03</b>	<b>21.16</b>
Old Private Sector Banks	2007-08	34	22.93	0.41	353.07	238.1	4.22
	2008-09	38.81	25.03	0.47	406.02	261.83	4.91
	2009-10	41.76	27.99	0.42	440.42	295.18	4.43
	2010-11	47.7	33.34	0.56	522.98	365.57	6.14
	2011-12	50.17	36.54	0.62	568.66	414.21	7.06
	<b>Grand Average</b>	<b>42.49</b>	<b>29.17</b>	<b>0.5</b>	<b>458.23</b>	<b>314.98</b>	<b>5.35</b>
SBI and its Associates	2007-08	31.08	23.84	0.36	488.31	374.64	5.68
	2008-09	37.49	27.53	0.44	596.09	437.7	7.04
	2009-10	41.56	32.18	0.47	609.58	471.96	6.84
	2010-11	43.97	35.08	0.42	658.18	525.2	6.27
	2011-12	50.13	41.1	0.55	721.08	591.22	7.87
	<b>Grand Average</b>	<b>40.85</b>	<b>31.95</b>	<b>0.45</b>	<b>614.65</b>	<b>480.14</b>	<b>6.74</b>

The amount of profit per employee was also seen the highest in case of foreign banks (Rs. 2.5 million) followed, in down side with significant gap, by new private banks (Rs. 0.9 million) and nationalized banks (Rs. 0.57 million), SBI and its associate indicates the poorest (Rs. 0.45 million) profitability per employee during 2008-2012 as compared to other bank groups. Domestic banks have no match with the foreign banks in so far as deposits, credits and profit per branch are concerned. Amongst domestic banks, new

private sector banks have the highest credit per branch and profit per branch. Public sector banks are lagging in term of branch productivity as compared to other bank groups except old private banks. The table further shows that both the employee productivity as well as branch productivity have shown a remarkable growth during study period.

To assess the impact of various e-delivery channels on the productivity of banks in India regression analysis is made. For the regression analysis, the productivity per employee and productivity per branch are taken as dependent variables and e-delivery channels like Per cent of ATMs to Branches, Per cent of Off-site ATMs to total ATMs, Outstanding Number of Debit Card and Outstanding Number of Credit Card are independent variables. The model summary indicating R, R<sup>2</sup>, adjusted R<sup>2</sup>, F-value and the regression coefficients are shown in Table 6. In order to examine the problem of multi-colinearity in the data Durbin Watson statistics has been applied. Table 6 indicates that value of Durbin Watson test for all the bank groups is more than 2 which shows no auto correlation in the sample. Hence our data on various variables do not have the problem of multi-colinearity. F-test has been applied to

examine variation, whether the variation in productivity i.e. deposits, credits and profits (dependent variable) with the changes in the e-delivery channels (independent variable) is significant. When F value is found significant, we can proceed further for regression analysis.

Table 6 indicates that F-value and the corresponding p value of all the bank groups are significant at 5 percent level for 'deposits per employee' as dependent variable and e-delivery channels as independent variable. It implies that deposit per employee varies significantly with the change in e-delivery channels and it is true across the selected banks. This is further confirmed by noting the high degree of coefficient of determination (R<sup>2</sup>) in case of all bank groups. The p value given in table 7 indicates that 'outstanding number of credit card' is an important variable influencing deposit per employee in case of foreign bank group. However the outstanding no. debit cards is an important variable that influence deposit per employee positively and significantly in case of the remaining four groups of banks namely nationalized banks, new private banks, old private banks and SBI and its associates.

**Table 6: Model Summary for the relationship between productivity of banks and e-delivery channels**

Dependent Variable	Banks	Mean	Std. Deviation	R	R <sup>2</sup>	Durbin-Watson	F	P Value
Deposit per Employee	FOREIGN BANKS(G1)	80.43	14.65	.933 <sup>a</sup>	0.871	1.973	20.26	.020 <sup>b</sup>
	NATIONALIZED BANKS(G2)	55.13	15.09	.991 <sup>a</sup>	0.981	1.812	158.206	.001 <sup>b</sup>
	NEW PRIVATE SECTOR BANKS(G3)	49.01	6.76	.902 <sup>a</sup>	0.814	2.34	13.123	.036 <sup>b</sup>
	OLD PRIVATE SECTOR BANKS(G4)	42.49	6.56	.993 <sup>a</sup>	0.986	3.432	215.7910	.001
	SBI AND ITS ASSOCIATES(G5)	40.85	7.13	0.984	0.968	2.223	1.835	0.002
Credit per Employee	FOREIGN BANKS(G1)	63.67	12.72	0.902	0.814	2.522	13.157	0.036
	NATIONALIZED BANKS(G2)	40.42	11.98	0.995	0.991	2.6	319.63	0
	NEW PRIVATE SECTOR BANKS(G3)	40.51	6.48	0.924	0.854	2.228	17.504	0.025
	OLD PRIVATE SECTOR BANKS(G4)	29.17	5.68	0.992	0.984	2.603	187.873	0.001
	SBI AND ITS ASSOCIATES(G5)	31.95	6.69	0.997	0.994	2.977	465.148	0
Profit per Employee	FOREIGN BANKS(G1)	2.5	0.65	0.908	0.824	2.363	14.014	0.033
	NATIONALIZED BANKS(G2)	0.57	0.14	0.952	0.907	2.021	29.343	0.012
	NEW PRIVATE SECTOR BANKS(G3)	0.9	0.26	0.956	0.914	2.073	1.95	0.011
	OLD PRIVATE SECTOR BANKS(G4)	0.5	0.09	0.923	0.853	3.101	17.38	0.025
	SBI AND ITS ASSOCIATES` (G5)	0.45	0.07	0.835	0.698	2.737	2.306	0.302
Deposit per Branch	FOREIGN BANKS(G1)	7572.69	625.06	0.67	0.448	2.503	0.813	0.552
	NATIONALIZED BANKS(G2)	586.29	118.28	0.999	0.997	2.794	375.309	0.003
	NEW PRIVATE SECTOR BANKS(G3)	1185.19	138.74	0.963	0.927	3.293	38.12	0.009
	OLD PRIVATE SECTOR BANKS(G4)	458.23	87.31	0.99	0.981	2.634	155.58	0.001
	SBI AND ITS ASSOCIATES(G5)	614.65	85.96	0.974	0.949	1.87	55.292	0.005
Credit per Branch	FOREIGN BANKS(G1)	6001.51	698.43	0.904	0.818	2.636	13.46	0.035
	NATIONALIZED BANKS(G2)	429.22	95.85	0.99	0.981	1.96	154.87	0.001
	NEW PRIVATE SECTOR BANKS(G3)	976.03	97.91	0.983	0.966	2.937	84.732	0.003
	OLD PRIVATE SECTOR BANKS(G4)	314.98	73.37	0.995	0.989	2.877	282.557	0
	SBI AND ITS ASSOCIATES(G5)	480.14	82.72	0.994	0.988	2.895	250.874	0.001
Profit per Branch	FOREIGN BANKS(G1)	236.51	50.64	0.762	0.581	1.98	1.385	0.419
	NATIONALIZED BANKS(G2)	6.02	1.07	0.907	0.823	1.919	13.902	0.034
	NEW PRIVATE SECTOR BANKS(G3)	21.15	1.65	0.916	0.84	1.749	15.747	0.029
	OLD PRIVATE SECTOR BANKS(G4)	5.35	1.21	0.943	0.89	2.912	24.215	0.016
	SBI AND ITS ASSOCIATES(G5)	6.74	0.82	0.765	0.585	2.426	1.407	0.415

Regarding the linear relationship between credit per employee and various e- delivery channels it can be noted from the table 6 that F value is significant irrespective of the bank group. The

relationship between the variables under reference is also confirmed by the values of coefficient of determination, which are above 0.814 in case of various bank groups. Hence, more

**Table 7: Regression Coefficients for the relationship between Employee Productivity of banks and e - delivery channels**

Dependent Variable	Bank Group	Model	Unstandardized Coefficients		Standardized Coefficients	t	P Value	
			B	Std. Error	Beta			
Deposit per Employee	FOREIGN BANKS (G1)	1 (Constant)	120.47	9.3		12.95	0	
		Outstanding Number of Credit Card	-5.63	1.25	-0.93	-4.5	0.02	
	NATIONALIZED BANKS (G2)	1 (Constant)	24.19	2.68		9.03	0	
		Outstanding Number of Debit Card	0.5	0.04	0.99	12.58	0	
	NEW PRIVATE SECTOR BANKS (G3)	1 (Constant)	14.06	9.76		1.44	0.25	
		Outstanding Number of Debit Card	0.93	0.26	0.9	3.62	0.04	
	OLD PRIVATE SECTOR BANKS (G4)	1 (Constant)	24.859	1.264		19.667	0	
		Outstanding Number of Debit Card	1.811	0.123	0.993	14.69	0.001	
	SBI AND ITS ASSOCIATES	1 (Constant)	24.162	1.86		12.991	0.001	
		Outstanding Number of Debit Card	0.232	0.024	0.984	9.583	0.002	
	Credit per Employee	FOREIGN BANKS (G1)	1 (Constant)	-	74.66		-	0.069
			Percent of Offsite ATMs to total ATMs	3.559	0.981	0.902	3.627	0.036
NATIONALIZED BANKS (G2)		1 (Constant)	15.737	1.504		10.465	0.002	
		Outstanding Number of Debit Card	0.397	0.022	0.995	17.878	0	
NEW PRIVATE SECTOR BANKS (G3)		1 (Constant)	6.199	8.301		0.747	0.509	
		Outstanding Number of Debit Card	0.912	0.218	0.924	4.184	0.025	
OLD PRIVATE SECTOR BANKS (G4)		1 (Constant)	24.859	1.264		19.667	0	
		Outstanding Number of Debit Card	1.811	0.123	0.993	14.69	0.001	
SBI AND ITS ASSOCIATES		1 (Constant)	16.086	0.786		20.476	0	
		Outstanding Number of Debit Card	0.22	0.01	0.997	21.567	0	
Profit per Employee		FOREIGN BANKS (G1)	1 (Constant)	-11.378	3.709		-	0.055
			Percent of Offsite ATMs to total ATMs	0.182	0.049	0.908	3.744	0.033
	NATIONALIZED BANKS (G2)	1 (Constant)	0.296	0.055		5.402	0.012	
		Outstanding Number of Debit Card	0.004	0.001	0.952	5.417	0.012	
	NEW PRIVATE SECTOR BANKS (G3)	1 (Constant)	-5.132	0.257		-2.072	0.13	
		Outstanding Number of Debit Card	0.038	0.007	0.956	5.652	0.011	
	OLD PRIVATE SECTOR BANKS (G4)	1 (Constant)	0.237	0.065		3.652	0.035	
		Outstanding Number of Debit Card	0.004	0.001	0.923	4.169	0.025	
	SBI AND ITS ASSOCIATES	1 (Constant)	0.328	0.076		4.301	0.05	
		Outstanding Number of Debit Card	0.003	0.003	1.374	1.102	0.385	
		Percent of ATMs to Branches	-0.001	0.002	-0.589	-0.472	0.683	

than 81 percent of the variation in credit per employee is caused by e-delivery channels. Regarding the importance of various factors affecting credit per employee table 7 indicates that 'percent of off-site ATMs to total ATMs' is a significant

variable in case of foreign banks. The outstanding number of debit cards is found having the t- values significant at 5 percent level in case of the remaining bank groups. It implies that credit per employee increases with the increase in number of

**Table 8: Regression Coefficients for the relationship between Branch Productivity of banks and e - delivery channels**

Dependent Variable	Bank Group	Model	Unstandardized Coefficients		Standardized Coefficients	T	P Value	
			B	Std. Error	Beta			
Deposit per Branch	FOREIGN BANKS (G1)	1 (Constant)	-3508.832	19095.112		-0.184	0.871	
		Outstanding Number of Debit Card	1229.694	2996.092	0.557	0.41	0.721	
		Per centof ATMs to Branches	15.558	18.405	1.148	0.845	0.487	
	NATIONALIZED BANKS (G2)	2 (Constant)	760.043	77.337		9.828	0.01	
		Outstanding Number of Debit Card	4.531	0.191	1.151	23.748	0.002	
		Per centof ATMs to Branches	-12.262	2.275	-0.261	-5.389	0.033	
	NEW PRIVATE SECTOR BANKS (G3)	1 (Constant)	396.857	129.141		3.073	0.054	
		Outstanding Number of Credit Card	73.374	11.884	0.963	6.174	0.009	
	OLD PRIVATE SECTOR BANKS (G4)	1 (Constant)	224.327	19.751		11.358	0.001	
		Outstanding Number of Debit Card	24.025	1.926	0.99	12.473	0.001	
	SBI AND ITS ASSOCIATES (G5)	1 (Constant)	1164.127	74.579		15.609	0.001	
		Outstanding Number of Credit Card	-211.664	28.465	-0.974	-7.436	0.005	
	Credit per Branch	FOREIGN BANKS (G1)	1 (Constant)	698.396	1453.624		0.48	0.664
			Per centof ATMs to Branches	13.694	3.732	0.904	3.669	0.035
		NATIONALIZED BANKS (G2)	1 (Constant)	232.711	17.202		13.528	0.001
Outstanding Number of Debit Card			3.158	0.254	0.99	12.445	0.001	
NEW PRIVATE SECTOR BANKS (G3)		1 (Constant)	408.184	62.393		6.542	0.007	
		Outstanding Number of Credit Card	52.852	5.742	0.983	9.205	0.003	
OLD PRIVATE SECTOR BANKS (G4)		1 (Constant)	90.378	13.914		6.495	0.007	
		Per cent of ATMs to Branches	3.071	0.183	0.995	16.809	0	
SBI AND ITS ASSOCIATES (G5)		1 (Constant)	284.506	13.196		21.561	0	
		Outstanding Number of Debit Card	2.717	0.172	0.994	15.839	0.001	
Profit per Branch		FOREIGN BANKS (G1)	1 (Constant)	-124.642	1348.794		-0.092	0.935
			Outstanding Number of Debit Card	5.889	211.631	0.033	0.028	0.098
	Per centof ATMs to Branches		0.87	1.3	0.792	0.669	0.572	
	NATIONALIZED BANKS (G2)	1 (Constant)	2.104	1.076		1.954	0.146	
		Per centof ATMs to Branches	0.081	0.022	0.907	3.729	0.034	
	NEW PRIVATE SECTOR BANKS (G3)	1 (Constant)	-3.205	6.148		-0.521	0.638	
		Per cent of Off-site ATMs to total ATMs	0.401	0.101	0.916	3.968	0.029	
	OLD PRIVATE SECTOR BANKS (G4)	1 (Constant)	1.837	0.744		2.47	0.09	
		Per cent of ATMs to Branches	0.048	0.01	0.943	4.921	0.016	
	SBI AND ITS ASSOCIATES (G5)	1 (Constant)	5.731	1.057		5.424	0.032	
		Outstanding Number of Debit Card	0.047	0.04	1.719	1.176	0.361	
		Per cent of ATMs to Branches	-0.022	0.03	-1.088	-0.744	0.534	



debit cards.

It is obvious from table 6 that F value is significant in case of all bank groups except State Bank of India group because p value is less than .05 in these cases when 'profit per employee' is taken as dependent variable. The above results are also supported by coefficient of determination which is above 0.82 in various bank groups except State Bank of India and its associates. The results of step wise method of multiple regression when profit per employee is taken as dependent variable and e- delivery channels as independent variable reveals that regression coefficients of the variable 'percent of off-site ATMs to total ATMs' is significant at 5 percent level in case of foreign banks. 'Percent of ATMs to total branches' is found an important determinant of profit per employee in case of old private sector banks where  $t = 4.169$  and  $p$  is less than 0.05. In case of nationalized banks and new private banks the regression coefficient for profit per employee are found positive and significant (Table 7).

Table 6 shows further that p value of F-test when 'deposit per branch' is considered as dependent variable significant at 5 percent level for all bank groups except foreign banks. So, it is concluded that there is a significant relationship between e-delivery channels and deposit per branch of various bank groups. Hence, deposit per branch rise with the rise in e-channels. The above results are also supported by coefficient of determination which is above 0.92 in various bank groups except foreign banks.

The regression results about 'deposit per branch' as presented in Table 8 shows that p value of predictor in case of SBI and its associates is not significant at 5 percent level which means branch productivity of this bank group is not significantly related with the 'outstanding number of debit card' and 'percent of ATMs to branches'. However, the outstanding number of debit cards and outstanding numbers of credit cards are found having the t- values significant at 5 percent level in case of the remaining bank groups meaning thereby the e- channels exert significant influence on branch productivity.

For 'credit per branch', F- value and the corresponding p value of all the bank groups are significant at 5 percent level (Table 6). So we reject the null hypothesis regarding this ratio. The relationship between the variables under reference is also confirmed by the value of coefficient of determination, which is above 0.82 in case of various bank groups. Hence, more than 82 percent of the variation in 'credit per branch' is caused by e-delivery channels. Table 8 indicates that the standardized beta is positive and approaching to 1 in case of all bank groups. It also reveals that 'percent of ATMs to total branches' is a significant variable affecting credit per branch in case of foreign banks and old private sector banks but for the other bank group 'outstanding number of debit cards' has turned as an important variable. Both of these variables are found having the t- value significant at 5 percent level in case of all the bank groups. It implies that 'credit per branch' increases with the increase in percent of ATMs to total branches and number of debit cards.

Table 6 further shows that F value in case of 'profit per branch' as dependent factor and e- delivery channels as independent

is not significant at 5 percent level for the foreign banks and SBI and its associates. It is also confirmed by the moderate degree coefficient of determination ( $R^2$ ) in case of these bank groups. The p value for regression coefficients of branch productivity as given in table 8 indicates that 'percent of ATM to branches' is an important variable influencing profit per branch in case of nationalized banks and new private banks. It further shows that p-value corresponding to regression coefficients of profit per branch is not significant in case of foreign banks and SBI and its associates so we accept the null hypothesis and conclude that no relationship exists among various e-delivery channels and profit per branch performance of these bank groups.

But in case of other bank groups, p -value corresponding to profit per branch ratio is significant at 5 percent level. So, we reject the null hypothesis and conclude that percent of ATM to branches and percent of off-site ATM to total ATMs have influence on profit per branch of these bank groups.



## CONCLUSION

The analysis has brought out that number of ATMs, use of Debit cards, Credit cards and extent of computerization have increased in all bank groups during 2007 to 2012. The new private sector banks have the largest share in off-site ATMs, while nationalised banks have the largest share in on-site ATMs. Over the years, the percentage of off-site ATMs to total ATMs has come very near to that of on-site ATMs. The foreign banks have an edge over domestic private sector as well as public sector banks in terms of the ratio of their ATMs to their branches.

The 'outstanding number of credit card' and 'percent of off-site ATMs to total ATMs' are found important variables influencing deposit per employee and credit per employee respectively in case of foreign banks. The deposit per employee and credit per employee have changed significantly with the rise in e- delivery channels. It is true across the selected banks. The ratio of 'percent of ATMs to total branches' is found as an important determinant of 'profit per employee'.

Domestic banks have no match with the foreign banks in so far as deposits, credits and profit per branch are concerned. Amongst domestic banks, new private sector banks have the highest credit per branch and profit per branch. Public sector banks are lagging in term of branch productivity as compared to other bank groups except old private banks. There is a significant relationship between e-delivery channels and deposit per branch of various bank groups except SBI group. Hence, deposit per branch rises with the rise in e- channels significantly. The ratio of 'credit per branch' increases with the increase in 'percent of ATM's to total branches' and 'number of debit cards'. Results also indicated that 'percent of ATMs to branches' is an important variable influencing profit per branch in case of nationalized banks and new private banks.

The results brought out by the study regarding the use of various e-delivery channels and its impact on productivity of banks will prove very useful for decision makers and policy makers in the banking industry. The study is an eye opener for those banks which have still not fully adopted edcore banking

solutions. All the banks should give more stress to modify their services, through e-delivery channels. The adoption of e-delivery channels might help in improving the CRM in banks, which is essential for enhanced customer satisfaction. The study emphasizes that the banks should consider the expenditure on building the infrastructure of IT as an investment not expenses. In future only those banks would survive which are adopting the information technology fastly with the changing requirement of the customers. There are so many factors which influence productivity of employee. However, in the present study the influence of other factors has not been considered, which will remain the limitation of the study. It can be concluded that mere introduction of e-delivery channels alone will not be sufficient to bring

necessary performance improvement and to get the competitive edge; intelligent people are required to use such intelligent tools. Thus, even though e-delivery channels have brought about higher productivity in banking sector, marketing is going to be the challenge. Other limitation of the present study is that the results are based only on secondary data. Hence, the future researchers may take into account this limitation by considering both primary as well as secondary data so as to make the study more useful. This study will be more useful for those banks, who are interested in investing heavily in e-delivery channels to increase their productivity.

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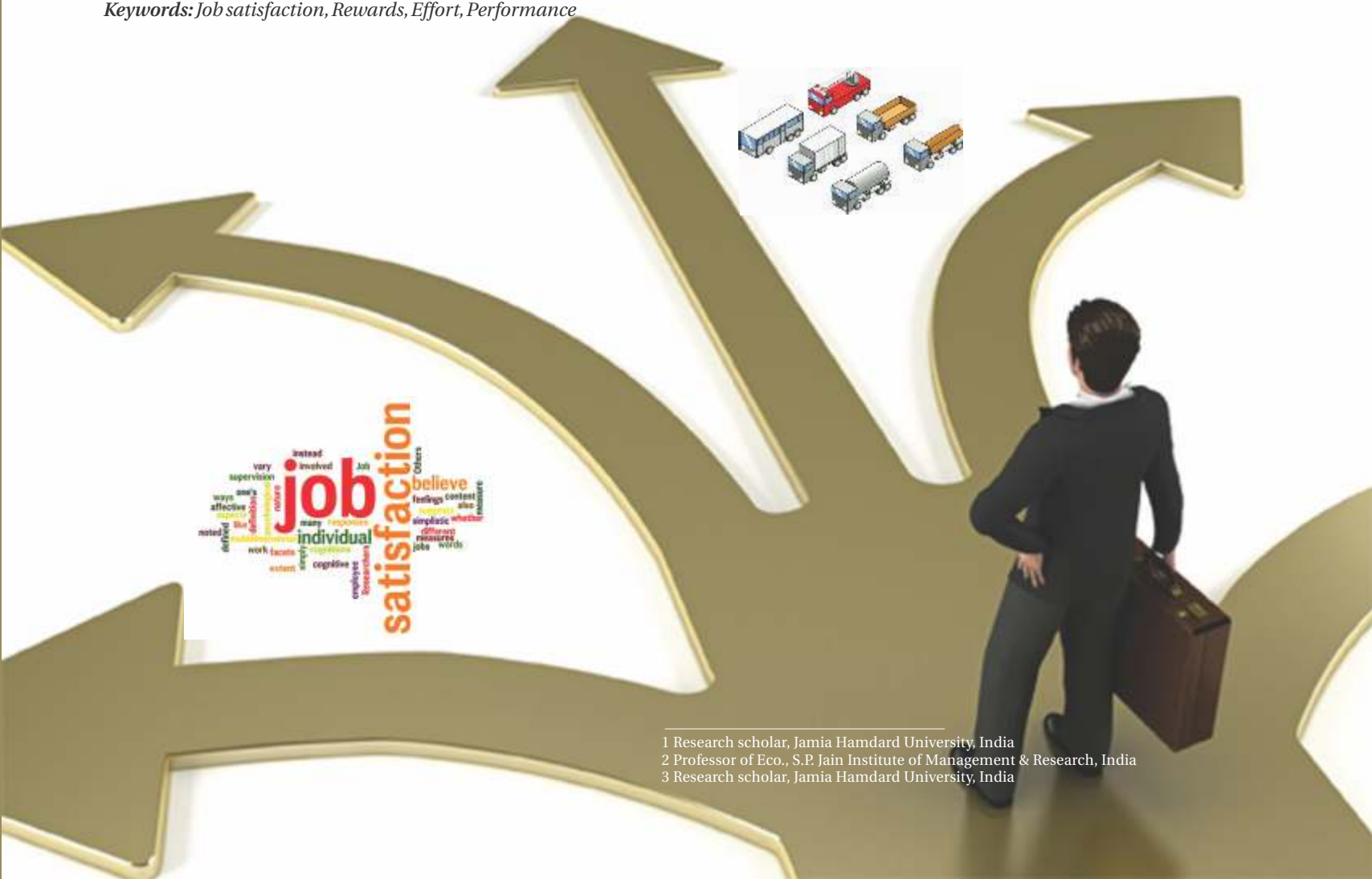
# THE IMPACT OF JOB SATISFACTION ON JOB PERFORMANCE OF EMPLOYEES IN HARYANA ROADWAYS

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## ABSTRACT

Employee's attitude is important to management because it helps in determining the behavior of workers in the organization. A satisfied work force creates a pleasant atmosphere within the organization to perform well. Hence job satisfaction has become a major topic for research studies. The specific problem addressed in this study is to examine the impact of job satisfaction on performance. It considered which rewards (intrinsic and extrinsic) determine job satisfaction of an employee. Data were collected through a field survey using a questionnaire from three employee groups, namely Managers, Non-managers and drivers from three districts of Haryana. The analysis data revealed that there is a positive correlation between job satisfaction and performance of employees.

**Keywords:** Job satisfaction, Rewards, Effort, Performance



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**INTRODUCTION**

Attainment of a high level performance through productivity and efficiency has always been an organizational goal of high priority. Satisfied worker leads to extend more effort to job performance, then works harder and better. Thus every organization tries to create a satisfied work force to operate the well-being of the organization. However, the total organizational performance depends on efficient and effective performance of individual employees of the organization. Therefore, every organization relies considerably on their individual employee performance to gain high productivity in the organization. Employee effort is an important factor that determines an individual performance. When an employee feels a satisfaction about the job, he/she is motivated to do greater effort to the job performance. Then it tends to increase the overall performance of the organization. In other words, a satisfied individual employee and his effort and commitment are crucial for the success of an organization.

At its most general level of conceptualization, job satisfaction is simply how content an individual is with his or her job. At the more specific levels of conceptualization used by academic researchers and human resources professionals, job satisfaction has varying definitions. Affective job satisfaction (Thompson et. al., 2012) is the extent of pleasurable emotional feelings individuals have about their jobs overall, and is different to cognitive job satisfaction (Moorman, 1993) which is the extent of individuals' satisfaction with particular facets of their jobs, such as pay, pension arrangements, working hours, and numerous other aspects of their jobs.

Employee satisfaction is thought to be one of the primary requirements of a well-run organization and considered an imperative by all corporate managements. Locke (1970) defined job satisfaction as “a pleasurable or positive emotional state, resulting from the appraisal of one's job experiences.” According to Dewhurst et al. (2010) there are other means to reward employees that do not just focus on financial compensation. Some of these include the praise that employees are able to acquire from their managers, the opportunity to take on important projects or tasks, and even leadership attention. Frederick Herzberg (1987), a behavioral scientist proposed a two-factor theory or the motivator-hygiene theory. According to Herzberg, there are some job factors that result in satisfaction while there are other job factors that prevent dissatisfaction. According to Herzberg, the opposite of “Satisfaction” is “No satisfaction” and the opposite of “Dissatisfaction” is “No Dissatisfaction”. Satisfaction and dissatisfaction cannot be considered as the opposite ends of one continuum. Therefore an increase in the level of job satisfaction does not necessarily imply a decrease in job dissatisfaction, since the elements affecting satisfaction and dissatisfaction are different. The Two-Factor is also often referred to as the Motivation-Hygiene Theory (Davies, 2008).

**OBJECTIVES**

- 1 To survey the literature concerning the relationship

between job satisfaction and job performance of the employees.

2. To determine the level of job satisfaction of the Haryana Roadways employees on their extrinsic rewards.
3. To determine the level of job satisfaction of the Haryana Roadways employees on their intrinsic rewards.
4. To assess the level of relationship between extrinsic rewards of job satisfaction and performance of the employees.
- 5 To assess the level of relationship between intrinsic rewards of job satisfaction and performance of the employees.



**LITERATURE REVIEW**

**Job Satisfaction**

It is the general understanding that job satisfaction is an attitude towards job. In other words job satisfaction is an affective or emotional response toward various facets of one's job. A person with a high level of job satisfaction holds positive attitudes towards his or her job, while a person who is dissatisfied with his or her job holds negative attitudes about the job. Job satisfaction is also defined as reintegration of affect produced by individual's perception of fulfillment of his needs in relation to his work and the surrounding it (Saiyaden, 1993). There are a number of factors that influence job satisfaction. The major ones can be summarized by recalling the dimensions of job satisfaction. They are pay, the work itself, promotions, supervision, workgroup, and working conditions (Luthans 1985).

Job satisfaction is connected to how our personal expectations of work are in congruence with the actual outcomes. And since job satisfaction is merely an employee's attitude towards his or job, previously discussed theories regarding attitudes are applicable to job satisfaction. Consequently job satisfaction can be seen as containing three components: an affective component, a cognitive component and a behavioral component (Jex, 2002). While the affective component refers to a feeling about a job, the cognitive component represents a belief in regard to a job. Often these two aspects are related. The behavioral component is an indicator for behavioral intentions towards a job such as getting to work in time, working hard, etc. Job meaningfulness can be defined as the product of three dimensions: skill variety, task identity and task significance. Experienced responsibility is a function of autonomy and knowledge of results is dependent on feedback. The psychological state that receives the most attention in Hackman and Oldham's study is the meaningfulness of work (Tosi et. al., 2000).

The main objective of reward programs are attract qualified people to join the organization to keep employees coming to work and to motivate employees to achieve high level of performance. Though the rewards are provided by the organization, they are evaluated by the individual. To the extent that the rewards are adequate and equitable, the

individual achieves a level of satisfaction. The rewards can be broadly categorized in to two groups, namely intrinsic rewards and extrinsic rewards. Intrinsic rewards are psychological rewards that are experienced directly by an individual. These are defined as rewards that are part of the job itself. (Gibson, Ivancevich and Donnely, 1991). It had also defined as psychological reward that is experienced directly by an employee (Stoner and Freeman, 1992). Extrinsic rewards are provided by an outside agent such as supervisor or work group. These rewards had been defined as rewards external to the job (Gibson, Ivancevich and Donnely, 1991). Pay, promotions, interpersonal relationships, status and fringe benefits are some of the examples for extrinsic rewards. Responsibility, achievement, autonomy, personal growth, challenge, complete work and feedback characteristics of the job are some intrinsic rewards.

**H1.0: There exists no significant difference between employee's job satisfactions with extrinsic rewards.**

**H1.1: There exists significant difference between employee's job satisfactions with extrinsic rewards.**

**H2.0: There exists no significant difference between employee's job satisfactions with intrinsic rewards.**

**H2.1: There exists significant difference between employee's job satisfactions with intrinsic rewards.**

**PERFORMANCE**

On a very general level job performance can be defined as “all the behaviors employees engage in while at work” (Jex, 2002). However, this is a rather vague description. A fair amount of the employee's behavior displayed at work is not necessarily related to job-specific aspects. More commonly, job performance refers to how well someone performs at his or her work.

Performance very much depends on perception, values and attitudes. There appear to be so many variables influencing the job performance that is almost impossible to make sense of them. Performance is defined as a function of individual ability and skill and effort in a given situation (Porter and Lawler, 1974).

The majority of the studies have shifted their focus on defining job performance in terms of outcomes and behavior, since these are easier and more objective to define and to observe than personal traits (Hersens, 2004).

**JOB SATISFACTION AND PERFORMANCE**

The relationship between job satisfaction and performance has been critically assessed in a variety of organizational settings. Results of these studies have been mixed. Cummings (1970) identified three major points of view concerning this relationship. Satisfaction causes performance, performance causes satisfaction and rewards cause both performance and satisfaction. All of these three views are supported by various researches. Mirvis and Lawer (1977) produced conclusive

findings about the relationship between job satisfaction and performance. In attempting to measure the performance of bank tellers in terms of cash shortages, their proposed arguments are satisfied tellers were less likely to show shortages and less likely to leave their jobs. Kornhanuser and Sharp (1976) have conducted more than thirty studies to identify the relationship between satisfaction and performance in industrial sector. Many of the studies have found that a positive relationship existed between job satisfaction and performance. Katzell, Barret and Porker (1952) demonstrated that job satisfaction was associated neither with turnover nor with quality of production. From an employee's point of view job performance is essentially the result of a series of behaviors. The various tasks performed on a daily basis contribute to job performance in general (Cardy, 2004). From a supervisor's perspective, on the other hand, outcomes are the key elements for job performance appraisal. After all, at the end of the day results are more important to an employer than the activities leading to those results (Cardy, 2004).

Smith and Cranny (1968) reviewed the literature and concluded that satisfaction is associated with performance as well as effort, commitment and intention. In the western electric studies (1966) the evidence from the Relay Assembly test room showed a dramatic tendency for increased employee productivity to be associate of with an increase in job satisfaction. Porter and Lowler (1969) suggested that satisfaction will affect a worker's effort, arguing that increased satisfaction from performance possibility helps to increase expectations of performance leading to rewards, Carroll, Keflas and Watson (1964) found that satisfaction and productivity are crucial relationship in which each affects the other. They suggest that performance leads to more effort because of high perceived expectancy. The effort leads to effective performance, which again leads to satisfaction in crucial relationship. David, Joseph and William (1970) suggest that the type of reward system under which workers perform strongly influence the satisfaction performance relationship.

**H3.0: There exists no correlation between intrinsic rewards of job satisfaction and performance of the employees.**

**H3.1: There exists a positive correlation between intrinsic rewards of job satisfaction and performance of the employees.**

**H4.0: There exists no correlation between extrinsic rewards of job satisfaction and performance of the employees.**

**H4.1: There exists a positive correlation between extrinsic rewards of job satisfaction and performance of the employees.**



**ETHODOLOGY**

The study included both exploratory as well as conclusive phases. Whereas exploratory phase was used primarily for back- ground study and questionnaire development, conclusive study dealt with data collection from actual respondents through a

structured questionnaire.

4.1 Designing of research instrument

Background of the study included exploration into which factors contribute to job satisfaction of the employees working in the organization. The primary data was collected using the questionnaire method; it affords the advantages of speed, cost and versatility. The questionnaire was developed using the review of literature. To avoid any subjectivity bias, questionnaire included the questions and the information based on the various levels of the data measurement. The respondents are instructed to tick an appropriate box for each question. Some close – ended questions were also included. To assess the employee job performance with job satisfaction various parameters are considered for the present study. These job facets are self esteem or respect, opportunity for growth, workplace environment, amount of close supervision, opportunity for independent thought, feelings of security, opportunity for feedback on performance, working hours, nature of work, workload, freedom on the job, pay for job, variety on the job, feeling of accomplishment, opportunity to help others, opportunity for participation, opportunity for close friendships, opportunity for promotion, amount of respect and fair treatment, benefits plans and compensation on the job. The employee performance is measured in terms of effort extended to the job. The preliminary survey questionnaire was given independently to three professors from the subject area to obtain feedback regarding the content, layout, wording and ease of understanding the measurement items. They were also asked to offer suggestions for improving the proposed scale and to edit the items if necessary to enhance clarity, readability and content adequacy. In general, the comments were positive with some suggestions which were taken into account while revising the questionnaire. During the next stage, the questionnaire was administered on a group of respondents. Such interaction also proved to be of great help in finally deciding on the factors to be included in the study.

4.2 Sampling and mode of contact

A sample of 120 respondents was used for this study. Population for this research was defined as the employees working at the three levels in the Haryana Roadways:

Managers, Non-Managers and Drivers. Multistage Stratified random sampling was used except for managers. Though there are four managers in each sample attribute, there are in all four managers in each district: Traffic manager, Store manager, Works manager and Accounts manager.

As a part of multistage sampling Haryana state was selected from the whole of India. Further in Haryana the respondents were selected from the three districts of Haryana, namely, **Ambala, Hisar, Gurgaon** to carry out the research. Considering the stratified random sampling, this is a type of Probability sampling technique where the samples are gathered in a process that gives all the individuals in the population equal chances of being selected. In this sampling technique the entire target population is divided into different subgroups, or strata, and then proportionally the sample is selected randomly from the different strata.

Data Analysis

The coefficient of correlation is applied to identify the impact of job satisfaction on performance of employees and it is calculated by using level of job satisfaction as the X-variable (independent variable) and level of performance as the Y-variable (dependent variable) for two employee categories.

The statistical technique of paired comparison of means is also used to determine the satisfaction which is derived from extrinsic rewards or from intrinsic rewards. The reliability check was also conducted on the collected data.

RESULT AND ANALYSIS

Table 1: Composition of the Sample

Category	Number	%
Managers	12	10.0
Non-Managers	54	45.0
Drivers	54	45.0
Total	120	100

The above table gives the composition of the sample the data was collected from three districts of Haryana: Gurgaon, Ambala and Hisar. From the total sample collected 10% are the managers, 45% are the non managers and 45% are the drivers from these three districts.

Employees drive a level of job satisfaction from extrinsic job rewards.

Table 2(a): Extrinsic rewards and Job satisfaction

Extrinsic Variables	Mean Values			p values					
	M	NM	D	M-NM		M-D		NM-D	
Employees treated fairly and equally	4.0000	4.1538	4.0000	Sig. .007	Sig. (2-tailed) .043	Sig. -	Sig.(2 tailed) -	Sig. .000	Sig. (2 tailed) .043
Management listens to employees	3.7500	3.4615	3.3462	.019	.232	.110	.104	.050	.583
Employees treated with respect by management and fellow employees	4.0000	4.1154	4.0000	.018	.265	-	-	.000	.265
Compensated equally for the work they do	1.0000	1.0769	1.0000	.094	.434	-	-	.003	.161
Employees are paid fairly well	4.0000	4.0000	4.0000	.173	1.000	-	-	.014	1.000
Benefit package	3.7500	3.8846	4.0000	.096	.362	.000	.170	.000	.083
Health benefit	1.3750	1.8077	1.7308	.094	.018	.345	.069	.198	.520
Disability Benefit	1.7500	1.7692	1.8077	.445	.933	.519	.734	.051	.784
Retirement Plan	1.7500	1.7692	1.9231	.255	.939	.203	.303	.002	.308
Life insurance Plan	3.8750	3.3077	4.6923	.006	.091	.914	.000	.000	.000
Education assistance for number of kids	3.8750	4.5385	4.7308	.400	.010	.696	.000	.020	.190
Family benefit	4.0000	4.4615	4.8846	.013	.067	.717	.000	.000	.009

Note M- Managers  
 NM- Non- Managers  
 D- Drivers

By analyzing the Sig. (2-tailed) value for **managers and non-managers**, since the sig. (2-tailed) value for employees are treated fairly and equally, importance of health benefits and education assistance for number of kids is less than 0.05, we conclude that there is a statistically significant difference between the mean for managers and non-managers.

Since the sig. (2-tailed) value for management listens to the employees, employees are treated with respect by management and fellow employees, employees are compensated equally for the same job, employees are paid fairly well for the job they do, satisfaction with benefit package,

Since the sig. (2-tailed) value for management listens to the employees, employees are treated with respect by management and fellow employees, employees are compensated equally for the same job, employees are paid fairly well for the job they do, satisfaction with benefit package, importance of health benefit, importance of disability benefit, importance of retirement plans and education assistance for number of kids is greater than 0.05, we conclude that there exists no statistically significant difference between the mean for non-managers and drivers.

**Employees drive a level of job satisfaction from intrinsic job**

**Table 2(b): Intrinsic rewards and Job satisfaction**

Extrinsic Variables	Mean Values			p values					
	M	NM	D	M-NM		M-D		NM-D	
Employees are provided with constructive and useful feedback	3.6250	3.2308	2.9231	Sig. .197	Sig. (2-tailed) .038	Sig. .796	Sig.(2 tailed) .007	Sig. .480	Sig. (2 tailed) .045
Environment of workplace is complete and safe.	4.2500	4.0385	3.6923	.295	.253	.518	.006	.018	.009
Employees have resources needed to do their job well.	3.0000	2.6923	2.7692	.000	.018	.002	.083	.681	.664
Organization has roadmap for every employee's personal growth.	1.0000	1.5000	1.9231	-	.000	.094	.000	.000	.001
Organization provides employees with opportunities for personal growth.	4.0000	3.1923	2.6154	.000	.000	.000	.000	.012	.003
Working hours	4.3750	4.2308	2.5000	.197	.434	.288	.000	.003	.000
Shift time	4.1250	4.0000	2.5000	.648	.434	.003	.000	.000	.000
Nature of work	4.2500	4.0769	3.0385	.535	.378	.976	.000	.473	.000
Workload	4.2500	4.0769	2.1154	.535	.378	.096	.000	.381	.000
Satisfaction with working of company	3.7500	3.8077	4.0000	.836	.795	.000	.170	.000	.096

Note M- Managers NM- Non- Managers D- Drivers

importance of disability benefit, importance of retirement plans, importance of life insurance plans and satisfaction with family benefit is greater than 0.05, we conclude that there exists no statistically significant difference between the mean for managers and non-managers.

By analyzing the Sig. (2-tailed) value for **managers and drivers**, since the sig. (2-tailed) value for life insurance plans, education assistance for number of kids and satisfaction with family benefit is less than 0.05, we conclude that there is a statistically significant difference between the mean for managers and drivers.

Since the sig. (2-tailed) value for employees are treated fairly and equally, management listens to the employees, employees are treated with respect by management and fellow employees, employees are compensated equally for the same job, employees are paid fairly well for the job they do, satisfaction with benefit package, importance of health benefit, importance of disability benefit and importance of retirement plans is greater than 0.05, we conclude that there exists no statistically significant difference between the mean for managers and drivers.

By analyzing the Sig. (2-tailed) value for **non-managers and drivers**, since the sig. (2-tailed) value for employees are treated fairly and equally, importance of life insurance plans and satisfaction with family benefit is less than 0.05, we conclude that there is a statistically significant difference between the mean for non-managers and drivers.

**rewards.**

By analyzing the Sig. (2-tailed) value for **managers and non-managers**, since the sig. (2-tailed) value for employees are provided with constructive and useful feedback, employees have the resources needed to do their job, organizations have roadmap for every employee's personal growth and organization provide employees with opportunities for personal growth is less than 0.05, we conclude that there is a statistically significant difference between the mean for managers and non-managers.

Since the sig. (2-tailed) value for environment of workplace is complete and safe, satisfaction with working hours, satisfaction with shift time, satisfaction with nature of work and satisfaction with workload and satisfaction with working of the organization is greater than 0.05, we conclude that there exists no statistically significant difference between the mean for managers and non-managers.

By analyzing the Sig. (2-tailed) value for **managers and drivers**, since the sig. (2-tailed) value for employees are provided with constructive and useful feedback, environment of workplace is complete and safe, organizations have roadmap for every employees personal growth, organization provide employees with opportunities for personal growth, satisfaction with working hours, satisfaction with shift time, satisfaction with nature of work and satisfaction with workload is less than 0.05, we conclude that there is a statistically significant difference between the mean for managers and drivers.

Since the sig. (2-tailed) value for employees have resources

needed to do their job well and satisfaction with working of the organization is greater than 0.05, we conclude that there exists no statistically significant difference between the mean for managers and drivers.

By analyzing the Sig. (2-tailed) value for **non-managers and drivers**, since the sig. (2-tailed) value for employees are provided with constructive and useful feedback, environment of workplace is complete and safe, organizations have roadmap for every employee's personal growth, organization provide employees with opportunities for personal growth, satisfaction with working hours, satisfaction with shift time, satisfaction with nature of work and satisfaction with workload is less than 0.05, we conclude that there is a statistically significant difference between the mean for non-managers and drivers.

Since the sig. (2-tailed) value for employees have resources needed to do their job well and satisfaction with working of the organization is greater than 0.05, we conclude that there exists no statistically significant difference between the mean for non-managers and drivers.

**Correlation between intrinsic rewards of job satisfaction and performance of the employees**

There exists a positive correlation between intrinsic rewards of job satisfaction and performance of the employees. The factors of performance that are affected by various intrinsic rewards are work independently to perform duties, deliver quality work and delivers consistent and timely results. Correlation is computed to determine the relationship between intrinsic rewards with performance.

The result shows that there is a positive relationship between the various factors of job satisfaction and job performance of employees. The environment of work place is complete and safe. The employees working in Haryana Roadways have adequate opportunities for personal growth. The employees are satisfied with the number of working hours, with shift or time of work, with nature of work, and also with the workload

they have in the organization. All these factors of Job satisfaction are positively but weakly associated with employees work independently to perform duties, they deliver quality work and also with they deliver consistent and timely results. In summary, intrinsic rewards of job satisfaction are found to affect the job performance of the employees.

**Correlation between extrinsic rewards of job satisfaction and performance of the employees**

There exists a positive correlation between extrinsic rewards of job satisfaction and performance of the employees. The factors of performance that are affected by various extrinsic rewards are work independently to perform duties, deliver quality work and delivers consistent and timely results. Correlation is computed to determine the relationship between extrinsic rewards with performance.

The results show that there is a positive relationship between the various factors of job satisfaction with the variables of job performance. The employees are satisfied with the training and development of employees. The management listens to complaints of its employees. The employees working in Haryana Roadways have great importance of the health benefits, disability benefits, education assistance for number of kids and family benefit. All these variables of job satisfaction are positively but weakly correlated with employees work independently to perform duties, they deliver quality work and also with they deliver consistent and timely results. In summary, extrinsic rewards of job satisfaction are found to affect job performance of the employees working in Haryana Roadways.

**LIMITATIONS OF THE STUDY**

Following are a few limitations of the study:

- The sample size is not diverse enough to give the image of overall functioning of Haryana Roadways.
- The data collected is based on subjective productivity measurement; some other objective method of collecting

**Table 3: Intrinsic rewards and performance**

	Works independently to perform duties		Delivers quality work		Delivers consistent and timely results	
	r	p	r	p	r	p
Environment of workplace is complete and safe	r = .240	p = .065	r = .293	p = .023*	r = .331	p = .010**
Have adequate opportunity for personal growth	r = .436	p = .000**	r = .303	p = .019*	r = .319	p = .013*
Satisfaction with working hours	r = .182	p = .163	r = .338	p = .008**	r = .246	p = .058
Satisfaction with shift or time of work	r = .134	p = .308	r = .348	p = .006**	r = .327	p = .011
Satisfaction with nature of work	r = .284	p = .028*	r = .308	p = .017*	r = .131	p = .320
Satisfaction with workload you have	r = .365	p = .004**	r = .403	p = .001**	r = .397	p = .002**

Note \*\* Correlation is significant at the 0.01 level (2-tailed). r = indicate the direction of the relationship.  
 \* Correlation is significant at the 0.05 level (2-tailed). p = indicate the significance level.

**Table 4: Extrinsic rewards and performance**

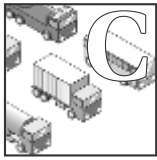
	Works independently to perform duties		Delivers quality work		Delivers consistent and timely results	
	r	p	r	p	r	p
Satisfaction with training and development of employees	r = -.366	p = .004**	r = -.339	p = .008**	r = -.435	p = .001**
Management listens to employees	r = .370	p = .004**	r = .000	p = 1.000	r = -.031	p = .815
Health benefit	r = .047	p = .721	r = -.448	p = .000**	r = -.325	p = .011*
Disability benefit	r = .341	p = .008**	r = -.178	p = .173	r = .089	p = .500
Education assistance for number of kids	r = -.321	p = .013*	r = -.244	p = .060	r = -.367	p = .004**
Family benefit	r = -.315	p = .014*	r = -.329	p = .010*	r = -.472	p = .000**

Note \*\* Correlation is significant at the 0.01 level (2-tailed). r = indicate the direction of the relationship.  
 \* Correlation is significant at the 0.05 level (2-tailed). p = indicate the significance level.



data can also be used.

- Data is collected by employing the simple method of structured questionnaires; other methods could have been used for collecting data.



**ONCLUSION**

Organizations evolve overtime and tend to represent a complex network of institutional, material and manpower resources. Since organizations are set up and managed by people the theme of Human resource development assumes of greater significance. Organizations are as efficient and effective as their people. This aspect of efficiency is composed of three elements: mindset, skills and commitment. Whatever sophisticated measures of productivity of an organization we adopt, when these three measures are represented adequately, the eventual impact on the process and content of optimization may be either nominal or too much disjointed.

As the data analysis part reveals job satisfaction is a crucial

determinant of organizational performance. How organizations measure job satisfaction and employee performance determine futuristic action plans for manpower planning and deployment of managerial and non-managerial staff. In this study it was found that at all levels of staff deployment there is sufficient clarity on organizational goals and nature of work. Moreover, organizational structures are defined according to the certain criteria and government appeared rules of conducting business; so within these structures while there is given vertical relationship between the managers and other levels. While there is satisfaction on the given compensation levels, there is some discrepancy in the response regarding incentives and rewards. Obviously as in any HR policy and practice it is not feasible to design and implement “one size fits all” solution. We may also note that the question of employee satisfaction becomes relatively more important in terms of future streams of benefits including job security. So the level of employee satisfaction is not independent of the anticipated future stream of benefits. The data revealed that there is a positive correlation between the factors of intrinsic rewards and extrinsic rewards of job

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# IMPROVING PRODUCTIVITY USING LEAN SIX-SIGMA

Ayodele Mobolurin, Kamal Agarwal and Mohammad Quasem

## ABSTRACT

*Lean Six-Sigma is usual advocated as a process for quality improvement and productivity is viewed as a by-product of the process. This paper explores the use of Lean Six-Sigma as a methodology for productivity improvement as a major goal. The metrics for success must necessarily incorporate productivity. The paper provides a measurement approach that explicitly targets productivity improvements for the firm while meeting customer demand for quality.*

**Keywords:** *Quality, Productivity Improvement, Six-Sigma, Lean Philosophy*

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## INTRODUCTION

The history of six-sigma as a management strategy launched by Motorola in 1987 is well documented in the literature (Bhote, 1989). Six-Sigma is often identified as a quality program, however its scope is more than the traditional quality program. There are various definitions of six-sigma and definitions that only emphasize prevention of defects, a common aspect of quality management systems causes some of the blurring of the distinction between the two program. It is true that six-sigma is "a program aimed at the near-elimination of defects from every product, process and transaction." (Tomkins, 1997). Tomkins' definition indicates it is not just quality in the traditional sense as the responsibility of a functional area within an organization, but extends to all products, processes and transactions. Therefore six-sigma is a strategic program that must be initiated by top management whose goal is increase customer satisfaction, increase market share, increase productivity and increased profitability, through programs that reduce process variability and reduce product variability from specified limits.

Six-Sigma is recognized by many as an initiative for strategic improvement (Smith, 1992; Harry 1994; Hoerl 1998) now and in the future. Top-management must make it clear that improvement is everyone's job provide appropriate training and infrastructure and give adequate incentives that motivates consistent effort.



### LEAN AND SIX-SIGMA INTEGRATION

Lean Technology started as a method for improving manufacturing operations, but can be extended to all operations of an enterprise from the time the customer places an order till the order is delivered and the company collects cash. Lean philosophy is about removing waste and non-value adding activities from the operations. Bodek (2004) identified seven types of wastes: Inventory; Motion; Transportation; Defects; Delays; Production Miss-match; Processing; Inspection; Excess Cost; Under-Utilization of Talents. Lean implementation requires the evaluation of all activities of the organization with the goal of eliminating wasteful activities. Lean philosophy originated in manufacturing environments, where Toyota was the first company to articulate and formalize the philosophy (Ohno, 1988). The majority of industrial practices identified as lean practices such as reduction of set-up times, reduction of cycle times, Just-In-Time (JIT) continuous flow production techniques, JIT supplier delivery, and small lot sizes are characteristics of a production environment (Jusko, 1999). Although the categories of wasteful activities list above reflects a production or manufacturing orientation, the lean philosophy could be extended into other areas, with the main goal of eliminating any activity that does not create value for the end customer.

Lean and Six-Sigma are complementary approaches (Pyzdek, 2000), because they attack the same enemies from different perspectives, elimination of wasteful expenditure of resources. They can be viewed as two sides of the same coin

and together create a powerful problem solving technology. There is an overlap in the tools for achieving lean production and those for six-sigma. These tools in order to eliminate waste attack the sources of variability in processes

Lean technology is focused on standardization, eliminating waste and variation in work method (process flow and work organization). Six-Sigma's focus is eliminating variation in each piece of work and the process. Six-Sigma complements Lean in facilitating measurements of deviations from work and process standards and provides problem solving techniques to tackle the cost of poor quality and create improvements in productivity.



### PRODUCTIVITY MEASUREMENT

Common thread to Six-Sigma and Lean Technology is the elimination of waste expenditure of resources or achieving more with less. Improved productivity is the result of achieving more with less, therefore the integrated Lean Six-Sigma approach is an indispensable tool for improved productivity. Definition of productivity can be problematic and challenging (Thomas and Barron, 1994; Card, D.N., 2006). A common definition is:

Productivity = (Output.Produced/Resources.Input)

Let us take two different perspectives; a production perspective; and a financial perspective (Thomas and Barron, 1994). For a production performance perspective, suppose firm A produces 100 widgets in a week and the next week produces 120 all inputs remaining the same, then productivity increased by 20%. Suppose the firm has produced 100 widgets in both weeks with the same resource input, however, it sold the widgets for \$1.00 each the first week and \$1.20 the second week. From a production perspective productivity remain the same, but from a financial perspective productivity increased by 20%. Financial productivity focuses on value of the production rather than the quantity of production. Further suppose in week 1 the firm produces 100 widgets and sold them for \$1.20, a revenue of \$120.00 In week 2 the firm produces 120 but the price has dropped by 16.7% to \$1.00 for a total revenue of \$120.00, then from a production performance perspective there is an increased in productivity, but from a financial perspective there is no change.

It is obvious that that measuring productivity can be confusing. Sardina and Vrat (1987) gave 20 definitions of productivity according to Thomas and Barron (1994). The above definition is biased towards the output of the production function and does not adequately recognize other economic and non-economic factors, such as increased market share, and new product introductions and innovation. The definition of the input factors also may not adequately capture all the relevant dimensions. For example labor may be considered as input into the productivity function, but managerial capability as a resource may not be adequately reflected.

In summary according to Sardina and Vrat (1987) productivity

measurements must have three goals " (1) to identify potential improvements; (2) to decide how to reallocate resources; and (3) to determine how well previously established goals have been met." The definition of productivity is also dependent on the level at which productivity is measured and/or it is to be used, whether at the national level (macro-productivity), the organizational business level (micro-productivity), or the sub-organizational level or personal level (nano-productivity), (Thor, 1988). Productivity can be computed at different levels, it will be ideal if the lower level outputs can be directly related as inputs into a higher level output.



**PRODUCTIVITY AND LEAN SIX-SIGMA**

The goal of productivity is doing more with less resource. Achieving this goal in a changing economic environment, with the increasing expectation of customers, complex processes and technologies, and intense competition based on quality and productivity requires the right tools. Lean Six-Sigma provide the tools to actualize the three goals of productivity measurement delineated by Sardina and Vrat (1987). Lean Six-Sigma will highlight defects whose elimination will lead to improvement, provide the information needed to decide how to allocate resources for higher productivity, and provides the tools to determine if the previously targeted improvement goals have been met.

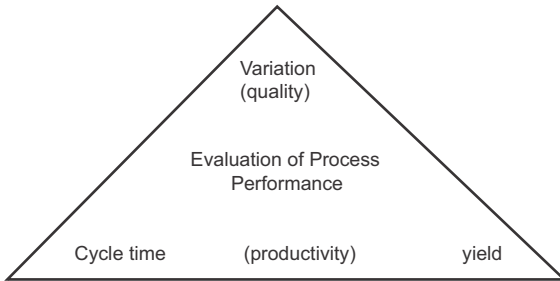


Figure 1 Process Performance Triangle as per Park (2003)



**RELATIONSHIP AMONG VARIATION, QUALITY AND PRODUCTIVITY**

We use Figure 1 developed by Park (2003) to explain productivity and performance can be used to illustrate the three objectives of productivity measurement stated by Sardina and Vrat (1987). Each corner of the triangle is a surrogate for factors to be controlled in achieving targeted improvements. The factors are also related and do influence each other. Reduction of explainable variation will lead to a predictable process, a reduced and controlled cycle time and higher quality. A reduced cycle time will lead to higher yield, which translates into higher productivity. The model achieves the objectives of productivity measurement in the following fashion. The evaluation of process performance leads to identification of sources of wasteful variation (e.g. uncontrolled cycle time) and potential target of process improvements projects for higher quality. Elimination of the variation from target cycle time can provide information on how to reallocate resources for higher yield, which leads to improved productivity.

Productivity is not simply a performance issue. There are other factors related to value which was illustrated earlier in the definition of productivity from a financial perspective. Figure 2 also developed by Park (2003) to illustrate how lean six-sigma improvement projects relates to process performance, provides a complementary explanation of productivity measurement that takes into account other factors that are critical to measuring productivity from other perspective (e.g. financial/value productivity).

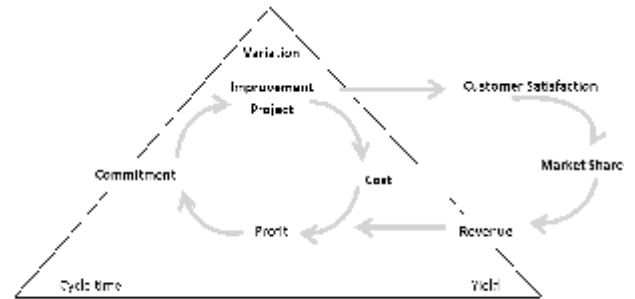


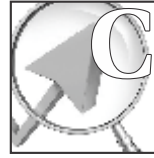
Figure 2 Lean Six-Sigma Connects Quality and Productivity adapted from Park (2003)

Lean Six-Sigma requires top management commitment to eliminating waste and extraneous variations in order to improve quality. This commitment will be evidenced by initiation of lean six-sigma projects supported by adequate training, software and hardware infrastructure. There will be a cost to implementing the Improvement Project and providing the requisite infrastructure (Cost of Quality - COQ consists of Appraisal Cost, Prevention Cost). There is also the Cost of Poor Quality (COPQ) consisting of among other Internal Failure Cost, and External Failure Cost. The Total Cost of Quality is both the COQ and the COPQ (Harrington, 1987). The increase in Appraisal and Prevention Costs should be offset by reduction in the Cost of Poor Quality (COPQ - Internal Failure and External Failure). Most elements comprising the COPQ are hidden while a small portion is visible. This is an iceberg effect which can sink a company without the awareness of an inattentive management. The objective is that COPQ will be reduced to zero and the overall Total COQ (TCOQ) will be lower than when there was no lean six-sigma program.

Explicit recognition of the TCOQ and its potential reduction is an important concept in Lean Six-Sigma implementation and should play a significant role in the selection of improvement projects and the tools used in the improvement project. This is important because a goal of Lean Six-Sigma in the context of this paper is to improve productivity and profitability, therefore all the factors in Figure 2 must be incorporated into the measuring the success of the program. There are other quality improvement methodology or philosophy that do not incorporate all the above factors and therefore may achieve high quality in product and/or process at the expense of profitability/

An integral part of any Improvement Project is the Voice of the Customer (VOC). The VOC identifies the desirable function and features of the product or service and their importance, which is translated into product or service features through Quality Function Deployment (QFD) model. The result of the Improvement Project will reduction in variation from the

targeted product/service performance as obtained through the QFD model. Reduction of variation from the target for customer requirements and the elimination of waste and variation from the process should lead to increased customer satisfaction. Increased customer satisfaction should eventually lead to increased market share, which will result in increased revenue. Of course increased revenue does not necessarily lead to increased profit except there is a corresponding decrease in costs. Increasing revenue with decreasing costs engendered by the Lean Six-Sigma improvement will lead to increasing profit. This improved profit will serve as motivation for sustaining the commitment to the Lean Six-Sigma program.



**CONCLUSION**

This paper has explored the use of Lean Six-Sigma as a methodology for productivity improvement. It took into account the different perspectives of productivity from product performance perspective to the value perspective. It incorporated economic and non-economic factors that impact productivity and explored the relationships between these different factors that are usually not included in the measurement of productivity and provided a roadmap for their measurement.

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**APPENDIX 1**

Computational Example

Sigma Quality Level	Process mean is fixed		Process Mean has a drift of 1.5	
	Non-Defect Rate %	Defect Rate (ppm)	Non-Defect Rate	Defect Rate (ppm)
2	68.26%	31.74%	68.268949	31.731051%
3	69.95.44%	30.85370%	95.449974%	4.550026%
4	93.33930%	6.66070%	99.730020%	.279980%
5	99.37900%	0.62100%	99.993665%	.006335%
6	99.967%	0.0233%	99.999927%	.000063%
6	99.99966%	.000034%	99.9999998%	.0000002%

**APPENDIX 2**

Some Characteristics and meaning related to Lean/Six Sigma:

Defective Rate, Parts per Million (ppm), or Parts per Million Opportunities (DPMO)

Effect of defective rate (i.e. improvement) on Cycle Time, Yield (productivity), Customer Satisfaction, Market Share, Revenue, Profit, Commitment.

Reduction in defects improves yield for the same resources

Reduction in cycle time increases yield for the same input resources

Reduction in defects and incorporation of the VOC (right features at desired target performance) increases customer satisfaction

Improve yield increases quantity available for sale and improved customer satisfaction improves ability to sell more of the increased yield, which improves market share

Increased sales increases revenue

Reduced defectives reduces TCOQ input resources remaining the same.

Profit increases from reduced cost and increases revenue

Commitment to Lean Six-Sigma increases



# CORRELATES OF TECHNOLOGY ORIENTATION, SOCIAL MEDIA USAGE AND ETHICAL DISPOSITION OF GENERATION Y EMPLOYEES IN DELHI NCR

Dr. Puja Khatri<sup>1</sup> & Pragya Gupta<sup>2</sup>

## ABSTRACT

*This paper attempts at studying the frequency and pattern of Social media usage by generation Y workforce; specially focussing on their perceptions regarding allowing the use of social media by the employer. The study was conducted in Delhi NCR region on a sample of select employees from companies in IT, Finance, Consultancy and Education sectors (N=103). Data was collected by administering self-made questionnaire. The study specifically targets those employees who have spent a few years of employment- employees from lower and middle management level. The analysis aimed at investigating varying levels of perceptions between male and female respondents on their technological orientation as well as their ethical disposition.*

*The data analysis focuses on the correlates of perceptions that companies should allow social media usage with actual usage of social*

*media ( $r = 0.576, p < 0.01$ ), awareness of the risks in use of social media ( $r = 0.394, p < 0.01$ ), perceptions of stress if unable to access social media at work ( $r = 0.233, p < 0.05$ ) and hindrance in employee productivity (no relationship found), etc.*

*The paper debunks certain popular myths surrounding the generation Y employees with respect to their technology orientation and workplace characteristics.*

**Keywords :** Work life Policies, Women Executives, Social and Family Problems, Personal Support System, NCR.

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## INTRODUCTION

Globally, the term Generation Y (also popularly known as gen next, iGen, gen Y, millennial, echo boomers, etc.) is used to refer to the demographic cohort, born to parents belonging to Generation X or 'baby boomers'. The Oxford Dictionary refers to the term Generation Y as the generation born in the 1980s and early 1990s, describing predominantly the children of the baby boomers and the ones that are characteristically observed as being inclined towards digital and electronic technology. Nevertheless, it is absolutely mistaken to assume that the generations are equivalent across geographical and cultural boundaries. So, we see West representation of generation X and generation Y par taking almost standard birth dates for the demographic units stretching from 1960s to 1990s. In comparison, China, Japan and South Korea speak of 4-6 generational clusters which have been defined differently and with different names and birth periods during the same time span respectively. In the Indian context, there is no consensus on what really consists of India's generation X and generation Y as these are mere terms to represent youth of country in general; meaning thereby that they are not airtight compartments separated by decades, rather overlapping demographic groups. So it would be over simplistic to assume that gen Y in China or India is equivalent to that of gen Y in the US, Germany or Europe.

As per a study on "Live Births and Birth Rates by Year," (www.infoplease.com), gen Y is considered the most rapidly growing workforce segment; currently making up for almost 25% of workforce all over the world. Recently published study of 2013, "PwC's NextGen: A global generational study" declared that almost 80% of its workforce by 2016 will be comprised of millennials, so it is imperative for the companies (including PwC) to understand the distinctive characteristics of the group and their unique expectations so as to formulate effective systems and processes incorporating their needs, desires and attitudes which successfully engages and motivates them.



## NEED AND RATIONALE

This paper attempts at identifying distinguishing characteristics of Generation Y, their technological preferences and ethical perceptions and also their expectations from their organizations. It is evident from the earlier studies that Generation Y is different than any other generation the world has faced. Their exposure to technology at an early age has given them unique characteristics; collaboration, sharing and learning are the key principles that are imbued in their psyche. Millennials are considered to be tech savvy, use smart phones and find it important to have information available at their fingertips. They believe in multi-tasking and work even while being mobile. As per a recent study by the research firm Millennial Branding and financial giant American Express, although the Generation Y employees are prized for their perceived competence with technology and social media but 47 percent of the bosses surveyed believed that millennial have poor work ethic. This forms the core of our study.

Further the paper examines as to why it is important for the

enterprises to figure out a way to extend the traditional workplace into unconfined work environments; realising the importance of social media in the challenging business environment of today (Mittal, 2012) and also provide social media platforms for their employees. It also attempts to investigate the ethical disposition of the millennial in the light of findings of earlier studies.



## LITERATURE REVIEW

There is considerable deliberation regarding the boundaries of Generation Y. Whatever may be the age range but the advent of Generation Y – individuals born between mid-seventies to end-nineties as a demographic cohort (source: Wikipedia), is the first generation to have been liberally exposed to digital technologies and have effortlessly adopted these technological tools as their primary mode for communication, information gathering and sharing. The literature review aims at studying the important relevant terminology and understands the background and technological bent of the employees.

### Generation Y and its characteristics

The term "Generation Y" first came out in the early 1990s. An editorial of a marketing trade magazine, Advertising Age, has been credited with coining of this term in 1993, as a way to distinguish between the Generation X and Y. There is a lot of variations in the definitions of who comprises of Gen Y. As per Aite group, gen Y is sued to define as individuals born between 1979 and 1990, i.e, between ages 21 and 31. Yet an additional method slots groups of individuals born during overlapping 20-year periods as baby boomers (1945-1965), Gen X (1961-1981) and Gen Y (1979-1999).

Aite Group defines the term as anyone born between 1979 and 1990, or those who are currently between ages 21 and 31. Yet an additional method proposed by Javelin (2012) uses overlapping 20-year periods, such as baby boomers (1945-1965), Gen X (1961-1981) and Gen Y (1979-1999). This puts Gen Y between ages 13 and 33 in 2012.

Avid researchers on Gen Yers, Howe and Strauss (2007) define this group as entitled, sheltered, confident, realists, conventional, time sensitive, and achievement centred. Trunk (2007) talks of dominance of workplace and its mechanisms by the techno-savvy, digitally inclined generation comprising of twenty to thirty year olds. Pekala (2001) in her article on Generation Y found that this generation appears to be deficient in key skills such as listening, communication, independent thinking, time management, team work, job commitment and good work ethic. Multi-tasking being a way of life, Generation Y are simultaneously surfing the web, texting friends, listening to their iPods while also watching TV (Shaw & Fairhurst, 2008); being in touch with personal contacts while doing work (Lewis, 2003).

### Social Media and Generation Y employees

While the terms Social Networking and Social Media are used

interchangeably in the common parlance, there are some fundamental differences between the two. Social media is a way to share information with a broad audience akin to a communication channel like TV, radio, newspaper, etc., whereas social networking essentially is an act of engaging like-minded people having common interests through online community building exercise, so it has a two-way communication. Social media can be defined as “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, which allows the creation and exchange of user-generated content” (Kaplan & Haenlin, 2010). It is a web-based tool that is optimized solely by the use of its public.

The life of a Gen Yer seem to have been colossally impacted by social media. Interestingly, Derek Vicente (2012) placed the importance of social media just above the physiological needs in relation to Maslow's Basic Hierarchy of Need. Lenhart (2009) further argued that social networks are primarily used for establishing and maintaining personal or professional contacts, making plans such as by organizing an event or a cause, and simply flirting. It is but imperative for the organizations to stop disregarding the evolution of social media and its infiltration in the workplace, considering that in order to retain the young workforce the companies need to acclimatise to the new trends and social media wave.

Social networks like Facebook, Twitter, LinkedIn, MySpace, YouTube, etc. have found ardent takers in the form of the new workforce who have grown up using these social tools and expect it to be available at the workplace too. The new age workforce utilise these tools effectively to enhance their awareness by filling the gaps in their current level of knowledge; further to disseminate and collect information as well as to collaborate with virtual teams in real time. Their preference is to have strong networking relationships with their colleagues, both within their team and those located across the world so as to collaborate and communicate; the world to them is a global village. It has been often concluded that the attention span of generation Y is low and because of their focus in multiple things outside their work realm, there is great chance of loss of productivity (Mittal, 2012). According to a 2011 study conducted by harmon.ie, a social email software provider, \$10,375 in productivity is wasted each year by a typical employee using social media sites.

Most importantly the younger workforce looks at social business as the way forward and favours working for those companies who have adopted enterprise social collaboration tools for their daily operations. Prof. Eisner (2005) in her paper “Managing Generation Y” declares that Gen Y was socialized in a socially wired world, which is more than being technically literate – it means remaining continually underwired, plugged in, and connected to digitally streaming information, online entertainment, and virtual contacts. A late 2012 survey by the Pew Research Centre's Internet & American Life Project shows that in the USA alone, an average generation Yersends and receives around 88 texts a day and 70% check their phones every hour. As cited by Eisner (2005), Weiss (2003) went up to the extent in saying that Gen Y tends to consume more hours of

social media, through multi-tasking, than there are actual hours in the day.

### Ethics and Generation Y

Ethics and morality are often used interchangeably, but they don't have the same meaning. Eisner in her 2005 article mentioned that Stout and Weiss (2003) have described morality as a value system consisting of standards that define good versus bad, right versus wrong, whereas ethics is the application of these moral principles through decisions and actions. Miller et al (2002) defines work ethics as a set of beliefs and attitudes reflecting the fundamental value of work.

A recent research by Ethics Resource centre (NBES, 2011) examined the difference in attitudes towards ethical issues among the four generational groups – Traditional, Boomers, Gen X and Millennials. The study concluded that the youngest workers are significantly more likely than their older colleagues to break ethical rules. Millennial observed a whopping 49% of workplace misconduct such as “personal business on company time”, “lying to employees”, “abusive behaviour”, “company resource misuse” and “discrimination”. Another alarming finding which was revealed through the study was that the extensive use of social networking pose severe challenges as significant number of Millennial post questionable information such as “Feeling about their jobs”, “Bad joke told by Boss”, “work on a project”, “Picture of a co-worker drinking”, annoying habit of a co-worker”, “Opinion about a co-worker's politics”, etc.

In the modern scenario, money seems to be overruling everything. Gen Y has placed unrealistically high expectations towards their chosen careers, thus causing laziness and a lack of ethics, moral values and emotional intelligence amongst the Gen Y that have joined the competitive workforce (Thurasingham & Sivanandam, 2012). Hansen (2011) believed that Gen Y possesses poor work ethics as they consider no difference between work and life, both being seamless. Generation Y prefers work to be fun and flexible because work is the means to enjoy life. Furthermore, Boyd (2010) affirms that Gen Y sees no manipulative implications in its unethical or unconventional methods because “everybody” engages in these tactics to secure a job. It thus makes sense that gen Y is stringent about having work life balance; for them time is a valuable resource which they like to fill with all of their varied interests, projects, hobbies, families, and volunteering. Although they are prepared to put in hard work but it occupies only one slot in their lives; so they do not want to waste time as they find it a limited resource.

Looking at the sparse availability of literature in this area, the present study attempts to empirically explore the perceptions of Generation Y employees regarding the use of social media at work and their ethical disposition.



### RESEARCH QUESTIONS

This research aims to answer the following research questions and critically analyse the popular notions regarding generation Y



workforce:

- To study the usage and frequency of use of social media in the Indian workplace milieu
- To understand the perception of generation Y employees regarding acceptance and importance of social media in their lives
- Comprehend the role of Social media in its impact on generation Y employees
- To study the perceptions of generation Y employees regarding work ethics
- To analyse the challenges and opportunities faced by the organizations with respect to usage of social media; for effective management of generation Y employees



### YPOTHESES

Based on the above research questions and literature review, the study attempts to test the following null and alternate hypotheses:

H<sub>01</sub>: There exists no significant gender-based difference in generation Y employees as regards the use of Social Media

H<sub>a1</sub>: There exists a significant gender-based difference in generation Y employees as regards the use of Social Media

H<sub>02</sub>: There exists no significant gender-based difference in generation Y employees as regards their ethical disposition.

H<sub>a2</sub>: There exists a significant gender-based difference in generation Y employees as regards their ethical disposition.

H<sub>03</sub>: There exists no significant relationship between the perceptions of generation Y employees regarding the permission given by companies to use social media and actual usage of social media

H<sub>a3</sub>: There exists a significant relationship between the perceptions of generation Y employees regarding the permission given by companies to use social media and actual usage of social media

H<sub>04</sub>: There exists no significant relationship between the perceptions of generation Y employees in terms of social media usage as a stress buster and the permission given by companies to use social media

H<sub>a4</sub>: There exists a significant relationship between the perceptions of generation Y employees in terms of social media usage as a stress buster and the permission given by companies to use social media

H<sub>05</sub>: There exists no significant relationship between awareness of risks pertaining to use of social media and actual usage of social media.

H<sub>a5</sub>: There exists a significant relationship between awareness of risks pertaining to use of social media and actual usage of social media.

H<sub>06</sub>: There exists no significant relationship between the usage of Social Media at workplace and lack of productivity among the employees of the companies that permit use of social media.

H<sub>a6</sub>: There exists a significant relationship between the usage of Social Media at workplace and lack of productivity among the employees of the companies that permit use of social media.



### RESEARCH METHODOLOGY

This research initiative studies the perceptions of generation Y employees in the Delhi NCR region regarding the usage of social media in their workplace. It also tries to probe into differences in perceptions based on gender as regards their ethical disposition.

A comprehensive questionnaire of 40 items was developed for data collection on the topic of study. Part A of the instrument was purely focused on collecting demographic details while Part B mapped the perceptions of respondents as regards their technology orientation and social media usage and their ethical disposition. The questionnaire consisted of questions based on following measures:

- Demographic information such as age, gender, general education level, sector, etc.
- Self-designed questions on the tech-savviness of generation Y and their social media behaviour comprising of extent and frequency of social media usage, interactive and collaborative usage of social media, etc.
- Self-designed questions on the ethical disposition of generation Y

The questions were rated on Likert scale of five points ranging from 1 to 5 with 5 being the highest level of response (strongly agree) and 1 being the lowest (strongly disagree). Reliability of the self-constructed questionnaire was tested to be Cronbach alpha 0.91. According to Nunnally (1978) the instruments used in basic research have reliability of about 0.70 or better.

The target population was a selection of 10 employees in select three companies each across four industry sectors viz., IT, Finance (Insurance and Banking), Consultancy and Education. Researcher contacted HR Managers of all these companies and was handed over the coordinates of 5 employees from Lower management and 5 from middle management level. Finally out of 120 solicited participation numbers, 103 complete responses were received and utilised for the analysis, an 85% response rate.



### DATA ANALYSIS

The first section of the questionnaire collected the demographic information of the respondents including gender, age, employment history and the industry segment and also their social networking habits.

### Demographics

The sample profile of the respondents was 68% male and 32% female. The age of the participants indicated that 39.8% were between the ages 25 to 30 years and 36.9% were between 30 to 35 years. The rest of 11.7% population each were less than 25 years and more than 35 years respectively. This essentially captures almost 77% of Generation Y that has been in the workforce longest and must have been able to respond based on their experiences. With respect to employment history, approx. 49.5% are on their first job only, whereas 24.3% are on their second job and 26.2% have already switched multiple jobs. The percentage of respondents from IT, Finance (Insurance and Banking), Education and Consultancy were 39.8%, 28.2%, 18.4% and 13.6% respectively.

### General Social media usage

The responses showed that 45.6% of respondents used Social Media for personal use only and a meagre 8.7% use it only for business purposes. On the other hand, a substantial 43.7% of participants confirmed the use of social media for both personal and business reasons. About 38.8% respondents

affiliations were YouTube, Picasa, Google+, etc.

### Data Analysis and Discussions

The analysis began with testing hypothesis H01 with application of Levene's t-test for equality of variances (Table 1 (a) and 1(b)). The results of t-test data reveals that there exists a difference in the male and female respondents as regards having multiple social media membership ( $t = -2.007, p < 0.05$ ). The female respondents ( $m = 4.36, s.d. = 0.60$ ) score higher than male respondents ( $m = 3.9, s.d. = 1.26$ ). This finding is in line with Tüfekçi, 2008 study (cited by Mazma & Usluwel, 2011); which shows significant differences between males and females on the usage of social networks that females are more likely to use social networks to keep in touch with friends than the males. Although it contrasts the findings of study by Thelwall (2008) and Lenhart & Madden (2007) found that males tend to make new relationship in social network environments more than females do.

No difference between male and female respondents was found with respect to presence on multiple social media sites ( $t = 0.061, p < 0.05$ ), inclination to freely share/ access content

**Table 1 (a): Group Statistics: Social Media usage among Male and Female employees**

	Gender	N	Mean	Std. Dev.	Std. Error Mean
Multiple social media membership	Male	70	3.9	1.26	0.15
	Female	33	4.36	0.60	0.11
Presence on more than one social media	Male	70	3.68	1.11	0.13
	Female	33	3.67	1.16	0.20
Freely share and access content on social media	Male	70	3.46	1.17	0.14
	Female	33	3.39	1.14	0.20
Adept to basic fundamentals of usage of social media	Male	70	3.8	0.82	0.10
	Female	33	3.82	0.68	0.12
Risk awareness pertaining to social media	Male	70	3.8	0.96	0.12
	Female	33	3.73	0.88	0.15
Use of social media for 25% of time daily	Male	70	2.33	1.08	0.13
	Female	33	2.58	1.23	0.21
Measurement of popularity in virtual friend circle	Male	70	2.84	1.27	0.15
	Female	33	2.97	1.29	0.22
Stress when unable to access Social Media	Male	70	2.75	1.28	0.15
	Female	33	2.55	1.00	0.18
Use of online access to attend to daily utility requirements	Male	70	4.26	0.90	0.11
	Female	33	3.36	1.43	0.25
Company should allow employees to use Social Media at work	Male	70	3.33	1.43	0.17
	Female	33	3.52	1.20	0.21
Seek a job through the social media	Male	70	3.43	1.35	0.16
	Female	33	3.58	1.42	0.25
Loss of productivity due to over-indulgence in Social Media	Male	70	3.19	1.38	0.17
	Female	33	3.01	1.23	0.21
Preference of latest laptops and gadgets to work better and faster	Male	70	4.23	1.00	0.12
	Female	33	3.97	1.24	0.22

reported spending between 30 minutes- 1 hour daily on accessing social media and another 31.1% reported spending between 1-2 hours daily. 15.5% confirmed spending 2-3 hours daily, whereas 6.8% reported remaining online round the clock. As per data, 30.1% confirmed their affiliation with at least one Social networking site, 29.1% were associated with two sites and 27.2% confirmed their active memberships with at least three social media sites. Of all the respondents, almost 99.8% established their presence on the extremely popular facebook and 59.2% admitted to their existence on the business social networking site – LinkedIn. The other popular

on social media ( $t = 0.284, p < 0.05$ ), interest in postings made by others ( $t = -0.341, p < 0.05$ ), adept at basics of social media usage ( $t = -0.129, p < 0.05$ ), measurement of popularity in virtual world ( $t = -0.479, p < 0.05$ ), extensive use of social media for 25% of waking hours ( $t = -1.015, p < 0.05$ ), seek a job through social media ( $t = -0.487, p < 0.05$ ), preference of online methods of training ( $t = 0.221, p < 0.05$ ) and preference for latest gadgets ( $t = 1.144, p < 0.05$ ).

However, a significant difference was found in the male and female respondents regarding their comfort in attending to

daily utility requirements such as bill pay, bank access, trip arrangements, vacation planning through online access ( $t = 3.855, p < 0.05$ ). Male respondents ( $m = 4.26, s.d. = 0.90$ ) are more comfortable in using web for daily utility requirements than their female counterparts ( $m = 3.36, s.d. = 1.43$ ). This clearly depicts that although females fare higher than males regarding owning multiple social media membership, yet they seem to be hesitant in using technology in money-based transactions. This essentially meaning the males are perceived to be far more tech-savvy than the females although the latter

seem to enjoy their presence on multiple social media sites.

Looking at the above, it can be concluded that the data inference does not completely support this assumption that there is a significant difference in the perceptions of male and female employees towards usage of social media. On some accounts it displayed difference but on most accounts it did not show any difference in perceptions based on gender. So, our null hypothesis  $H_{01}$  gets partially accepted.

**Table 1 (b): Independent Samples Test for gender-based differences regarding Social Media usage**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Conf. Interval of the Diff.	
									Lower	Upper
<b>Multiple social media membership</b>	Equal var. assumed	5.726	0.019	-2.007	100	0.047	-0.465	0.232	-0.925	-0.005
	Equal var. not assumed			-2.519	100	0.013	-0.465	0.185	-0.831	-0.009
<b>Presence on more than one social media site</b>	Equal var. assumed	1.033	0.312	0.061	100	0.952	0.014	0.238	-0.457	-0.486
	Equal var. not assumed			0.060	60.3	0.953	0.014	0.242	-0.470	0.499
<b>Freely share and access content on social media</b>	Equal var. assumed	0.012	0.911	0.284	100	0.777	0.070	0.246	-0.418	0.558
	Equal var. not assumed			0.286	64.5	0.776	0.070	0.244	-0.417	0.577
<b>Risk awareness pertaining to social media</b>	Equal var. assumed	0.252	0.617	0.352	100	0.725	0.070	0.198	-0.323	0.463
	Equal var. not assumed			0.364	68.9	0.717	0.070	0.192	-0.312	0.452
<b>Stress when unable to access Social media</b>	Equal var. assumed	5.419	0.022	0.823	100	0.413	0.208	0.253	-0.294	0.710
	Equal var. not assumed			0.895	78.6	0.373	0.208	0.233	-0.255	0.671
<b>Use of online access to attend to daily utility requirements</b>	Equal var. assumed	22.391	0.000	3.855	100	0.000	0.897	0.233	0.435	1.359
	Equal var. not assumed			3.300	44.5	0.002	0.897	0.272	0.349	1.445
<b>Company should allow employees to use Social Media at work</b>	Equal var. assumed	4.045	0.047	-0.631	100	0.530	-0.182	0.288	-0.754	0.390
	Equal var. not assumed			0.671	74.1	0.504	-0.182	0.271	-0.722	0.358
<b>Seek a job through the social media</b>	Equal var. assumed	0.045	0.832	-0.487	100	0.627	-0.141	0.289	-0.715	0.433
	Equal var. not assumed			-0.478	60.3	0.634	-0.141	0.295	-0.730	0.449
<b>Loss of productivity due to over-indulgence in Social Media</b>	Equal var. assumed	2.564	0.112	0.670	100	0.504	0.188	0.281	-0.370	0.746
	Equal var. not assumed			0.698	70.2	0.487	0.188	0.270	-0.350	0.727
<b>Preference of latest laptops and gadgets to work better and faster</b>	Equal var. assumed	1.163	0.283	1.144	100.0	0.255	0.262	0.229	-0.193	0.717
	Equal var. not assumed			1.062	52.8	0.293	0.262	0.247	-0.233	0.757

A second t-test was carried out to compare the gender wise difference between perceptions of generation Y employees towards ethical behaviour at work. The data findings in table 2(a) and 2 (b) were used to test the hypothesis H02.

It was found that there exists a significant difference in the perceptions of male and female generation Y employees with respect to the belief that one should bring no physical or psychological harm to others ( $t = -1.813, p < 0.05$ ). As table 2(a) shows that females ( $m = 4.58, s.d. = 0.79$ ) score higher than the males ( $m = 4.23, s.d. = 0.94$ ). One explanation that is used to explain this difference in the perceptions is the diverse socialization of males and females, with men taught to emphasize competition and women taught to emphasize social relationships (Beutell & Brenner, 1986). Women by their basic nature are perceived to be softer and empathetic towards their fellow beings and this is clearly visible in our study. Furthermore, males ( $m = 3.49, s.d. = 1.17$ ) were observed to score lesser than female respondents ( $m = 1.06, s.d. = 0.9$ ) on the question that whether they feel that moral standards are simply personal rules that indicate how a person should behave and are not to be applied in making judgments of others ( $t = -2.458, p < 0.05$ ). The reason of this could be that

women are more compassionate and have respect for others than their counterparts; they do not impose their viewpoints and this could be because they are better socialized.

Likewise, significant difference was found in the perceptions of males ( $m = 3.55, s.d. = 1.06$ ) and females ( $m = 3.94, s.d. = 0.75$ ) regarding their belief that a lie can be judged to be moral or immoral depending on the circumstances surrounding the action ( $t = -1.874, p < 0.05$ ). This finding is in sync with the above observation as women are not judgmental about the actions of others and are not quick in labelling other individuals as liars; they are ready to give others leeway in terms of justifying their activities based on circumstances.

However no difference was found in the perceptions of male and female respondents as regards their ethical and moral idealism in the following questions: "My actions never intentionally harm others" ( $t = -0.047, p < 0.05$ ); "No risks to others, however small" ( $t = -1.813, p < 0.05$ ); "refrain from any action which may harm an innocent person" ( $t = -1.031, p < 0.05$ ); "Dignity and welfare of people is the most important concern of the society" ( $t = -1.512, p < 0.05$ ), "No ethical principles are so important as to be a part of any code of ethics"

( $t = 0.081, p < 0.05$ ), “Believe what is ethical varies from one situation and society to another” ( $t = 0.877, p < 0.05$ ), “Moral standards are individualistic, i.e., what one person considers

to be moral may be judged as immoral by another” ( $t = -0.092, p < 0.05$ ), and “Different types of morality cannot be compared as to “rightness” ( $t = -0.793, p < 0.05$ ).

**Table 2 (a): Group statistics: Ethical disposition of Male and Female employees**

	Gender	N	Mean	Std. Dev.	Std. Error Mean
My actions never intentionally harm others	Male	70	4.48	0.70	0.08
	Female	33	4.48	0.57	0.10
Believe that one should not physically or psychologically harms others	Male	70	4.23	0.94	0.11
	Female	33	4.58	0.79	0.14
Feel that there should not be any risks to others, however small	Male	70	4.03	1.08	0.13
	Female	33	4.36	0.78	0.14
Refrain from an action which might harm an innocent person	Male	70	4.22	1.04	0.13
	Female	33	4.42	0.71	0.12
Dignity and welfare of people is the most important concern in the society	Male	70	4.35	0.98	0.12
	Female	33	4.64	0.70	0.12
Deciding whether or not to perform an act by balancing the positives against the negative consequences of the act is immoral	Male	66	3.58	1.16	0.14
	Female	32	3.53	1.02	0.21
No ethical principles are so important as to be a part of any code of ethics	Male	66	3.33	1.19	0.15
	Female	32	3.31	1.18	0.21
Believe what is ethical varies from one situation and society to another	Male	69	3.96	1.12	0.13
	Female	33	3.76	0.97	0.17
Moral standards are individualistic, i.e., what one person considers to be moral may be judged as immoral by another	Male	69	4.04	0.95	0.11
	Female	33	4.06	0.70	0.12
Different types of morality cannot be compared as to “rightness”	Male	67	3.75	1.04	0.13
	Female	33	3.91	0.81	0.14
Moral standards are simply personal rules that indicate how a person should behave and are not to be applied in making judgments of others	Male	69	3.91	0.81	0.14
	Female	33	4.06	0.90	0.16
Believe that a lie can be judged to be moral or immoral depending on the circumstances surrounding the action	Male	67	3.55	1.06	0.13
	Female	33	3.94	0.75	0.13

**Table 2 (b): Independent samples test for gender-based differences regarding Ethical disposition**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Conf. Interval of the Diff.	
									Lower	Upper
My actions never intentionally harm others	Equal var. assumed	1.373	0.243	-0.05	100	0.962	-0.007	0.14	-0.28	-0.27
	Equal var. not assumed			-0.05	76.57	0.96	-0.007	0.13	-0.27	-0.251
Believe that one should not physically or psychologically harms others	Equal var. assumed	2.092	0.151	-1.81	100	0.073	0.344	0.19	-0.72	-0.033
	Equal var. not assumed			-1.93	74	0.048	-0.344	0.178	-0.7	0.012
There should not be any risks to others, however small	Equal var. assumed	2.196	0.141	-1.58	100	0.116	-0.335	0.211	-0.75	0.084
	Equal var. not assumed			-1.77	84.23	0.08	-0.335	0.189	-0.7	0.041
Refrain from an action which might harm an innocent person	Equal var. assumed	3.535	0.063	-1.03	100	0.305	-0.207	0.201	-0.61	-0.191
	Equal var. not assumed			-1.18	88.06	0.243	-0.207	0.176	-0.56	0.143
Dignity and welfare of people is the most important concern in the society	Equal var. assumed	4.418	0.038	-1.51	100	0.134	-0.289	0.191	-0.67	0.09
	Equal var. not assumed			-1.7	85.24	0.093	-0.289	0.17	-0.63	0.049
Deciding whether or not to perform an act by balancing the positives against the negative consequences of the act is immoral	Equal var. assumed	0.979	0.325	0.185	96	0.854	0.045	0.241	-0.43	0.523
	Equal var. not assumed			0.194	69.62	0.847	0.045	0.23	-0.41	0.503
No ethical principles are so important as to be a part of any code of ethics	Equal var. assumed	0.277	0.6	0.081	96	0.935	0.021	0.256	-0.49	0.529
	Equal var. not assumed			0.082	62.31	0.935	0.021	0.255	-0.49	0.53
Believe what is ethical varies from one situation and society to another	Equal var. assumed	1.785	0.185	0.877	100	0.383	0.199	0.227	-0.25	0.649
	Equal var. not assumed			0.922	71.92	0.36	0.199	0.216	-0.23	0.629
Moral standards are individualistic, i.e., what one person considers to be moral may be judged as immoral by another	Equal var. assumed	0.875	0.352	-0.09	100	0.927	-0.017	0.185	-0.39	-0.351
	Equal var. not assumed			-0.1	82.23	0.919	-0.017	0.167	-0.35	0.316
Different types of morality cannot be compared as to “rightness”	Equal var. assumed	2.829	0.096	-0.79	98	0.43	-0.163	0.205	-0.57	0.245
	Equal var. not assumed			-0.86	79.71	0.391	-0.163	0.189	-0.54	0.213
Moral standards are simply personal rules that indicate how a person should behave and are not to be applied in making judgments of others	Equal var. assumed	4.35	0.04	-2.46	100	0.016	-0.568	0.231	-1.03	-0.11
	Equal var. not assumed			-2.7	80.14	0.009	-0.57	0.211	-0.99	0.15
Believe that a lie can be judged to be moral or immoral depending on the circumstances surrounding the action	Equal var. assumed	8.003	0.006	-1.87	98	0.064	-0.38	0.207	-0.8	0.023
	Equal var. not assumed			-2.11	86.08	0.038	-0.387	0.184	-0.75	-0.02

This is in contrast to the earlier findings of Smith, Davy and Rosenberg (2009) who had developed and tested a theoretical model on the differences in the behaviour of women and men in their willingness to behave in unethical or immoral ways, with women being more ethical and less likely to be political. Becker and Ulstad (2007) in their study on Gender Differences in Student Ethics, did find significant differences in males and females. Although our data analysis did exhibit differences in perceptions in a few areas but no difference in most of others. It becomes clear thus that the data analysis does not completely support the hypothesis that significant differences exist in the perceptions of male and female generation Y employees with respect to their moral and ethical disposition. This leads us to the conclusion that H<sub>02</sub> is supported by the findings of the data.

Pearson moment's correlation was used to evaluate the perceptions of employees that companies should allow social media usage and the actual social media usage. Table 3 shows a significantly high positive relationship between the two; thereby depicting that those people who are pro for allowing social media in companies themselves display a considerably high usage of social media. This means that the individuals who are high on use of social media expect their organizations to fulfill their need for collaboration, instant gratification and multi-channel connection with the outside world (Mittal, 2012). Soumi Rai (2012) in her study on Indian Generation Y contends that it is imperative need for a focus on integrating the expectations of Generation Y employees towards their work organizations (which is viewed by them as an extension of their social life), to their psychological needs of expression and acceptance through collaborating on Social Media platforms and connecting to the outside world. This connectivity is the lifeline of Millennial which allows them to share, collaborate and grow. So, the null hypothesis H<sub>03</sub> that there is no significant relationship between the perceptions of generation Y employees regarding the permission given by companies to use social media and actual usage of social media is rejected.

**Table 3: Correlations of perceptions that companies should allow Social media usage and Social Media usage**

		Companies should allow Social media usage	Social Media usage
Companies should allow Social media usage	Pearson Correlation	1	.576**
	Sig. (2-tailed)		0
	N	103	103
Social media usage allow Social media usage	Pearson Correlation	.576**	1
	Sig. (2-tailed)	0	0
	N	103	103

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

Furthermore, correlation data in table 4 shows existence of a relatively weak relationship ( $r = 0.233$ ,  $p = 0.05$ ) between perceptions that inability to use social media causes distress among employees and therefore the companies should allow social media usage. As Mittal (2012) puts it in his study on Infosys employees in Bangalore (India), the enterprises today need to understand the characteristics of a digital workforce –

the criticality for the employees to have collaboration, sharing and connect with the outside world. Its non-existence may cause disconnect and ultimately may result in its disengagement with the organization. This brings us to accept our fourth null hypothesis H<sub>04</sub> that there exists no significant relationship between the perceptions of generation Y employees in terms of use of social media at work acting as a stress buster and its usage allowed at work, although the relationship is rather weak yet positive and significant at  $p \leq 0.05$ .

**Table 4: Correlations of perceptions that companies should allow Social Media usage and Inability to use Social Media leads to distress**

		Companies should allow Social media usage	Inability to use Social Media causes stress
Companies should allow Social media usage	Pearson Correlation	1	.233*
	Sig. (2-tailed)		0.017
	N	103	103
Inability to use Social media causes stress	Pearson Correlation	.233*	1
	Sig. (2-tailed)	0.017	0
	N	103	103

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

Pearson's correlation was applied to further assess the relationship of awareness of risks pertaining to social media and the actual usage of social media by such employees (Table 5). The relationship was found to be positive and significant ( $r = 0.394$ ,  $p = 0.01$ ); which implies that generation Y are risk-taking individuals and despite being aware of the risks pertaining to social media they tend to have greater social media usage. This is in contrast with our hypothesis that greater the awareness of risks pertaining to use of social media, lower would be its usage. Hence H<sub>05</sub> gets rejected as our data findings show a positive and significant relation between awareness of risks related to use of social media and its actual usage by generation Y.

**Table 5: Correlations of perceptions of awareness of risks pertaining to Social Media and actual Social Media usage**

		Social media usage	Inability to use Social Media causes stress
Social media usage	Pearson Correlation	1	.394**
	Sig. (2-tailed)		0
	N	103	103
Awareness of risks pertaining to Social media	Pearson Correlation	.394**	1
	Sig. (2-tailed)	0	
	N	103	103

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

Data findings in Table 6 shows no relationship between the perceptions that the companies that allow usage of social media faces a loss of productivity in its employees ( $r = -0.066$ ,  $p = 0.01$ ). This is in contrast with the study by Mittal (2012), who has asserted that social media being appealing may entice employees to while away their time in unproductive chatting

with colleagues and friends in and outside their organization. In addition, they may inadvertently put their organization at risk if they connect to social network in public places. This is in sync with the findings of this study, so our null hypothesis  $H_{06}$  gets accepted as no significant relationship was found between lack of productivity due to over-indulgence in Social Media.

**Table 6: Correlations of perceptions that companies should allow Social media usage and overindulgence in Social media hampers productivity**

		Companies should allow Social media usage	Over indulgence in Social media hampers productivity
Companies should allow Social media usage	Pearson Correlation	1	-0.066
	Sig. (2-tailed)		0.503
	N	103	103
Over indulgence in Social media hampers productivity	Pearson Correlation	-0.066	1
	Sig. (2-tailed)	0.503	
	N	103	103



#### CONCLUSIONS AND IMPLICATIONS:

It can be easily noted that the intensely socially-networked youth of today live their lives with a transparency that is disconcerting. They have grown up with computers, abundant internet access and a range of web-based applications; it is challenging for the organizations to manage the expectations of this tech savvy generation. Only those organizations that understand the needs of generation Y of having instant gratification, collaboration and learning would do well. Hence, it is essential for the companies to understand the significance of social media in the lives of their young workforce and cater to it appropriately.

This study however, found no significant relationship between the perceptions of use of social media by generation Y and loss of productivity or the awareness of risks related to use of social media or that lack of inability to social media causes stress. Still, it cannot be denied that the organizations are in dire need of having an effective Social media policy incorporating people, process and technology framework as the ground reality might still be different. The issues like threats to leaking of an enterprise's proprietary information, choking of bandwidth by downloading heavy files, loss of productivity due to overindulgence in social media, etc. Organizations must identify social media risks (Mittal, 2012), create a special social media cell and a social media risk management program to form effective policies and governance model to check the levels of access and content type they would allow their employees to access.

As the study by Silkroad Technology (2012) rightly puts forth, the companies ought to recognise the importance of “the impact of social media on business agility, the proliferation of innovative social applications for industry, and the bright spotlight on worker productivity and social technology” as they tackle their approach towards social media.



#### LIMITATIONS

The sample for the study included respondents belonging to the northern part of India as the study was based in Delhi-NCR which is a cosmopolitan city based in North India. It may be worthwhile to capture the perceptions, views, behaviours and attitudes of generation Y in other parts of India, especially in tier II and tier III cities. So, future research could be carried out taking into account the geographical diversity to make the research more comprehensive and may even show more authenticated results.

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# Emerging Trends in System Software Market: A Case Study of Operating System Software

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## ABSTRACT

Information Technology has evolved over a period of time from Electronic Data Processors (EDP) to Cloud based technologies. Software is a critical component in this industry. The core product component in software is the set of instructions in the form of source code. During inception of the industry, source code was accessible at no cost. In the next era of information technology (1970's & 1980's), programs which were earlier available free of cost were sold at a price through licensing. During mid and early 1980's open source and hardware integrated software emerged. Similar trend was visible in system software market, especially in the operating system software market. Over a period of time Microsoft operating system emerged as one of the dominant players in the market. However, in the recent past Microsoft has considerably lost its market share in operating system products from 94.38% in June 2007 to 84% in May 2014. This paper captures the trend in operating system software market and analyses customers' preference to switch over from the current operating system. The trend in the market was analyzed through secondary data on market share and the customer preference to switch over was captured through a survey of engineers at various multinational IT firms in Bangalore. The study identified that the current trend could be moving towards open source or hardware integrated operating system from proprietary operating software. The survey identified that higher percentage of users preferred to switch over from the current operating system on desktops, laptops and workstations to either open source or hardware integrated operating system except servers.

**Keywords :** Open Source Applications, Operating System Products, Linux products, Business Model of Operating System

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## INTRODUCTION

Operating system (OS) is one of the critical system software. The major players in operating system market are Microsoft, Linux and Apple Mac. These three players represent three different business models. Microsoft Windows™ is proprietary software, Linux is open source software and Apple's Mac OS™ is hardware integrated software. Under Desktop category, Microsoft Windows™ and Mac OS™ are the major players. In server category, it is mostly Microsoft Windows™ and Linux. Mac OS™ presence in this category is very less.

Microsoft Windows™ is a license based operating system, Apple Mac OS™ is also license based operating system, but it is hardware integrated operating system. Mac OS™ is compatible with only Apple computers. Linux is open source code based operating system. A community of users develops and tests the code. A set of distributors download the OS code and sell the code as a package to users under various versions. A few of the major distributors are Redhat, Fedora, Suse, and Ubuntu. ([www.linux.com](http://www.linux.com)).

Microsoft Windows™ operating system was a dominant player in the operating system software market. However, in the recent past Microsoft Windows™ has considerably lost its market share in operating system products from 94.38% in June 2007 to 84% in May 2014. The decreasing market share of Microsoft Windows™ could be because of its lack of technological edge in today's technology-driven industry. The present cloud in IT prefers Google™ to Microsoft (Hahn and Passell, 2008). Microsoft has also been under scrutiny by customers for its security of its products. Jaikumar (2008) stresses that there is a need to change the perception of customers about the security feature of Microsoft operating system products. Secured application has become the major concern for customers of Windows™ operating system product. The feature referred as Spaces in Mac OS™ provides flexibility of switching between Mac OS™ and Windows™ flexibility in terms of platform independent hardware or software. In addition to this flexibility, the software development kit for iPhone™ and other innovative features offered with Mac OS™ has made customers prefer Mac OS™ over Windows™. The acceptance level of Mac OS™ is growing, meanwhile the acceptance level of Windows™ is on the downward trends since Mac OS™ provide effective and efficient solution in place of many hard-to-use features in Windows™ (Morgenthaler, 2008). The customer would like to buy a product which would be compatible with the existing hardware or software. This feature will help organisation to create customer value and results in shift over of customer base from its competitors.

Bonaccorsi et al. (2004) provide an insight into the growth of organizations that use Open Source Software (OSS). The data was collected from 275 companies out of which 146 companies were able to provide valid answers. It was noticed that the average growth of turnover was around 121.3%. Further analysis identified that the organizations that use only OSS have slower growth as compared to the organization

which use the combination of OSS and proprietary software. These organizations used hybrid business models. However, hybrid business model has significant challenge under general public license. The analysis on using OSS for production and the impact of network externalities were done. This research identified that hybrid business model produces better results and growth. The study identifies that the perception, acceptance level and awareness of OSS are some of the key elements in a business model.

Krishnamurthy (2003) opines that the industry trend is moving towards open source business models. He analyzed the business models existing in the open source software and indicates that open source software provides more flexibility and reliability for organization due to which users may prefer to buy open source software. Baseman, et al. (1995) is of the opinion that Microsoft has erected barriers of entries through pricing and non-compatibility techniques. Due to these factors Microsoft is able to dominate the market as compared to other players. One of the important features in operating system product is the factor of compatibility. It implies that operating system will have the flexibility to support multiple platform based hardware or software applications. However, the concept of lock-in is prevalent in the industry due to the compatibility factor. Lock-in for either customers or vendors is defined as the situation where a customer is dependent on a vendor for products and services and (s)he is unable to use another vendor without a significant switching cost. Switching costs place a financial constraint on the customers who intends to switch brands or suppliers. Therefore, the industry with significant switching cost generally might have forced customer loyalty. Customer lock-in adds significant value to a company's strategy (Joachim, 2004). Customer lock-in is a significant factor in the operating system market, since it is directly related to the features of compatibility and flexibility. A few years back Apple released Mac Mini™, a low priced Macintosh computer, at a cost of \$499. It has hardware compatibility with other brands. This compatibility has resulted in low switching cost for customers. This might impact the lock-in of Microsoft customer base. All these developments make customer lock-in a vital component of the value chain in business model. In one of the studies conducted by Joe McKendrick, it was identified that six out of ten respondents were using open source code operating system. This is an indication that the lock-in of customers is being locked-out through enhanced features of operating system.

## DISCUSSIONS



### Structural Change in Operating System software market:

Table- 1 shows the average operating system market share of three major players who dominate the market. This data is compiled based on the market share data from four sources namely Net share, Stat owl, Stat counter and w3counter. As shown in Table-1 Microsoft Windows™ has lost nearly 10.5% of the market share between June 2007 and March 2013. It was a dominant player holding nearly 95% of

**Table 1: Average Brand wise Market Share of Operating System Product**

	Microsoft	Apple Mac	Linux	H-Index
May-07	94.3	3.9	1.3	0.89
May-08	93.9	4.3	1.4	0.88
May-09	92.6	5.6	1.1	0.86
May-10	90.0	7.5	1.3	0.82
May-11	87.8	8.5	1.0	0.78
May-12	86.4	9.3	1.1	0.76
Mar-13	83.8	7.5	1.4	0.71
Aug-14	84.05	8.09	2.92	0.71

Source: Patagundi, Basanna. (2014). Strategies for Sustenance of Market Share: A Study of Operating System Products. PhD Thesis.Manipal University, Manipal, India.

the market share for a long period of time. Linux's average market share has increase by 0.01% from 1.31 between June 2007 and March 2013. However, Apple Mac's OS™ average market share has increased from 3.9% to 7.5%. The market share for Apple Mac OS™ has increased by 3.6%. The last column in the table above is Herfindahl Index(H.I.) which is an indicator of the trends in the state of competition of the industry. The computed H-Index during May 2007 was 0.89. This is an indication of the presence of a dominant player. The H-Index during August 2014 is 0.71. The changing pattern of dominance in the market share is clearly evident from the H-Index. Table-1 also shows the volatility involved in the market share for operating system products.

**Table 2: Number of versions released during May 2007 to March 2013.**

No. of OS Versions released during –May 2007- March 2013		
MS Windows™	Apple Mac OS™	Linux
10	4	62

Source: www.wikipedia.org

Table-2 shows number of versions released during May 2007 to March 2013. The number shows the innovation factor in operating system products. Number of versions could be considered as an indicator of increase in demand for changes/updates. The demand for changes results only when customers start using the product. Due to the usage experience, customers demand for a certain change/update to accommodate their technology requirements. The demand changes can be easily accommodated by Linux because of open source. Feedback from users will be continuously monitored and observed. Since it is an open source, the changes are immediately done and new version of operating system is released. However, Microsoft Windows™ and Apple Mac OS™ have to follow meticulous organizations processes to design and release a new version of operating system. The design and development of operating system is restricted to only a team of engineers working for either Microsoft or Apple. Whereas, Linux operating system can be modified and a new version could be released by any developer who is technically sound to modify programme code.

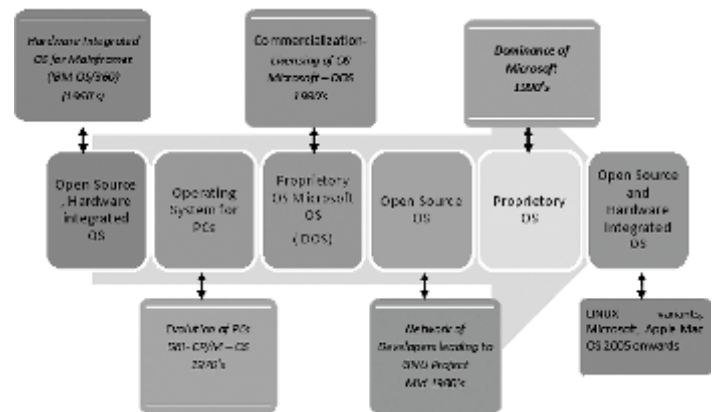
As shown in Table-2 Linux releases more versions of operating system at a faster rate as compared to Microsoft Windows™ and Apple Mac OS™. More releases could be possible due to the flexible process of developing and releasing of operating system. However, the changes/new versions are initiated and developed by users in case of Linux. In case of Microsoft Windows™ or Apple Mac OS™, the changes/new versions are initiated by users and developed by operating system developers in Microsoft and Apple Mac respectively.



**TREND IN OPERATING SYSTEM**

The trend in operating system has completed one cycle as depicted below. The trend could result in cyclical trend in future, provided the users prefer to use open source or hardware integrated operating system.

The cycle in figure 3.1 shows that the operating system



**Figure 3.1: Trend in operating System**

Source: Patagundi, Basanna. (2014). Strategies for Sustenance of Market Share: A Study of Operating System Products. PhD Thesis.Manipal University, Manipal, India.

products started with hardware integrated and open source applications. Then the trend moved to license based OS. It was an era of commercialization. A group of developers came together and started GNU project to counter commercialization. However, they were able to successfully develop the open source OS by early 1990's. During this time organizations started experimenting the open source OS. Due to its robustness most of the organizations started adopting it. Meanwhile, Apple Mac OS also improvised OS versions which were technically very sound. The acceptance of variants of OS of Linux and Apple Mac OS lead to the decline of Microsoft dominance. The trend started with open source and hardware integrated operating system and passed through phases of proprietary software leading back to open source and hardware integrated operating system practices. The various phases in the trend have been explained below.

In 1976, Digital Research Incorporated (DRI) sold CP/M operating system, to be used on the Machines based on Intel's 8-bit 8080 processor. In 1980, Microsoft paid \$100,000 for the rights to a CP/M derivative or clone software referred as "Disk Operating System" (DOS). After minor modifications to DOS, Microsoft referred to this updated operating system as MS-DOS. In 1981, IBM entered into the PC market and it chose Intel's new 16-bit 8088 chip as the CPU. IBM also decided to endorse Microsoft's MS-DOS as the operating system for their PCs. IBM's partnership with Microsoft did not last for long. In the meantime, IBM and DRI continued developing their own operating systems. Under the terms of the dissolution, IBM continued to develop MS-DOS, and consequently its own variant, PC-DOS, which IBM loaded on PCs bearing the IBM

nameplate. In exchange, IBM paid royalty to Microsoft for a predetermined number of units (Baseman, et al., 1995)8. Later, Microsoft's Windows™ turned out to be a major player in the operating system product category, which captured majority of the market. One of the major competitors for Microsoft, right from Microsoft's inception, is Apple Inc.

The aesthetics appearance of computers during this time was not very attractive to the users. Therefore, Steve Jobs and Steve Wozniak designed the computer with cases and other computer peripherals that would attract customers. Steve wrote the operating system for their Machine based on UNIX. They released their first Machine Apple 1 in 1975. Over a period of time depending on the requirements of the customers, Apple enhanced its product by introducing new software and features. These changes were incorporated in Apple 2 which was released two years after Apple 1. In mid 1980's Apple launched Macintosh which incorporated many effective graphical interface. Steve's association with XEROX Palo Alto Research center had a major influence on the design of Macintosh. However, Macintosh had closed architecture which resulted in software/application compatibility issues. Closed architecture implies that the structure and specifications of the computer hardware is not made available to public. Therefore, it will be difficult to write applications compatible to Mac computers.

Apple computers were appealing to customers. It generated demand amongst the business organizations. The other major players also forayed into the personal computers. One of the prominent players amongst them was IBM. They developed personal computers and used the operating system written by Microsoft. IBM Personal computers had open architecture. Open architecture allows others to clone personal computers and have a standardized processors and components in computer. This resulted in entry of other players into PC market. The open architecture was also useful for application software designers and users. Since all these Machines used standard software, there were no problems of compatibility of software.

Linux is one of the pioneering operating system in open source model. It was developed by Linus Torvalds. He was a student in Finland. MINIX was an operating system code written by Prof. Andrew S. Tanenbaum. He wrote a book on developing operating system. It was a kind of open source code of operating system. Probably, this book inspired Linus to develop a comprehensive open source operating system. Linux was made known to the world because of GNU (Recursive Acronym of GNU's not UNIX) project.

In 1983, Richard Stallman started GNU (Recursive Acronym of GNU's not UNIX) project which aimed at developing free and quality software. The team started working on developing open source software. However, developing an open source operating system was a great challenge. It was taking more time for the team to write open source operating system. During the same time Linus Torvalds developed an operating system as a hobby and was shared with GNU team. That was the birth of Linux operating system which had open source

code in the history of operating system software market.

Amongst these leading operating systems Microsoft Windows dominated the market. In 1993, Microsoft was faced with three different challenges. First, Sun Microsystems designed platform independent software, Java, to free developers from the underlying software/hardware platform. As Windows dominated the PC world, the evolution of a platform-independent software standard could be a serious threat. Second, Netscape introduced Navigator to allow the consumer to exploit the graphical content of the Internet. A Netscape monopoly on the product that allows the consumer to view the Internet could significantly constrain Microsoft's expansion plans. Finally, the open source operating system, Linux, evolved to challenge the Windows (Coate & Fischer, 2004). However, Microsoft was able to overcome the challenges by designing strategies which were perceived to be anticompetitive and sustain its market share during this period of time. Antitrust cases and paying penalty were apparently part of Microsoft's business cycle, but still Microsoft continues to have major share in the operating software market. However, in the recent years Microsoft is slowly slipping out as market leader. The market share of Microsoft is declining at a faster rate in the recent past. This trend is captured in table:1 above through. During the same time the other two players gained the market share. Apple Mac which is one of the hardware integrated operating system gained close to 50% more market share during the same time. Therefore, the trend of Operating system seems to be moving back to the 1970's where, most of the applications were hardware integrated and open source applications. This could lead to a cyclical trend in operating system software in the future.



#### WITCH OVER OF OPERATING SYSTEM

The switch over preference of users was captured through a survey. The respondents for the survey were the professionals working in information technology industry across MNC's in Bangalore. Operating system is highly a technical product. Therefore, the target group for survey had to be technically sound. The customers of operating system can be classified as enterprise and home segment customers. Generally, Enterprise customers are more informed about operating system as compared to home segment customers and would have more technical knowledge and usage experience of the operating system product as compared to home segment users. Hence, the target group selected for the research was enterprise users. The enterprise users in information technology industry use operating system product extensively either to develop or utilize any IT product.

The survey was a combination of web based survey and selection by reference database. (Referential sampling). The procedure of reference database involved identification of one reference in unit (in person) at random and move towards searching for others through references. The randomness of selection is ensured by accepting without bias but with a reference base. An instrument was developed to capture the present usage and preference to switch over operating system from the existing operating system. Out of 590 responses 554 valid responses were considered for analysis. The data used for the analysis was collected as a part of the doctoral thesis of the first author.

Preference to switch over operating system(%)

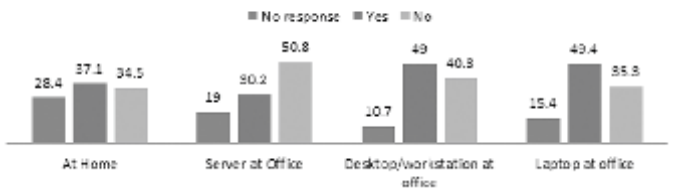


Figure 3.2: Preference to switch over operating system

Source: Patagundi, Basanna. (2014). Strategies for Sustenance of Market Share: A Study of Operating System Products. PhD Thesis. Manipal University, Manipal, India.

Figure: 3.2 shows preference of switching over of operating system from the current operating system. Most of the respondents would like to switch over operating system from the current operating system except on servers. Half of the respondents do not want to switch over operating system on servers, where as close to 50% of the respondents preferred to switch over operating system for desktop/workstations at office and laptop at office. Close to 38% of the respondents wanted to switch over to a new operating system at home. The data above indicates that more number of customers prefer to switch over operating system on computers at home, office and laptop at office as compared the switch over preference on servers. However, the switch over trend indicates that the customers are ready to switch over operating system and use the operating system other than the current operating system being used. Majority of the respondents are using Microsoft Windows operating system across all hardware and most of the respondents would like to switch over the operating system. This is an indication that the customers would like to experience the operating system other than Microsoft Windows operating system.

Respondents who wanted to switch over operating system on laptops preferred to switch over to Apple Mac OS™.

This is in indication of a customers' preference shift towards Linux operating system and Apple Mac OS™. The customer lock-in established by Microsoft Windows™ is locked-out and is losing critical mass. The existing literature shows that a superior technology can lock-out the customers and erode the critical mass. In the context of technology, first mover advantage will establish lock-in; however, the superior technology will override the first mover advantage and lock-out.

Microsoft Windows™ was enjoying monopoly till recent days. The market share in table: 1 indicates that it is edging out of monopoly. The preference of users might be moving away towards other operating system. This could be due to natural process of technology life cycle. Probably, the new wave of operating system might begin at the “chasm” stage of open source or hardware integrated operating system. This shift is due to the technological advancement and innovation factor.

In sum, the operating system market share innovation factor indicates that there is a probable shift of customers' preference towards open source operating system or hardware integrated operating system. The Microsoft Windows™ dominance in operating system product space may cease to exist.



CONCLUSIONS:

This research analyzed the trend in operating system software market. The trend was analyzed based on the historical growth and market share data. The recent trend is captured by analyzing the changing market structure. Customer usage experience was captured through a survey. The data analyzed in the present article reveals that there is structural change in the system software market. Most of the Customers were willing to switch over operating system

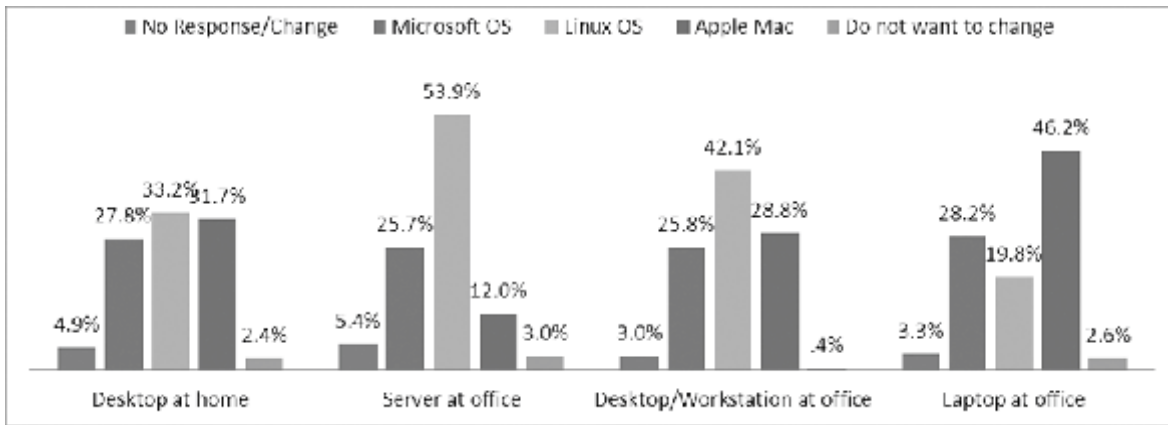


Figure 3.3: Brand preference to switch over of operating system

Source: Patagundi, Basanna. (2014). Strategies for Sustenance of Market Share: A Study of Operating System Products. PhD Thesis. Manipal University, Manipal, India.

The above graph shows preference of the respondents who wanted to switch over operating system from current operating system. Linux OS was the most preferred operating system for Servers, desktops at home and office. Nearly 54%, 34% and 43% of the respondents who wanted to switch over to other operating system preferred to have Linux operating system on servers, desktops at home and at office respectively.

either towards open source or hardware integrated operating system. Except laptops, open source operating system Linux was preferred on servers, desktops at home and office. Apple Mac OS™ was preferred operating system on laptops. Therefore, trend in operating system may be leading towards open source and hardware integrated operating system which existed in 1970's the early stages of software evolution. This trend seems to have completed on cycle as indicated in figure: 2.1.

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# IS XIAOMI A GAME CHANGER?

Anita Kumari Yadav<sup>1</sup>

## ABSTRACT

Mobile phones have become ubiquitous today. As they evolve, they are packing more and more functionality. The feature phone to Smartphone transition marks a major leap. As with every technological change, new companies are emerging to take advantage of the changes in market. Some of them may simply be imitating what others before them have done. Once in a while, emerges a company that seeks to change the very fundamentals of a market. It may be in terms of innovating new products, like Apple did by introducing iPhone a few years ago. It may also be in terms of offering value at a price point which may have been considered impossible so far. Xiaomi is one such company that has come up in the last four years. It has offered features to customers at less than half the price that its competitors are offering. To make it possible, it has utilized hitherto unheard business models that are made possible by emerging technology. By eliminating entire heads from its cost structure, it is able to offer smartphones at unbelievably low prices. Xiaomi was initially considered to be pursuing a non-scalable and non-sustainable business model and its critics were waiting for the forces of gravity to catch up with the company. However Xiaomi has defied expectations by capturing the numero uno slot in world's biggest Smartphone market – China. As it expands its footprint to more countries, including India, it will be more closely examined. This case study is an attempt to understand the things that make Xiaomi distinct and potentially a game changer.

**Keywords:** Game changer, mobile, smartphone, business strategy, marketing, sales, Feature phone



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**INTRODUCTION**

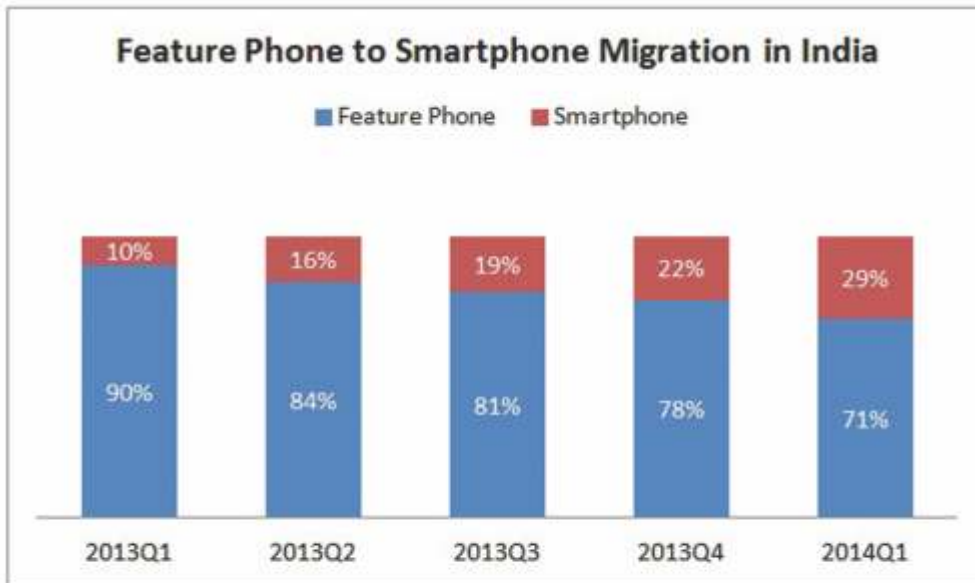
In today's digital age, smartphones have become an integral part of our life. These devices have many built-in functions and features which make our life easier. They are not only used to make and receive calls but one can send and receive mails, click photos, read data, play games, see reports, watch videos, transfer money, make all kinds of reservations whether it is railways or air-lines or hotels, use maps while driving, do e-shopping, listen to music etc.

Smartphone is defined as “a mobile phone with more advanced computing capability and connectivity than basic feature phones” [1].

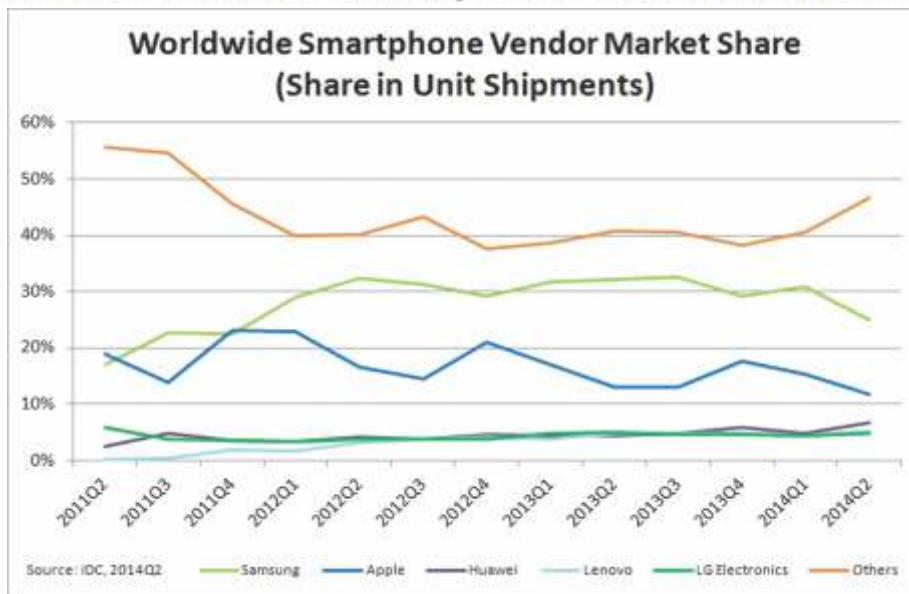
“In 1994, IBM and BellSouth introduced a combination phone and PDA called the Simon Personal Communicator. Simon, the first smartphone was heavy and costly [2]. After many

years of research and development, the size was reduced and many features were added. BlackBerry introduced its first corporate smartphone in 2002. Its main focus was e-mail and due to this it got huge positive response. In 2007, iPhone gave a new direction to smartphone market. Over time, feature phones are getting replaced by smartphones. The overall market share of feature phones in India reduced from 90% in 1Q 2013 to 71% in 1Q 2014. The feature phone to smartphone migration in India [3] is shown below

At present there are many players in the smartphone market like Samsung, Apple, Huawei, Lenovo, LG Electronics, Sony, Xiaomi, Karbonn, Micromax, Nokia and others. The world smartphone market is showing tremendous growth. It grew 25.3% in the second quarter of 2014. This is new single quarter record of 301.3 million shipments which crossed the 300 million unit mark in a single quarter. The world smartphone market share[4] is shown below :

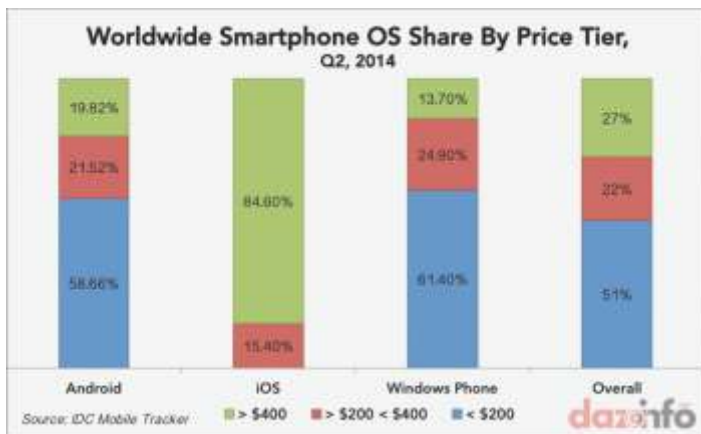


Source: IDC Asia Pacific Quarterly Mobile Phone Tracker, 1Q 2014

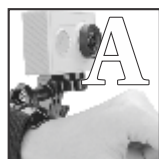


The various smartphone operating systems (OS) are Android, iOS, Windows Phone, Blackberry OS, Bada, Firefox OS, Tizen and others. Android is leading with market share of 84.7 in Q2 2014 followed by iOS which is having market share of 11.7%.

India is emerging as fastest growing market in smartphones. In the last quarter of 2013, Smartphone sales in India increased by 166.8%. Now India has become third largest smartphone market. China and the United States are at first and second position in terms of smartphone shipments. The report of Q2 2014 shows growth of smartphone is driven by low-end and mid-range smartphones [5]. This range controls 73% of the shipments. 216.25 million units of smartphone that were shipped during Q2 2014 were price tagged with \$400 or less. In the same quarter, major market share was captured by smartphones which were priced below \$200.



For the past several years, the smartphone market has been dominated by Samsung and Apple. Their current market share stands at 31% and 15%. However, a new wave of companies is rising which is threatening to disrupt the market. These companies offer smartphones that have comparable features to Samsung and Apple phones but at half or less of their price. The most notable example of this new wave of companies is China's Xiaomi which has zoomed to the top in the China market in just three years and has made waves with its recent entry into India.



**BOUT XIAOMI**

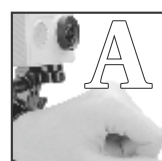
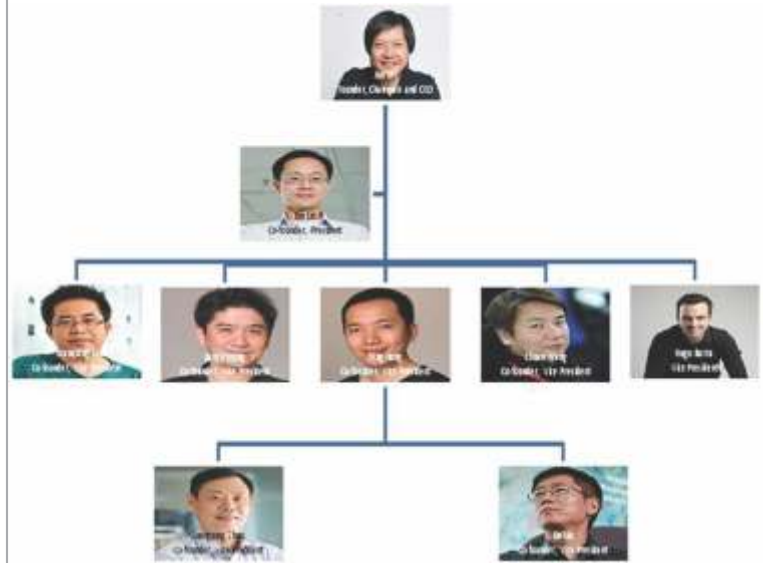
Xiaomi (pronounced SHAO-mee) is a mobile internet company founded in 2010. Its name literally means “little rice”. It is privately owned with its headquarters in Beijing [6]. It has had a meteoric rise and is currently valued at over 10 billion USD and has over 3000 employees [7]. Xiaomi's main portfolio of products includes:

Xiaomi is based in China which led the worldwide mobile

- Mobile Phones: Android based
- MIUI ROM: for use across multiple Android devices
- MiTalk: a messaging application
- MiBox: A set-top box for TV

phone market with sales of 108.5 million smartphones in April-June 2014 out of which Xiaomi accounted for 15 million devices [8]. At the time of preparing this study, Xiaomi sells in only a limited numbers of countries besides China viz. Indonesia, Brazil, Mexico, Malaysia, Philippines, Taiwan, Thailand, Vietnam, Russia, Turkey, Hong Kong, Singapore and recently India.

Xiaomi has made its name by designing phones with high end specs and selling them at mid range prices. In some cases Xiaomi phones are less than half the price of competitor phones with comparable specs.



**BOUT LEI JUN**

Lei Jun is considered one of the reasons behind the success of Xiaomi. His personality is said to have driven Xiaomi's success. Lei was born in 1969 and received a B.A. in computer science from Wuhan University in 1991. Before founding Xiaomi, Lei spent 6 years at Kingsoft, working his way up to CEO. “He also started an e-commerce site, Joyo.com, which he sold to Amazon for \$75 million, and become one of the country's leading angel investors, with stakes in online clothing retailer Vancl, shoe retailer Letao, mobile browser maker UCWeb, and communications portal YY, all of which have valuations in the hundreds of millions of dollars” [9]. In 2010 Lei got together with a few other founders and started Xiaomi. Lei is currently ranked 377 in the Forbes 500 list and is valued at \$4.1 billion.

Lei Jun says that he modeled Xiaomi after two distinct sources of inspiration: a hot pot chain called Hai Di Lao and a more than three hundred year old traditional Chinese medicine manufacturer, Tongrentang. Hai Di Lao, taught him the importance of customer service. Tongrentang taught him two things — never manufacture low-quality products for lowering cost and put all possible effort in producing the best quality products.

Lei has nearly 4 million followers on China's popular micro blogging platform, Weibo and feeds the buzz about Xiaomi by dangling teasers about new products and launch dates. Lei



once read a book on Steve Jobs and is highly inspired by him. He even copies some of Jobs' mannerisms like dressing up mostly in black T shirt and blue jeans; using keynote for presentations; building up excitement and launching products in a big way. Chinese media calls him "Steve Jobs of China". While some criticize Lei for it; his fans like his style and enthusiastically cheer his presentations and launches.



**IAOMITIMELINE**

Xiaomi has become the number one in sales in China in second (April-June) quarter of 2014. "Xiaomi's app store sees 3.5 million app downloads a day, 3.5 million photos uploaded to its cloud service a day and has seen 2 billion messages uploaded cumulatively"[10]. The fast growth of the company can be understood by just one piece of statistics – no company in China has reached one billion dollars in yearly revenue, faster than Xiaomi.



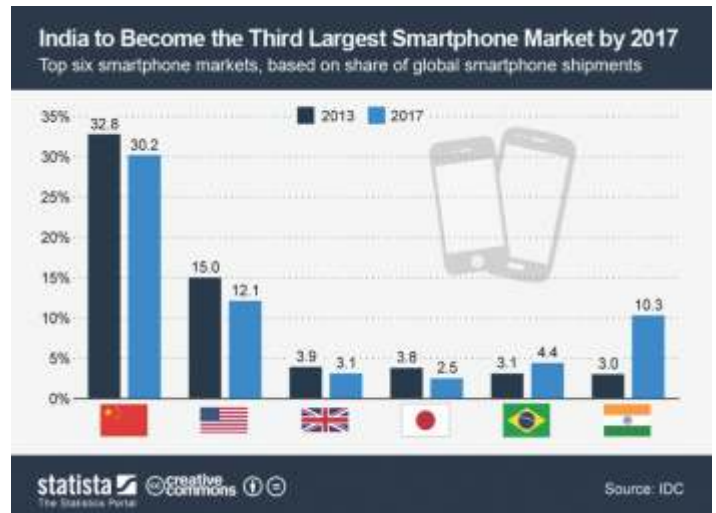
**Performance in China**



Xiaomi has become the number one in sales in China in second (April-June) quarter of 2014. "Xiaomi's app store sees 3.5 million app downloads a day, 3.5 million photos uploaded to its cloud service a day and has seen 2 billion messages uploaded cumulatively"[10]. The fast growth of the company can be understood by just one piece of statistics – no company in China has reached one billion dollars in yearly revenue, faster than Xiaomi.

**Entry into India**

Xiaomi is entering India at a time when the India Smartphone market is poised for rapid growth. The graph below shows that among the six major Smartphone markets in the world, India is expected to have the largest growth, by a big margin, between 2013 and 2017. It is well known that India is a highly price sensitive market. This large growth is expected to be largely driven by companies that offer good features at low price. Xiaomi seems to be looking to corner a big chunk of the increased volumes.



**The Stay so far ...**

As of writing of this case study, five flash sales for Xiaomi's Smartphone Mi3 have been held by e-retailer Flipkart. Following diagram shows the dates, number of units offered and time to sell out for the flash sales.



**Analysis**

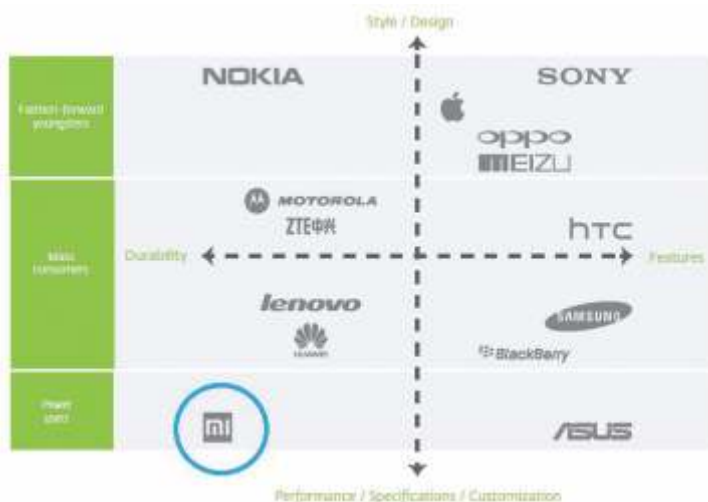
**Consumer behavior Analysis**

"Leading global smartphone brands offer distinguished hardware and interface design as well as strong features. On the other hand, Xiaomi mostly concentrates on building durable and high customization phones. Xiaomi gained popularity by identifying a niche group of smartphone power-users. These consumers are constantly tweaking their phones for richer features and the newest experience. Xiaomi phones are tailored for this particular group of consumers" [11]. This unique positioning is achieved by Xiaomi's Android ROM MIUI

**Competitor Analysis**

**Samsung**

Samsung is the global market leader in handsets. Samsung has been locked in a bitter patent-infringement battle with Apple. A few Samsung devices have even been banned in the US. If Samsung loses the battle, it may be forced into new innovation cycles which may negatively impact it in the short term but may be beneficial in the long run.



**Apple**

Apple is the number two in global sales. Apple had redefined the smartphone market with iPhone and its strategy is to further refine the iconic phone. Recently Apple has faced criticism that new versions of its devices have offered only incremental changes. It will be a big challenge for Apple to sustain its innovation after Steve Jobs' demise.

**Microsoft and Nokia**

Nokia used to be the number one phone maker in the world but could not face iPhone's onslaught. Most of it has now been acquired by Microsoft which has provided its Windows OS for the popular Lumia series. Historically Windows OS has never achieved much popularity in mobile space so it remains to be seen whether acquisition of Nokia turns things around.

**Google**

Google is the undisputed leader on the OS front with Android. On the handset side, its Nexus series has been quite popular. Nexus offered value for money to its customers. If Google can expand its product line, it can present a stiff challenge to the market leaders.

**Research in Motion**

BlackBerry has seen a steep fall from grace due to lack of innovation, unpopular designs, poor app ecosystem and outdated user interface. On the business side, however, BlackBerry continues to have pockets of strong influence. RIM is trying to build on that to make a comeback into mass markets.

**Demand Analysis**

Global Smartphone sales grew 27.2% year on year in the second quarter of 2014. The projection is that 2014 is likely to end with 1.3 billion shipments.

OS wise analysis: Android is expected to corner the biggest market share among various OS options with a market share in excess of 80%. iOS continues its slow slide down and currently stands at below 12%. Windows phone has seen a fluctuating market share and currently stands at just below 3%. BlackBerry has been a big loser over the past few years and currently stands below 1%.

Smartphone Vendor wise Analysis: Samsung continues its global leadership backed by high end smartphones within mature markets and wide range of entry and mid range phones in emerging markets. Apple had some year on year sales growth mainly coming from emerging markets. Apple's larger screen models are expected to revive sluggish sales. Huawei maintained third position just ahead of Lenovo. Huawei has been emphasizing large screen smartphones like its latest addition which has a 6.1 inch screen, one of the largest on offer. Lenovo has been increasing market share fast with its main presence in Asia Pacific. Once the acquisition of Motorola is completed, the company will acquire footprint in North America and Western Europe. LG continues as the fifth vendor but it is coming under increasing danger from Chinese Vendors like Xiaomi.



**WHAT MAKES XIAOMI A GAME CHANGER?**

**Cost leadership strategy**

Xiaomi has adopted business strategies that are radically different from other mobile phone manufacturers like Samsung or Apple. "While Apple ran iTunes for years at little or no profit — using its music, movies and apps as a way to sell higher-margin devices — Xiaomi's approach is similar to Amazon. Amazon sells its Kindle devices at or below cost to expand market share, using apps and content revenue to shore up slim margins" [12].

At a Mobile phone conference in April 2013, Xiaomi co-founder and president Bin Lin stated the company's driving philosophy as "Building a business on services by selling mid-to high-end smartphones at cost" [13]. What this means is that Xiaomi expects its revenues to come largely from services rather than by selling mobile phones. In the company's view, the days of large profit margins on making and selling mobile phones are gone.

Xiaomi offers high end specifications at mid level prices. Its first offering in India, Mi3, is compared below to three popular flagship models in the Indian market. Fifteen most useful parameters have been considered. On 12 out of 15 parameters, Mi3 is better or equivalent while on three parameters it is worse. This is fantastic value for money considering that Mi3 is priced at half or less of the other three phones. (The data has been sourced from India's leading e-commerce vendor Flipkart)

Table 6: Cross tabulation for department and skills present in employees (as per their perception)

Model	Xiaomi Mi3	Google Nexus 5	Samsung Galaxy S4	Apple iPhone 5S
<b>Price</b> (approx)	Rs. 13999	Rs. 28449	Rs. 27899	Rs. 44100
OS	Android v4.4.2 (Kitkat)	Android v4.4 (KitKat)	Android v4.2.2 (Jelly Bean)	iOS v7
Processor	2.3 GHz Qualcomm Snapdragon 800 8974AB, Quad Core	2.3 GHz Qualcomm Snapdragon 800	Quad-core 1.6 Ghz Cortex-A15	A7 Chip with 64-bit Architecture and M7 Motion Coprocessor
Size	5 Inches	4.95 Inches	5 Inches	4 Inches
Resolution	Full HD, 1920 × 1080 Pixels	Full HD, 1920 × 1080 Pixels	Full HD, 1920 × 1080 Pixels	1136 × 640 Pixels
Primary Camera	13 Megapixel	8 Megapixel	13 Megapixel	8 Megapixel
Secondary Camera	2 Megapixel	1.3 Megapixel	2 Megapixel	1.2 Megapixel
Flash	Dual LED		LED	Dual LED
Video Recording	1920 × 1080		1920 × 1080	1920 × 1080
HD Recording	HD, Full HD		HD, Full HD	HD, Full HD
Size	73.6x144 × 8.1 mm	69.17 × 137.84 × 8.59 mm	69.8 × 136.6 × 7.9 mm	58.6 × 123.8 × 7.6 mm
Weight	145 g	130 g	130 g	112 g
Battery	Li-Ion, 3050 mAh	2300 mAh	2600 mAh	Li-Ion
Internal Memory	16 GB	16 GB	16 GB	16 GB
RAM	2 GB	2 GB	2 GB	2 GB
Business Features			Document Viewer, Pushmail (Active Sync)	Document Viewer, Microsoft Excel, Microsoft PowerPoint, PDF, PPT, PPTX, XLS, XLSX, TXT, DOC, DOCX

**Operational effectiveness strategy**

Xiaomi does not own any factories. Its phones are manufactured by companies like Foxconn. This means it can utilize world's best factories. It has no sales channels or physical retail outlets. It is able to utilize its capital more efficiently since none of it is blocked in sales or stores. This give an edge to Xiaomi in global competitiveness.

Till now, all of their directors were Chinese but to mark their presence in the global market, they have hired Hugo Barra. He was earlier handling the Android division at Google. He is very much familiar with worldwide smartphone market [19]. He can set up Xiaomi's worldwide marketing strategy.

**Differentiation strategy**

Despite being called “Counterfeit Apple”, one of the ways Xiaomi differs from Apple is [14] “that it allows users to help design their operating systems. Every Friday at 5 in the evening local time, Xiaomi releases a new round of software updates for its own Android-based operating system — MIUI — to users in China and in other countries. Within hours, thousands of fans are on Xiaomi forums to describe bugs and give feedback. Of their millions of customers, there are a few hundred thousand hardcore fans that do the teardowns, scrutinize every spec and offer suggestions on how to change the phone”.

**Innovation Strategy**

Xiaomi does not own even a single physical store and sells each of its phones through its own online store or through tie up with online sellers. It does not do traditional marketing. In late 2012, Xiaomi decided to sell phones directly from Sina Weibo which proved successful when it was able to sell 50,000 units in 5 minutes besides a huge backlog of more than a million.

**Its phones' performance beats costlier phones**

Shown below are the results of some of the most popular Android phone benchmarking tests. These results have been shared by Xiaomi on their Google+ page. They compare



performance of Mi3 with other flagship phones which are priced more than double of Mi3.

*It is crowd sourcing mobile phone development*

Some companies like Apple are famously secretive about their development plans, so with their phones people don't know what to expect till they are released. Xiaomi gives users an opportunity to participate in designing their phones."In the past, fans have weighed in on how much memory they want in their phones, how thick the next generation model should be and whether there should be a flashlight on the back of the phone" [14]. This offers a fundamentally different and potentially better way to design phones.

*It is trying to take mobile phones the PC way*

Personal computers were a hot tech item twenty years ago; just like mobile phones are today. In an exploding market, leading manufacturers made huge profits by making and selling PCs. Similarly, in recent years companies like Apple and Samsung have generated record profits on the back of increasing mobile phone sales with healthy profit margins. However if we look at the progression of the PC market in the last twenty years, we see that they were increasingly commoditized. As a result profit margins kept on decreasing. This even led to some marquee names totally exiting the PC business. Xiaomi believes that mobile phones are in a similar situation now. In India we can see some evidence of this. India is a price sensitive market and local sellers like Micromax are gaining market share with their low priced phones. In fact, as of writing of this study, it has been reported that [15] "Micromax has ousted Samsung as the leading brand in all types of mobile phones in the April-June 2014 quarter". In the same quarter Samsung has been ousted by Xiaomi as the largest smartphone vendor in China.

*It wants to earn money not from phones but from services*

While the mobile phone hardware shows all signs of leading towards commoditization, mobile internet services are exploding. "The rise of smartphones, apps and mobile internet access has made the mobile phone a key battleground in the fight for new business and customers' attention. One of the main attractions of mobile marketing is that mobile phones are almost always switched on and people usually have them to hand. What's more, the mobile phone has become the first place many people turn in all kinds of situations: to check for directions or to look up the price of a product, indeed, to find any information online" [16].

*It is totally user and product focused*

Out of Xiaomi's 4000 employees, 2500 are communicating with customers and 1400 are doing research. Since a number of functions like sales and marketing are absent or severely curtailed, Xiaomi can focus all of its energy on developing its product and serving the users.

*It utilizes Flash Sales to excite the market*

One reason for the high demand for Xiaomi phones is the factor of scarcity attached with them. They are not available all

the time at the regular mobile phone selling outlets. Instead buyers need to keep track of the flash sales that happen periodically and only if they are able to beat the rush that usually happens, can they buy a phone. This strategy creates a strong excitement among prospective buyers. The company has been criticized by some people for their sales strategy. However, Xiaomi insists that flash sales enable it to estimate demand before producing more handsets and reduce its inventory carrying costs.

*It successfully elicits Word of Mouth Publicity*

Xiaomi's approach of involving users in "co-developing" phones has an additional benefit. If a person contributed to developing some feature in a Xiaomi phone, he/she is likely to tell everyone around him/her about it. This translates into free publicity for Xiaomi and it can afford to spend significantly less than its peers in advertising."Their approach also ties into a big trend that is fueling a hardware Renaissance globally: the ability to feel out product-market fit through social media before a capital-intensive manufacturing process — be it through Twitter, Weibo or a Kickstarter campaign. Through that feedback and Xiaomi's own in-house engineers and designers, miUI includes improvements over the standard flavor of Android" [17].

*They are successfully building a cult*

Fans of Apple are known to be fierce in their loyalty to the company. Xiaomi has built up a fan base that is equally energetic and loyal. They call themselves "mi fen" in Chinese. "The phrase is a pun that is shorthand for "Xiaomi fan" and also means "rice flour", a clever play off Xiaomi's name, which means millet or "little rice" [18]. They turn up in large numbers for Xiaomi events. After Apple, Xiaomi is the only company capable of producing huge queues to buy their phones.

Xiaomi has a toy rabbit as its icon. In 2012, the company reported selling 180,000 units of the icon.



Xiaomi gives out T shirts to fans at events. “It also sells other accessories like dolls and dongles that promote the “mi fen” culture” [18].



## FUTURE CHALLENGES

### Global Markets

Xiaomi needs to overcome a lot of challenges to move into Global markets.

- In some of the developed markets like the US, initial handset costs are heavily subsidized by carriers and then offset by post paid plans that the subscribers are locked into. This makes top-of-the-line phones more affordable and reduces the advantage that Xiaomi can offer in countries like China and India where their handsets are sometimes priced half of their competitors.
- The carriers are reluctant to sell fully branded handsets produced by newbies.
- Developed markets are already saturated with a large number of mobile devices, making penetration more difficult.

### Diversification

Xiaomi's continued success will also depend on whether it can replicate its success with mobile phones in other areas of consumer electronics. Xiaomi is already looking at Television.

### Monetization

Xiaomi's business strategy, though innovative, is still unproven. It has notched up the sales figures to establish its consumer presence but it is yet to show how it will monetize software services. This is an area where companies like Alibaba and Tencent have established themselves and will give stiff competition to Xiaomi.

### Product Differentiation

While Xiaomi is still a relatively new entrant, it can get away with simply offering same specifications as its rivals phones at lower prices. However as it gains market leader position, it needs to differentiate its products through innovation and research.

### Expected Retaliation

As Xiaomi eats into its rivals' market share, they can be expected to come out with lower priced products to wrest back lost market share. This may reduce the price advantage Xiaomi enjoys today.



## CONCLUSION

Launching a new phone is not something that a startup will normally attempt. However Xiaomi has successfully done it. One of the critical factors that helped the company in the initial stage was that unlike the US market which is totally

dominated by carriers, the Chinese market is more open. Consumers can buy and use the phone they want. So a new company can directly sell phones to customers without having to first build relationships with carriers which can be difficult.

Now that Xiaomi has established a base for itself in the Chinese market, it is looking to replicate its success globally. It has generated phenomenal buzz with its launch of the Mi3 in India through flipkart. It's first three flash sales have been sold out in mere minutes; some even in seconds. More than a hundred thousand customers are still waiting for future sales. If Xiaomi can replicate such success in more markets while keeping its business model profitable, it can be a true game changer in the mobile phone industry.

Xiaomi's continued success will also depend on whether it can replicate its success with mobile phones in other areas of consumer electronics. Xiaomi is already looking at Television.

CEO Lei Jun had once told the New York Times, “We're not just some cheap Chinese company making a cheap phone. We're going to be a Fortune 500 company.” So far it looks like they are on track.

## Questions

1. Xiaomi has made a great start but can they achieve economies of scale as they become a top five company?
2. Being a Chinese company, can they successfully market their brand outside China?
3. As their competitors copy their successful strategies like online marketing and flash sales, can Xiaomi innovate?
4. Can Xiaomi make the transition from “follow the leader” to “being the leader”?
5. Can Xiaomi replicate its success with mobile phones in other areas of electronics like TV etc.?



## APPENDIX: LITERATURE REVIEW

Downes and Nunes[20] discuss how silicon valley innovators are launching new products very fast to see which ones take hold. The ones that do, often result in “big bang disruption” - a phenomenon where products don't follow the usual pattern of customer adoption famously described by Everett Rogers. Instead they are perfected with a few trial users and then are embraced quickly by the vast majority of the market. Downes and Nunes also offer a few strategy for companies to survive big bang disruption.

Liu and Buck[21] consider examples from Chinese hi-tech industries and provide empirical data to investigate the impact of international technology spillover. They have analysed the impact of R&D activities done by multinational companies on innovation done by domestic Chinese firms.

Clark et. al.[22] discussed about how usage of Smartphone in the workplace impact an executive productivity and

efficiency. This technology helps the executive to find certain information accidentally which can be very helpful in strategic decision making in business.

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[17]	<a href="http://blog.sina.com.cn/s/blog_53e0a0b201018zot.html">http://blog.sina.com.cn/s/blog_53e0a0b201018zot.html</a>
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**TEACHING NOTES:**

**Case Synopsis:**

This case is about Xiaomi, a Chinese Smartphone company that has become number one in China in just four years. The company has become famous for its unique business model and marketing strategy which has enabled it to sell smartphone at unbelievably low prices. Now the company is entering global markets. It has made a sensational debut in India in 2014.

**Target Audience:**

This case can be useful for the students and practitioners of Marketing and Sales/ Strategic Management/ Business Research.

**Learning Objectives:**

This case would help the students to understand the strategies a new company can use to challenge well entrenched leaders in a highly competitive market. The students can also learn how cutting edge technology can be leveraged to gain a business advantage. This case could be a good example to understand how building a strong connect with the customers can help a company's brand.

**A Detailed Teaching Plan:**

Suggested time for this case study would be around 50-60 minutes.

Suggested student assignment related to this case could be to identify management theories that help to best explain the factors responsible for Xiaomi's success.

Teachers should support this case with other relevant cases from the industry that illustrate penetration of a market by a new company, innovative use of emerging technology and building strong customer connect with company brand.



DOCTORAL  
ABSTRACT

# MARKETING STRATEGIES AND PRACTICES OF READYMADE GARMENT RETAILERS

Ritu Bajaj



\* Professor, JIMS, Delhi, India

**INTRODUCTION**

The world is changing and India is also keeping pace with it. Liberalization and the steady economic growth have mainly driven a vast change in India. Industrial and technological growth has made a significant impact on the lives of consumers. The lifestyle of consumer is changing due to increase in mobility, increase in disposable income, media exposure, and increase in international exposure. Today's consumer is more knowledgeable and more demanding and one such industry, which has made a phenomenal impact on our daily lives, is retail. This industry touches our lives as an end consumer by providing us with the products and services for consumption.

Retailing is not only an important aspect of the economic structure but very important part of our lives. In fact, today retailing is evolving as a global high tech business. For retailers to adapt and grow with the changing time an understanding of consumer behaviour is very important to evolve marketing practices that satisfies customer the most. The study primarily aimed at bringing out marketing strategies and practices of readymade garment retailers. To examine the emerging trends in the retail trade and to identify the factors contributing to the transformation of readymade garment retailer.

The Study: Objectives, Rationale, Research Methodology and Chapter wise Scheme

1. To study the marketing practices followed by the readymade garment retailers
2. To compare type-wise and size wise the marketing practices followed by the readymade garment retailers.
3. To find out the factors influencing the decisions of a customer to purchase the readymade garments from a particular store.
4. To find out the satisfaction level of the customers of retail organizations.
5. To find out various issues that needs to be addressed for the success of retail organization.



**RATIONALE OF STUDY**

The present study has been done on mens readymade garment retailers of Delhi and National Capital Region (NCR). Delhi and NCR is the hub of retail activity, where 527 percent increase in retail floor space has taken place since year 2005. The study focuses on readymade garment retailing a part of clothing, textiles and fashion accessories segment which constitute the second largest block contributing Rs.1, 31,300 crore of retail market. The organized retail segment clothing and fashion accessory is the largest contributor to organized retail with 38.1 percent of market share valued at Rs. 29,800 crores. Further, the study is restricted to menswear readymade garments retailers, as menswear segment dominates with the largest contribution of 40.2 percent to the total readymade garment and accessories retail market in comparison to

womenswear and kidswear.

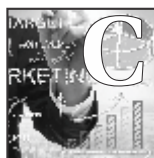
Research Methodolgy: The study has been divided in two part, one part of the study comprises of examination of the marketing practices of the readymade garment retailers of two main types of menswear readymade garment retailers viz. Exclusive Branded Outlets (EBOs) and Multi Branded Outlets (MBOs) in Delhi and NCR. It also examines the marketing practices and strategies adopted by retailers by classifying them on the basis of size i.e small, medium and large retailers.

**Classification of Retailers on the Basis of Size**

Type of Retailer	Size of the Store	No. of Respondents (Retailers)
Small retailers	Up to 2000 sq. feet	26
Medium retailers	2001-10,000 sq. feet	24
Large retailers	10,001 sq. feet and above	25

The information was collected from 75 retailers through a questionnaire. Purposive convenience sampling was used for the same. The questionnaire encompassed various aspects viz. marketing objectives, target customer group, price decisions, management of employees working with the retailer, communication mix decisions, selection of location and performance retailers etc.

Since customer is at the centre of all marketing activity, a comprehensive survey of 391 customers who made purchases at the readymade garment stores has also been made in order to get insight into consumer buying behaviour with respect to readymade garments as second part of the study. A separate questionnaire seeking customer response on various aspects relating to intention of making purchase, factors influencing choice of store, and satisfaction from purchases made in the store was developed. The main findings of the study and their managerial implications are presented in this chapter.



**HAPTERWISE SCHEME**

The whole study is organized into 5 chapters:

Chapter 1 is an introduction to retail. The chapter starts by understanding the concept of retail and functions performed by retailers. This chapter is divided into three sections. In section one concept of retailing, evolution of global retail industry, world scenario of retailing and key players contributing maximum share of global retail are considered. Section two starts with retailing in India. In this section drivers of retail growth, increasing retail space in metros and retail formats in India are discussed. Section three lays emphasis on readymade garment retailing.

Chapter 2 : Review of literature plays a vital role in a research work. It directs the researcher in proper planning and execution of the research work. It also broadens the mental horizon and thought process of researcher. It acquaints the researcher with work already done in the area and helps him/her to track down unexplored areas. The review of existing studies throws light on research problems that have not been covered or considered earlier. It enables the researcher to define the problem, set objectives and explore



the area through his/her study. In order to carry out the present study, a comprehensive/ extensive survey of literature relevant to study has been made. The same is presented here under.

Chapter 3 analyses the practices followed by retailers on the basis of size and type. This section deals in marketing strategies and practices adopted by readymade garment retailers operating in different retail formats. For the purpose, two major retail formats i.e. Multi Branded Outlets (MBOs) and Exclusive Branded Outlets (EBOs) have been selected. For the purpose of the study of retail marketing practices, a field survey was conducted through a schedule, which was administered personally.

Chapter 4 in hand brings the retail management practices from customer's viewpoint. This chapter analyses different aspects of customer buying behaviour viz. intention of visiting a readymade garment store, frequency of shopping for readymade garments, price reduction offers influencing the purchase decision. The present study also analyzes separately the factors that turn significant for the choice of readymade garment store and those affecting the satisfaction level of customer about various aspects of the store.

Chapter 5 presents the findings and suggestions based on primary data subjected to different statistical tools.

The major findings of the study of customers are as follows:

The study reveals that majority of customers of different age groups and occupation groups go out for shopping of readymade garments once in a month. Thus most of customers frequently visit a readymade garment store for making purchases. Further, majority of customers having family income less than Rs.25, 000 go for shopping of readymade garments once in a quarter or half yearly. This is in contrast to the buying frequency of customers in other three higher income groups.

The study exhibits that the older the customer, the higher is intention to make purchases while visiting a readymade garment store. While, the customers of service class and students sometimes tend to visit the store for gathering information. This is in contrast to businessmen who rarely visit the store for gathering information. This may be due to the paucity of time and higher disposable income with businessperson in comparison to customers of the other two occupation groups. Thus the study found that customers of different age groups, income groups, and occupation groups mainly visit the readymade garment store with the intention of making purchases therein. They may sometime or rarely visits a store with the intention of spending leisure time or gathering information.

The study also reveals that there is no significant difference in the intention of customer whether they visit Exclusive Branded Outlets (EBOs) or Multi Branded Outlets (MBOs). The main purpose of visiting the store remains to make purchases.

The study highlights that customers of different age

groups (except 41-60 years) and income groups (except less than Rs 25,000) often makes purchases of readymade garments from a specific store. In contrast, the customers of age group between 41-60 years and family income less than Rs. 25,000 prefer to purchase readymade garments as per convenience i.e. not from any specific store. Among the customers of three occupation groups, businessmen often purchase readymade garments as per convenience, whereas servicemen and students sometimes go to specific stores and sometimes even shop as per convenience.

The study highlights the price reduction offers liked by customers. According to findings 'schemes' and 'discounts' are the important promotional/price reduction offers that have an important influence on customers of all age, income and occupation groups. There is a significant difference in the importance given by customers of different age groups to clearance sale, privilege customer offers and schemes; customers of age group less than 25 years are highly influenced by privilege customer offers in comparison to other age groups. The schemes are considered more important by 41-60 years of age group. However, Clearance Sale, is an important price reduction offer for customers of age group more than 26 years.

The occupation wise analysis reveals that there is a significant difference in the extent of importance given to schemes and credit points by servicemen, businessmen and students. The income wise analysis brings out that there is significant difference in the importance given to various promotional/ price reduction offers, except 'schemes' by customers of four income groups.

The study in Table 1, reveals customer satisfaction based on experience of shopping in the store. Though customers are satisfied there is a significant difference in the level of satisfaction of customers across different age, income and occupation groups.

**Table 1: Overall Satisfaction Based on Experience of Shopping in the Store (ANOVA across Demographics)**

Demographics	Description of Demographics	Mean	S.D.	F-value	p-Value
AGE	Less than 25 years (N = 160)	4.08	.53	65.17**	.000
	26-40 years (N = 133)	4.26	.76		
	41-60 years (N = 98)	3.29	.27		
INCOME	Less than Rs. 25,000 (N = 59)	3.85	.74	12.1**	.000
	Rs. 25,001-40,000 (N = 121)	3.72	.62		
	Rs. 40,001-60,000 (N = 81)	3.84	1.1		
	Rs. 60,001 and above (N = 130)	4.25	.58		
OCCUPATION	Servicemen (N = 165)	3.83	.89	3.73*	.025
	Businessman (N = 162)	4.06	.76		
	Students (N = 64)	3.92	.27		

\* Significant at .05 level

\*\* Significant at .01 level

**Table 2: t-Test for Satisfaction based on Experience of shopping inside the store for two different formats of retail outlets (EBO and MBO)**

Variable	EBO (N = 207)		MBO (184)		t-value	P-value
	Mean	S.D	Mean	S.D		
Overall satisfaction	3.82	.86	4.07	.64	3.29**	.000

\*\* Significant at .01 level

The Table 2, represents that t-test was conducted to measure the satisfaction of customer of EBOs and MBOs based on experience of shopping inside the store. The mean values represented that the customers are satisfied with both EBOs as well as MBOs. The t-test reveals that overall satisfaction of customers of MBO is more than that of EBOs. The reason might be more choices available in case of merchandise offered and the great ambience of MBOs.

Factor Analysis was also conducted on set of customer's questionnaire and it was revealed that 7 factors for influencing the choice of readymade garments were deducted. These are named as ambience, key services, and monetary considerations, image of store, family choice, visual merchandising and recommendations by friends. All these factors account for 68.80 percent of variance.

First extracted factor named as *ambience* comprises of cleanliness, temperature, escalators/lifts, safety and security, adequate floor space, lighting, window display, back ground music, entertainment facility, and interior decoration. Ambience appeals consumer and encourages them to buy as it enhances shopping experience. The factor -II, (*Key services*) indicates long hours of service, prompt billing, parking facility and in store promotion are key services that differentiate one retailer from another. The factor III (*Monetary consideration*) indicates pricing decisions are important for a successful retail business. Facility of exchange is the right of the customer expected from a retailer. If exchange facility is available, customers are ready to pay the price charged for the readymade garment, as they feel comfortable due to reduced risk of blockage/ waste of money. Factor IV (*Image of the store*), highlights that store location and response of sales person play an important role in building up the image. An image of a retailer is formed in the mind of the customer, which is based on experience gathered over-time. Factor V (*Family choice*) indicates that readymade garment shopping is an integrated process in which family goes out for shopping and makes it a leisure activity. Family choice is further dependent upon quality and variety of garments available at the store and acceptance of credit card/ debit cards therein. Factor VI (*Visual display of merchandise*) highlights that the visibility of the garments creates a desire to buy in the mind of a customer. The convenient layout enables the customers to feel the garments of their choice and thus makes shopping a pleasant experience. Factor-VII (*Recommendation by friends*) suggests that recommendation by friends is like word of mouth publicity. Recommendation by friends for a particular retailer comes when either the retailer provides value for money or provides exceptional services and/or it has collection of products that seems to match the noticeable preferences of a customer group.

The factor analysis has enabled to extract another 7 factors

(Principal Component) for customer satisfaction based on purchases made in the store. These are named as neat and spacious place, visual merchandise, value added services, image of retailer, process related services, congenial atmospherics and product features. All these factors account for 65.12 percent of variance. Factor I (*Neat and Spacious Place*) suggests that beside cleanliness the customers need space to judge suitability of a garment by handling it in different positions. Purchase of garments takes some time; interior decoration (like mirrors) and sitting space/facilities provide the necessary comfort desired by the customers. Factor-II (*Visual Merchandise*) indicates that visual merchandise creates the first impression about the store in the minds of the customer. It induces potential customers to enter the store and make purchases. An effective window display works as a 'silent salesperson' by providing satisfactory information for drawing customers inside the store. Further, proper layout on shelf enables a customer to feel the garments and get satisfactory experience. Factor-III (*Value added Services*) highlights that the customer centric retail business services viz. long hours of service, entertainment facility, alteration facility, packaging and acceptance of credit card and debit cards play a very important role in enhancing customer satisfaction and thus differentiating one store from another. Factor-IV (*Image of Retailer*) suggests that association among attributes like product quality, price charged, variety and sales person's services influences the perception of a customer about the readymade garments retailer. Factor-V (*Process Related Key Services*) highlights services like facility of exchange, parking facility and prompt billing. The smooth provisions of all these three key services require proper processes to be put in place. These key services influence shopping experience of a customer. Factor-VI (*Congenial Atmospherics*) represents customer friendly shopping atmosphere is where the customer feels comfortable to shop around and variables like background music played, temperature, lighting, safety and security creates customer friendly atmosphere in a store. Factor-VII (*Product Features*) suggests that customers get satisfaction from a readymade garment store when they come across garments (product) that offer the latest designs nice colours and comfort of usage.

Every retailer has certain marketing objectives and customer satisfaction is the most important marketing objective for EBOs and MBOs as well as small, medium and large retailers. However, there is significant difference in the importance given to the objectives of meeting competition and increase in return on investment. EBOs consider these objectives more important than MBOs. Further, size-wise analysis reveals that the smaller the retailer, the higher is the importance given to increase in return on investment objective.

All the retailers i.e. EBOs and MBOs as well as small, medium and large retailers consider customers of age group 25-35 years and 35-45 years as their main target customers. A vast majority of multi branded outlets and large retailers also considers 15-25 years of age group comprising of teenagers and youngsters as their target

customer group in contrast to EBOs, small and medium size retailers.

Today a retailer makes efforts for attaining a particular kind of image that distinguishes it from other stores and helps to attract customers. In case of Exclusive Branded Outlets (EBOs) and small retailers, brand(s) available has been found as the main feature for which readymade garments store is known for. The EBOs and small retailers strategy is to use strong brands to attract the customers. But for MBOs, medium retailers and large retailers, high quality of garments has been found as the main feature for which the store is known for. MBOs and large retailer strongly agree that a Private label is another very important variable contributing to the store image. In contrast to EBOs, small and medium retailers mainly deal in manufacturer's brands. Large and medium retailers along with MBOs strongly agree that high quality of products and quality of service differentiates their stores from others.

Majority of retailers concentrate on casual wear, party western wear and formal wear. Most of the MBOs and large retailers deal in all categories of menswear garments including party ethnic wear. Majority of multi branded outlets and large retailers also deal in party ethnic wear which is in contrast to practice followed by exclusive branded outlets, small and medium retailers in this regard. Thus, large retailers tend to make large investments by providing shelf space to all categories of menswear garments.

A proper merchandise planning is required before the brand reaches the shelves of the store. Normally six months planning is required for readymade garments. Majority of retailers irrespective of size and type add new style at the time of change of season, during January–February and July–August.

The study reveals that majority of garments in retail stores have shelf life of 30-60 days. The shelf life of garments is more in case of multi branded outlets and large retailers than that of exclusive branded outlets and medium size retailers. However, not even a single EBO and small retailer has shelf life more than 60 days i.e. 2 months. But a few MBOs and medium size retailers as well as large retailers have shelf life of garments of more than 2 months.

The study reveals that in case of factor influencing pricing decisions, no significant differences have been found in the mean score(s) regarding cost factor among different types of retailers. This represents that cost factor is the most important variable influencing pricing decision of readymade garment retailers and is closely followed by profitability targets.

However, influence of the two factors viz. market price of similar products and response of target customer group is significantly more in case of MBOs and large retailers than EBOs and small retailers. Further influence of profitability

targets on pricing decisions is more in case of EBOs than MBOs. Similarly profitability targets have more influence on medium and small retailers than large retailers.

The study revealed that at overall level, majority of readymade garment retailers adopt equal pricing strategy. However, size-wise analysis brings out that majority of small and large retailers follow equal pricing strategy. In contrast to this, majority of medium size retailers follow higher pricing strategy. Most of the MBOs and large percentage of EBOs follow equal pricing strategy too.

The study also reveals that there is no significant difference among factors considered by the various types of retailer for the selection of store location. For all the retailers, transportation facility has been found as the most important factor influencing selection of store location. Relevant customer traffic and similar store in the area are other very important factors in this regard. Only one factor i.e. adjoining stores, has significant difference in the mean values of small, medium and large retailers. The smaller the retailer, the higher is the importance given to adjoining stores while selecting store location. Adjoining store is one of the factors that help in increasing footfall in the store too.

Study reveals that among the various components of ambience the retailers of different size and types consider lighting, temperature, interior decoration, and background music as very important variables for a retail store, with no significant differences in the mean scores of retailers. MBOs give more importance to adequate floor space, lifts/ escalators, rest rooms/ washrooms, entertainment facility and mirrors on the walls than EBOs. Further, size wise analysis reveals that the larger the retailer, the higher is the importance given to adequacy of floor space, lift/escalators and restrooms.

Regarding the role of ambience factors for a retail store, the study makes it clear that ambience distinguishes a store from other stores in the market irrespective of the size and type of store. Further, MBOs and large retailers exhibit significantly higher role of physical facilities in attracting new customers to the store. The study shows that due to ambience factors, customers feel more positive about the products of the store and likelihood of product sales increases at the store in case of MBOs. Further, the size wise analysis exhibits that smaller the retailer, the higher is the role of ambience in making customers feel more positive about the products.

Readymade retailers make use of various promotional tools that offers extra value and incentives to customers for visiting a store. Price offs/ discounts are the most preferred form of sales promotion tools used by all the retailers irrespective of their size and types. The size-wise analysis exhibits, that there is difference in the use of various promotional tools. It brings out that the larger the retailer, the more frequent is the use of credit points and offer to privilege customers. Further, type wise analysis

found that MBOs make more use of these two promotional tools (credit points and offer to privilege customers). In contrast, free offers are used more by EBOs than MBOs. Further, the smaller the retailer, the more is frequency of use of the free offers.

Retailers use various sales promotional measures to sell their merchandise. No significant difference has been found in the importance given to various promotional measures by EBOs and MBOs. However, size-wise analysis exhibits that the large retailers consider promotional measures more important in increasing the turnover and converting casual buyers to regular buyers.

Retailers use various communication tools to communicate to the customers. For retailers of different type and size, newspapers and magazines are the most often used communication tools. This shows that print media is still a preferred form of communication for the modern readymade garment retailers. The ANOVA results exhibits that larger the retailer the more use is made of brand ambassadors and event sponsorships. Further the EBOs make more use of brand ambassadors than MBOs. However, in contrast to this, MBOs make more use of event sponsorships.

Regarding the motives of communication, the ANOVA brings out the smaller the retailer, the more is the emphasis on repeat sales to existing customers and to encourage large purchases by customers. The study also exhibits that EBOs give more emphasis than MBOs on encouraging large purchases and countering competitor's activities. Thus all the retailers agree to the fact that external communication is done with the view to attract new customers and to encourage large purchases.

Retailers of different size and type are always providing additional services such as alteration facility, replacement in case of defect, and exchange facility. Even the service of home delivery is provided in case required.

Regarding safety and security provisions the study reflects that all retail stores ties up with security agencies. Fire alarms and video camera are very often used by the retailers irrespective of size. Further, the type-wise analysis brings out that MBOs makes more use of electronic devices at entry and exit, separate entry and exit for staff and tie up with security agencies in comparison to EBOs.

Regarding the role of information technology in retail store, the size-wise analysis exhibits that the larger the retailer, the more importance is given to use of technology in buying and merchandise planning, point of sale system, customer relationship management, finance and stock planning. The type-wise analysis brings out that MBOs give more importance to use of technology in above said areas of business than EBOs.

**Table 3: Performance of Readymade Garments Retailers**

Details	Small Retailers	Medium Retailers	Large Retailers
Avg. sq feet area	1103.8	4319.6	24,240
Average Annual Sales	1.59 crore	5.083 crore	18.08 crore
*Avg. sales per sq. feet per day	45.645	36.549	25.17
Average Bill of shopping per transaction	Rs. 1384.60	Rs. 3066.7	Rs. 1632
Average Annual footfall in nos.	21,296	49, 196.7	3,41,202
Conversion Ratio	54.808 %	46.042 %	37.2 %
% of Display	90.769 %	88.625 %	85 %

Source: \*A financial year consists of 325 days

The Table 3, presents performance of readymade garment retailers on the basis of size i.e. small, medium and large. In order to judge the performance of retailers on the basis of size, information on various aspects like square feet area, annual foot fall, annual sales, bill size per transaction and percentage display of merchandise was taken from the retailers during the survey of their respective stores. For the aspect average size of the store, large retailers as the name indicates have the largest size of 24, 240 sq. feet as an average size of the store in comparison to medium store with the average size of 4,319.6 sq. feet. Small retailers have small size of 1103.8 sq. feet. The annual average sales for large retailers is the highest (Rs.18.08 crores), followed by medium retailers (Rs.5.08 crore) and the lowest sale is obtained by small retailers (Rs.1.59 crore). However, the average sale per square feet per day is highest in case small retailers (Rs.45.645), followed by medium retailers (Rs.36.549). The lowest average sales per sq. feet are obtained by large retailers (Rs. 25.17 crore). Thus, in spite of having the largest size of the store, the return per square feet is less for large retailers. In fact, the smaller the retailer, the larger is the average sales per sq. feet per day.

The average bill of shopping per transaction for medium retailers (Rs.3,066.7) is the highest. It is followed by large retailers (Rs.1,632) and the lowest average bill is obtained by small retailers (Rs.1,384.60). Similarly the average annual footfall is the highest in case of large retailers with 3, 41,202 followed by medium retailers of 49,196.7 and the lowest average annual footfall in case of small retailers is 21,296.

Conversion ratio is defined as percentage of consumers who buy the product after viewing it. It comes out to be high for small retailers (54.808 percent) in comparison to medium retailers (46.042 percent). The lowest conversion ratio is obtained in case of large retailers (37.2 percent). Percent display is defined as percentage of merchandise placed on various display fixtures for customers to examine. All the retailers display more than 85 percent of stock irrespective of size. However, the analysis does reflect that the smaller the retailer, the higher is the percent display.

The size-wise analysis of performance of readymade garment retailers shows that the smaller the retailer, the higher is the conversion ratio, percentage display and average sales per sq. feet per day. The analysis of average sales per sq. foot implies that the smaller retailers enjoy higher 'Space Productivity' than the large size retailers. On same measures EBOs have exhibited better performance than MBOs.



**SUGGESTIONS**

Since customers are more satisfied with MBOs, EBOs need to pay special attention to various aspects that can contribute to improve customer satisfaction. These

may include ambience, lifts /escalators and safety and security aspects.

Customers give importance to sitting place but only large retailers and MBOs provide this facility while EBOs, small and medium retailers need to pay more attention for providing this facility.

Readymade garment retailers can make more use of discounts and schemes because these have an important influence on customers of all age, income and occupation groups.

Entertainment facility is given importance by the customer but few large size retailers are only providing this value added service. Both the EBOs and MBOs need to concentrate on providing this service too.

Parking facility is key service for customers. It is an important consideration by retailers during selection of location of retail stores that are coming up. So retailers, especially the large ones, need to provide the facility of free parking. In order to get competitive edge over competitors who still lack this facility.

Visual display of merchandise is very important factor for attracting customers to the readymade garment store. To make shopping of garments an enjoyable experience, retailer should display garments in such a convenient manner that the customer can feel (touch) the garments without any problem.

The space of the store should be managed in such a way that there is optimum utilization of space and more space is created in selling area. Space management is divided into three areas-selling area, stocking area and facility management area. Through proper space management in the selling area, optimum space productivity can be obtained. It should also ensure proper roominess/ space to facilitate movement of customers without feeling inconvenient. In selling area space should be sufficient for a customer to handle the garments in different positions to judge its suitability.

Keeping in view the role of recommendation by friends in choosing a store for buying readymade garments, a

retailer can reap the benefits of word of mouth publicity. To get publicity, a retailer should ensure that no customer should be left unattended and feel dissatisfied with the services of the store. As one satisfied customer can bring many more customers.

Information technology is base for the smooth functioning of retailers of different size and types are not giving due attention to its application in certain vital areas viz. sales forecasting, supply chain management and customer analysis. Use of Information technology need to be strengthened in these areas of readymade garment retailing where the product obsolescence is fast due to changing fashion.

Customers with age group between 41-60 years and less than Rs. 25,000 family income groups purchase readymade garments as per convenience. The customers consider ambience and key services in choosing a store for shopping of readymade garments. For a retailer transportation facility and parking facilities available are basic criteria for deciding store location. Thus, by emphasizing the ambience and key services in the store the readymade garment retailer can attract the customers of the above said age and income groups.

A store is known in the market and carries an image in the minds of the customer. The image of retailer is created by product quality, sales person's services and variety. With the onset of organized retailing, retailers need to work more on these areas. Retailers are required to give lot of emphasis on training of staff to enhance their selling skills.

Since ambience plays a distinctive role in case of readymade garment retailers, they should continuously bring innovative changes in the store ambience related components, in order to get a competitive edge over other retailers of readymade garments.

Small retailers who usually spend very little amount on store promotion, can attract customers i.e. increase footfall by locating store at place where adjoining stores create synergy.

MBOs and large size retailers need to take measures to improve their performance especially space productivity and conversion ratio.

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