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on

**Innovative Strategies in Business Management and
Technology in the Emerging Scenario**

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Sri Balaji University Pune (SBUP),
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Sri Balaji University, Pune (SBUP)

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Editorial

The Mimansa Research Conference presented a confluence of the best of minds in academia and industry on contemporary topics of relevance in the domain of Business Management and Technology. The multidisciplinary conference provided a holistic and comprehensive understanding of the opportunities and challenges facing us. Mimansa, as embodied in its name, aimed to foster a scientific temper, spirit of enquiry and profound reflection. High-quality research papers and case studies describing original and unpublished results of conceptual, constructive, empirical, experimental, or theoretical work in all areas of Business Management and Technology were presented at the two-day conference. This special issue of MANTHAN covers a few research articles presented at the Mimansa Research Conference, 2021 and selected for publication after a rigorous review process.

R. Sona in her article titled 'Knowledge Hiding Behavior, Role Stress and moderating effect of Affective Commitment: An empirical analysis emphasized on impact of Knowledge hiding behaviour on performance of employees,' presented in-depth thoughts on role stress and affective commitment. Mufaro Dzingirai and Rodgers Ndava in their article titled 'The Role of Business Intelligence in Strategy Implementation in State-Owned Enterprises' highlighted that business intelligence plays an enabling role in strategy implementation through real-time performance tracking and monitoring, promoting flexibility, data accuracy enhancement, data integration, and boosting customer satisfaction.

Debraj Datta in his article titled 'Incorporating the Semiotic approach into Brand Iconicity to Establish Unique Value Proposition,' focussed on the importance of using signs and symbols and how they help consumers to establish a connection with the brand, resulting in buying action. Devashree Lote, Vikas Namjoshi and Binod Sinha in their article titled 'The Effect of Nudge Marketing on consumer buying behaviour for smartphones in e-commerce' pointed out how Nudges like user ratings and purchase pressure cues have a significant impact on consumer buying behaviour.

Vidisha Khaitan, Ramesh Jadhav and Binod Sinha in their article titled 'Study on Consumer's Perception towards Digital Wallets in Pune City, Maharashtra' highlighted the problems faced by consumers while using digital wallets which in turn impact their usage. Samiksha Sahu and Rajeshwari Patil in their article titled 'Employer Branding: an HR tool for talent acquisition' studied the concept of employer branding, the practices that can be adopted by the organization, and the psychological factors influencing these practices.

Editorial

Satya Kishan in her article titled ‘Social Media’s Out-turn on Youth’ determined the influence of social networking sites on youngsters and the numerous issues that come with them. Nikhil Singh, Archana Shrivastava and Bhushan Pednekar in their article titled ‘The impact of Digitalization on Employee Performance in the Banking Sector’ focussed on how digital transformation connects to worker’s performance.

Vikram Hande and Vivek Marathe in their article titled ‘Big Data & Analytics for Service Operations: Innovations & Challenges’ outlined how big data and analytics can be used with a service blueprint for new innovations to improve the service quality. Bhushan Pardesi, Padmalochana Bisoyi and Pranita Burbure in their article titled ‘Financial factors and the probabilistic prediction of financial failure: Evidence from Central Public Sector Enterprises in India’ focussed on how important it is to predict the failure of Govt. Enterprises.

Best compliments to all authors.

Dr. Archana Shrivastava

Dr. Binod Sinha

Guest Editors

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Financial Factors and the Probabilistic Prediction of Financial Failure: Evidence from the Central Public Sector Enterprises in India

Bhushan Pardeshi, Padamalochan Bisoyi** and Pranita Burbure****

ABSTRACT

The present, obvious growing failure of the enterprises in India and the factors that push them to fail obviously call the sustainable financial health of these enterprises into question. The policies, regulations, and new strategies should be developed to help management and policy makers to examine the factors that affect the likelihood of failure. For the purpose of this study, 27 Heavy, Medium, and Light Engineering Enterprises were chosen as a sample, with a ten-year study period. 15 variables were chosen that are identically correlated with the occurrence of failure via Principal Component Analysis. Logistic regression was used to examine these variables. The result of logistic regression has an accuracy of 83.9% in predicting the failure. Financial health was also examined using the Altman Z score model. The failure may be avoided if influencing factors are timely established and the correct prediction model is applied to enhance the financial situation.

Keywords: *Bankruptcy prediction; Central public sector enterprises; Financial failure; Logistic regression.*

1.0 Introduction

Because of the valued contribution of the Central Public Sector Enterprises (CPSEs) to the Indian economy over the last seven decades, India has ranked high among the world's top industrialised nations. However, given the way the public

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sector has grown, it is always a source of controversy. Many CPSEs have underperformed their budgeted targets; as a result, these businesses have failed or are on the verge of failing due to poor profitability (Mishra, 1986; Venkatachalam, 1988). These inefficient CPSEs are becoming liabilities for the government (Talha, 1986), raising serious concerns about their sustainability. The failure of any enterprise has a significant impact on stakeholders in particular, as well as the entire economy in general (McKee & Lensberg, 2002; Tsai, 2008). Financial failure prediction has been a topic of debate in academic literature and business around the world. As a result of incorrect prediction and decision-making, the business may face additional financial difficulties.

The primary focus of this study was the prediction of financial failure, which is important from an economic standpoint because it can affect many stakeholders at the same time. Our paper investigates the factors that contribute to the failure of Heavy, Medium, and Light Engineering Central Public Sector Enterprises. How to predict failure by analysing the factors? In addition, the effectiveness of the logistic regression approach in prediction will be evaluated. We also aimed to assess the financial health of CPSEs in order to determine their long-term viability. We concentrated on the Heavy, Medium, and Light Engineering Central Public Sector Enterprises from India as a study sample because most studies were conducted in India and around the world on private sector organisation industries such as hospitality, construction, manufacturing, and so on, or on specific organisations in general. Only a few researchers conducted studies on public-sector enterprises to the extent of studying the problems and reasons for the poor performance by CPSEs and knowing the financial health of the CPSEs. The objectives and magnitude of operations of public sector enterprises differ significantly from those of private sector enterprises. The treatment of financial failure, insolvency, and bankruptcy is a distinct event in the context of a business model.

Recently, many researchers have used logistic regression approaches to improve the accuracy of bankruptcy prediction. Many academic studies have used traditional statistical techniques to predict financial failure and bankruptcy, such as multiple discriminant analysis and logistic regression (Kim & Zheng, 2006; Min & Jeong, 2009; Dakovic *et al.*, 2010; Koh & Killough 2010; Barreda *et al.*, 2017).

An enterprise's success or failure is determined by the interaction of numerous financial factors. A noticeable drop in profitability marks the start of a decline in business performance; sales and operating income fall, and negative stock returns are indicators of decline. Knowing the financial solvency and prospects of a company is a critical component of corporate finance. According to the Government of India's

Department of Disinvestment, ten to fifteen percent of the total gross domestic savings were declining year on year due to low savings from CPSEs.

The following is how the paper is structured: The second section examines the related literature. The research objectives are presented in the third section. The fourth section includes information about the data and methodology used. The fifth section presents the findings from the data analysis and the results of a robustness test conducted to validate the results of logistic regression method are included in the section. In the sixth section, we summarise and conclude the paper with scope for further research.

2.0 Review of Literature

2.1 Central public sector enterprises

Several academic researches on CPSEs in India intended to examine the various areas that need improvement (Mishra, 1986; Seetharaman, 2000). Talha (1986) examined the existing trend of CPSE profitability and reached the conclusion that the CPSEs' performance was unsatisfactory and their social and economic returns were quite limited. Gilker (1999) and Seetharaman (2000) assessed the performance of the CPSEs using financial statements and financial ratios. Beena (2012) examined the financial statements and financial ratios, as well as the capital structure, investment mix, and the leader's perception. All of the preceding studies concluded with remarks about the CPSEs' poor performance. Gilker (1999); Ritu (2002) used the Altman Z score model to determine the financial health of CPSEs and concluded that the financial health of the enterprises are mostly in a distress zone.

2.2 Factors influencing the probability of financial failure and prediction model

Beaver (1966) investigated 30 financial ratios as predictors of bankruptcy and classified them into six groups. He predicted corporate bankruptcy by using multivariate and univariate analysis. Altman (1968) popularised the bankruptcy prediction model (Z-Score) by relying on the Multiple Discriminant Analysis (MDA) technique. Altman examined 22 ratios in this study, which were classified as liquidity, profitability, leverage, solvency and activity. The Z-score is an indicator that classifies companies into three distinct groups based on their score in order to determine their financial health. Ohlson (1980) conducted another such significant study in the field of bankruptcy prediction. He used the traditional logistic regression method to forecast the firm's financial health. Altman and Narayanan (1997) investigated the active role of financial ratios as well as logistic regression, MDA, and probit models in predicting failure risks. A firms' failure is the result of a whole set of endogenous as well as exogenous factors.

Following Altman's research, Beaver; McNichols & Rhie (2005) predicted bankruptcy using financial ratios from financial statements. Many scholars, however, have developed various models to study the phenomenon of bankruptcy. Dakavic *et al.*, 2010 created the statistical model for predicting Norwegian organisation bankruptcy.

The study investigates the functional relationship of financial variables. The model observed heterogeneity between different sectors in the generalised line mixed model. Barreda *et al.*, (2017) recently investigated the key financial variables that predict bankruptcy of hospitality firms in the US equity market. The study looked at both bankrupt and non-bankrupt businesses. MDA found to outperform the logit model in terms of overall bankruptcy prediction accuracy. Mu-Yen, (2011); Gregova *et al.*, (2020) have applied hybrid approaches using statistical and machine learning techniques to predict the bankruptcy.

In the present literature, we noted that very few studies were carried out on CPSEs to predict their financial status and probable failure. Based on the literature study, financial variables such as profitability, liquidity, operational efficiency, and so on were regarded as important factors for bankruptcy by the researchers. The literature also tells us how the researchers use various statistical methods to predict the failure of a sample organisation or industry.

As a result, our current study is a simple attempt to fill a gap in the study of CPSEs. Unlike in the study of other types of business models, bankruptcy is not a common occurrence in the case of CPSEs. The CPSEs must go through a revival and restructuring phase, after which they may be merged with better performing CPSEs, and if not, privatisation is the only option. As a result, it is critical to investigate the factors causing CPSEs to fail financially and to assess the model that will accurately predict the failure. By doing so, the long-term consequences of poor financial conditions can be mitigated. The findings will help the enterprises to improvise their financial health to achieve sustainability.

3.0 Research Questions

The objective is to study the factors leading to the prediction of failure and measures of sustainable financial health of selected CPSEs.

- To study the financial factors influencing the failure
- To predict the probability of failure and assess the effectiveness of the model in explaining the accuracy in predicting the failure.
- To measure the financial health of the CPSEs by using Altman's Z score model

4.0 Research Methodology and Data

4.1 Sample data selection

The study is based on data from 27 Heavy, Medium, and Light Engineering CPSEs from 2009-10 to 2018-19 using the census method of sampling (Table 1).

Table 1: List of Sample CPSEs

Sr. No.	Name of CPSEs	Category
1	Bharat Heavy Electricals Ltd.	Heavy Engineering
2	Bharat Wagon & Engg. Co. Ltd.	Heavy Engineering
3	BHEL Electrical Machines Ltd.	Heavy Engineering
4	Braithwaite & Co. Ltd.	Heavy Engineering
5	Burn Standard Company Ltd.	Heavy Engineering
6	Heavy Engineering Corpn. Ltd.	Heavy Engineering
7	Tungabhadra Steel Products Ltd.	Heavy Engineering
8	Andrew Yule & Company Ltd.	Medium & Light Engineering
9	Balmer Lawrie & Co. Ltd.	Medium & Light Engineering
10	BEL Optronics Devices Ltd.	Medium & Light Engineering
11	Bharat Dynamics Ltd.	Medium & Light Engineering
12	Bharat Electronics Ltd.	Medium & Light Engineering
13	Bharat Pumps & Compressors Ltd.	Medium & Light Engineering
14	Central Electronics Ltd.	Medium & Light Engineering
15	Electronics Corpn. Of India Ltd.	Medium & Light Engineering
16	Hindustan Cable Ltd.	Medium & Light Engineering
17	HMT Bearings Ltd.	Medium & Light Engineering
18	HMT Chinar Watches Ltd.	Medium & Light Engineering
19	HMT Ltd.	Medium & Light Engineering
20	HMT Machine Tools Ltd.	Medium & Light Engineering
21	HMT Watches Ltd.	Medium & Light Engineering
22	I T I Ltd.	Medium & Light Engineering
23	Instrumentation Ltd.	Medium & Light Engineering
24	Rajasthan Electronics And Instruments Ltd.	Medium & Light Engineering
25	Richardson & Cruddas (1972) Ltd.	Medium & Light Engineering
26	Scooters India Ltd.	Medium & Light Engineering
27	Vignyan Industries Ltd.	Medium & Light Engineering

Source: Public Enterprise Survey 2017-18: Vol. II, Government of India, New Delhi

The selected samples are further classified as either failure or non-failure (Beaver 1966; Altman, 1968; Kim & Zheng, 2006; Min & Jeong, 2009; Barreda *et al.*,

2017) (Table 2). According to BRPSE, “An enterprise is considered a failure if it has accumulated losses in any fiscal year equal to fifty percent or more of its average net worth during the four years immediately preceding such fiscal year.” In addition, an enterprise designated as a sick company under the “Sick Industrial Companies (Special Provisions) Act, 1985” (SICA) is referred to BRPSE for revival and restructure. In this paper, we have made reference to the above mentioned definition and carefully chosen those Heavy, Medium & Light Engineering Enterprises that are referred to BRPSE. These enterprises are referred to as failure sample CPSEs, while non-failure sample CPSEs are referred to as those who have made a net profit in the previous four fiscal years.

Table 2: The Number of Observations of Classification of Samples in Study Period

Year	Classification		Total
	Failure	Non-failure	
2009-10	17	10	27
2010-11	17	10	27
2011-12	20	7	27
2012-13	19	8	27
2013-14	18	9	27
2014-15	12	15	27
2015-16	11	16	27
2016-17	10	17	27
2017-18	11	16	27
2018-19	11	16	27

Source: Public Enterprise Survey Various Issues, Government of India, New Delhi

4.2 Data set

To avoid modeling issues, the financial statements in this study are derived from the PE survey published by the Department of Public Enterprises, Government of India between 2009-10 and 2018-19.

4.3 Variable collection & selection

The variables chosen for the study are based on previous research done in this field by various researchers. The ratios were chosen based on their occurrence in the literature as well as their potential relevance to the study. Table 3 displays the ratios considered as independent variables.

Table 3: The Key Independent Variables

	Variable ID	Variable	Description
Profitability	P 1	Net Profit Margin	Net Profit (PAT)/Total Sales
	P 2	Return on Assets	Net Profit (PAT)/ Total Assets
	P 3	Retained profit to total assets	retained earnings/total assets
	P 4	EBIT to total assets	Earnings before interest and taxes/total assets
	P 5	Sales to total assets	sales/total assets
Liquidity	L 1	Current ratio	Current Assets/Total Liabilities
	L 2	Working capital to Total Assets	working capital/total assets
	L 3	Total current liabilities to total assets	Total Current liabilities/Total Assets
Solvency	Sol1	Debt Equity	Shareholders fund/Total Debt
	Sol 2	Long term debt to total assets	Long term debt (Total Liabilities)/Total Assets
Managerial efficiency	M 1	Gross value added (GVA) to total assets	Gross value added (GVA)/ total assets
	M 2	Gross value added to capital employed	Gross value added/capital employed
	M 3	Sales to labour cost	Sales/Labour cost
Capital output ratio	CO	Capital output ratio	Capital investment/total output
Growth Ratio	Gr 1	Market value of equity or book value of equity to total debt/liabilities	Market value of equity or book value of equity/total debt/liabilities

Source: Authors' compilation

4.3.1 Dependent variable

The failure of the CPSE is a binary variable that considers a value of 1, a failure and 0, a non-failure CPSE.

$$y = \begin{cases} 1 & \text{failure} \\ 0 & \text{non failure} \end{cases}$$

4.4 Methods used for prediction

4.4.1 Logistic regression

Logistic regression tries to model the unilateral dependence of variables, where the explored dependent variables can be binary, ordinal, or categorical, and the predictor variable can be categorical or continuous. One such method employs a binary dependent

variable as well as a dummy variable for failure. If the CPSE is non-failure, the dummy variable is 0, and if it is a failure, it is 1.

The probability estimation of this model will be between 0 and 1.

$$(y = 1/x) = (y = 1/x_1, x_2, \dots, k) \text{ (Wooldridge, 2014).} \quad \dots (1)$$

Because the dependent variable is binary, it does not satisfy the linear regression normality assumption, linearity, and homoscedasticity of independent variables. Because failure is observed on an ordinal scale, the Logit model is the best technique. The maximising problem is estimated by determining the co-efficient that provides the highest probability of estimating dependent variables. The greater the variable x will result in increases or decreases in the probability of variable y in Logit model.

4.4 2 Altman Z score model (1968)

In the model, the Z score which is a survival indicator, classifies companies based on their solvency position. The higher the value of the Z score is, the lower the risk of bankruptcy. A low or negative Z score indicates the high likelihood of failure of a firm. Altman showed that companies with a Z score of less than 1.81 (distress zone) are highly risky and likely to go bankrupt; companies with a Z score of more than 2.99 (safe zone) are healthy and stable companies where bankruptcy is unlikely to occur. Companies that have a Z score from 1.81 to 2.99 are in the gray zone with uncertain results and bankruptcy is not easily predicted one way or the other (Altman, 1968). The original Altman Z Score (1968) is as follows:

$$Z = 0.012(X_1) + 0.014(X_2) + 0.033(X_3) + 0.006(X_4) + 0.999(X_5) \quad \dots (2)$$

Where,

X_1 = working capital/total assets,

X_2 = retained earnings/total assets,

X_3 = earnings before interest and taxes/total assets,

X_4 = market value of equity/book value of total debt,

X_5 = sales/total assets

Financial failure never happens all at once, but rather in stages: first, the output volume falls, preceded by a drop in profitability, a rise in working capital, a deterioration of the capital structure, and finally, financial failure. The summary statistics for the variables chosen for measuring and evaluating financial failure were described. Table 4 provides descriptive statistics on non-failure and failure enterprises; the scores for the relevant item are quantified for each sample CPSEs, and the appropriate item's average is taken. The average score of the CPSEs classified as failure or non-failure is then used to compute the mean, standard deviation, and variance.

Table 4: Summary Statistics

Variable ID	Non Failure			Failure		
	Mean	S D	Variance	Mean	S D	Variance
P 1	13.61	24.83	127.10	-22.78	55.05	3030.22
P 2	8.40	16.86	146.55	-76.51	269.09	72407.66
P 3	0.05	0.03	0.00	-5.41	7.87	61.93
P 4	0.08	0.09	0.01	-2.39	4.01	16.05
P 5	2.78	0.77	0.59	0.57	0.49	0.24
L 1	1.56	0.56	0.31	0.65	0.74	0.54
L 2	0.23	0.19	0.04	-1.20	2.76	7.63
L 3	0.40	0.15	0.02	2.92	2.73	7.43
Sol 1	0.02	1.92	3.69	1.01	2.40	5.77
Sol 2	0.08	0.12	0.02	6.00	16.02	256.79
M 1	0.31	0.34	0.11	0.44	1.44	2.06
M 2	54.98	84.38	7119.20	61.10	171.42	29384.69
M 3	7.41	5.80	33.67	18.84	21.25	451.53
CO	2.53	1.97	3.90	-1.48	4.87	23.75
Gr 1	0.00	0.00	0.00	1.44	3.14	9.83

Source: Authors' compilation

The descriptive statistics in Table 4, the mean value of net profit margin in non-failure CPSEs is 13.61. However, in the case of failed CPSEs, the value is -22.78. The mean value of liquidity variables also demonstrates failure CPSEs' poor performance. There is an area where failure CPSEs perform quite well; the mean value of GVA to capital employed is higher than for non-failure CPSEs. Based on the current findings, the selected CPSEs have underperformed on the chosen financial parameters, they outperform on the social front by adding gross value to the capital employed. The failure CPSEs had a higher standard deviation than the non-failure CPSEs. This suggests that failure CPSEs have higher levels of deviation and volatility in their performance. The high variance figures indicate that failure enterprises are less consistent in their financial performance. The variance results showcase ineffective and inefficient operations. There is a huge distinction in the performance. The failure CPSEs have performed poorly on all fronts. The CPSEs' weak performance is causing them to fail financially. Nevertheless, this can be subjected to further statistical analysis and measurement of the appropriate model to predict failure.

5.0 Result and Analysis

In this section, our main aim is to predict financial failure by using the logistic regression approach. In this, firstly, we start with principal component analysis to identify the factors influencing the failure.

5.1 Measure of factor influencing the probability of failure

In this section, we have identified the factors influencing financial failure through principal component analysis.

5.1.1 Principal component analysis

The KMO test measures the sample adequacy, and Bartlett's tests measure the relationship among the attributes. Table 5 represents the tests' statistics, in the study; it is 0.857 which is a good score to continue the analysis of data. Furthermore, Bartlett's test of sphericity results shows the chi-square (χ^2) statistics as 19107.138 with 540 degrees of freedom. This value is significant at a 0.05 level i.e., $p < 0.05$. Thus, the results of both the tests indicate that factor analysis may be considered an appropriate technique for analysing further data.

Table 5: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.857
Bartlett's Test of Sphericity	Approx. Chi-Square	19107.138
	Df	540
	Sig.	.000

Source: Authors' compilation

Table 6 shows the outcomes of the initial and extracted communalities. The communalities describe the proportion of variance that each variable shares with all the other variables. That is, it assesses the degree to which an attribute correlates with all the other aspects of the study. P2-Return on Assets (0.997) has the highest communalities. However, the lowest communalities are found in Gr1-Market value of equity or book value of equity to total debt/liabilities (0.630). The low communality value indicates that the variable in question is ineffective and should be removed from the factor analysis. To simplify the analysis, only variables with a communality value of 0.7 or higher were reported in this study, and variables with a communality value of less than 0.7 were dropped.

Table 6: Communalities

	Initial	Extraction
P 1	1.000	.974
P 2	1.000	.997
P 3	1.000	.981
P 4	1.000	.970
P 5	1.000	.981
L 1	1.000	.799
L 2	1.000	.942
L 3	1.000	.619
Sol 1	1.000	.769
Sol 2	1.000	.662
M 1	1.000	.644
M 2	1.000	.734
M 3	1.000	.832
CO	1.000	.861
Gr 1	1.000	.630

Source: Authors' compilation

Table 7: Total Variance Explained

Component	Initial Eigen Values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.227	34.847	34.847	5.227	34.847	34.847	5.227	34.847	34.847
2	3.499	23.327	58.173	3.499	23.327	58.173	3.499	23.327	58.173
3	1.627	10.847	69.020	1.627	10.847	69.020	1.627	10.847	69.020
4	1.389	9.260	78.280	1.389	9.260	78.280	1.389	9.260	78.280
5	1.156	7.707	85.987	1.156	7.707	85.987	1.156	7.707	85.987
6	0.703	4.687	90.673						
7	0.68	4.533	95.207						
8	0.31	2.067	97.273						
9	0.204	1.360	98.633						
10	0.137	0.913	99.547						
11	0.032	0.213	99.760						
12	0.022	0.147	99.907						
13	0.008	0.053	99.960						
14	0.005	0.033	99.993						
15	0.001	0.007	100.000						

Extraction Method: Principal Component Analysis.

Source: Authors' compilation

Furthermore, the attributes were examined for Eigen value, which is the total variance explained by each factor. In this study, we selected factors with Eigen values greater than 1.0.

Table 7 shows that there are five factors which have an Eigen value of more than 1.0 and the cumulative variance explained variance was 85.485%. Based on the analysis, we selected the first five principal components as a measure of profitability, liquidity, solvency, managerial efficiency and capital-output ratio.

Table 8: Rotated Component Matrix^a

	Component				
	1	2	3	4	5
P 1	0.815	-0.008	0.026	-0.051	-0.077
P 2	0.894	0.032	0.049	-0.439	0.04
P 3	0.978	0.025	-0.114	-0.069	0.082
P 4	0.966	0.129	-0.081	-0.062	0.099
P 5	0.964	0.116	-0.074	0.162	0.082
L 1	0.524	0.756	0.102	-0.524	0.177
L 2	0.148	0.953	0.051	0.02	0.098
L 3	-0.92	0.006	-0.013	-0.258	0.08
Sol 1	0.159	0.014	0.816	0.133	-0.245
Sol 2	-0.958	-0.129	-0.101	0.116	-0.052
M 1	-0.938	-0.102	-0.122	0.184	-0.072
M 2	0.262	-0.033	-0.128	-0.740	0.018
M 3	0.142	-0.081	0.542	0.711	0.078
CO	0.047	0.2	-0.284	-0.127	0.849
Gr 1	0.56	0.42	-0.279	0.406	-0.312

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 7 iterations.

Source: Authors' compilation

As a result, Table 8 represents the components that were rotated in the first round of Varimax rotation. The results show that, of the 15 variables chosen for the study, ten variables had factor loading values greater than 0.7 and were retained in the input vector using the Kaiser normalisation criteria, while the remaining five were eliminated because their factor loading values were less than 0.7. The experiment was then run a second time with the remaining ten variables using factor analysis. The optimal solution was not realised during the second round of factor analysis. As a result

of the above analysis, the dimension reduction of diverse financial indicators such as Return on Assets (P2), Retained Profit to Total Assets (P3), EBIT to Total Assets (P4), Net Profit Margin (P1), Sales to Total Assets (P5), Working Capital to Total Assets (L2), Current Ratio (L1), Debt Equity (Sol 1), Labour cost to sales (M3), Capital output ratio (CO) are important financial ratios which influence the financial performance of the CPSEs. These are the variables that mainly push the CPSEs towards failure if not well resulted. These critical ratios were then combined to form five major components as an indicator of profitability, liquidity, solvency, managerial efficiency, and capital-output ratio.

5.2 Logistic regression

The percentage likelihood of a corporate failure is calculated using the results of this binary model. Q_1 is the proportion of failure enterprises in the sample and H_1 is the proportion of non-failure enterprises.

$$\log L = \sum_{i=1}^N w_i \log F(q_i(\alpha_i + X_i\beta)) \quad \dots (3)$$

$$y = \begin{cases} 1 & \text{failure} \\ 0 & \text{non failure} \end{cases}$$

Table 9: Analysis of Logistic Regression

	B	S. E.	Sig.	
Profitability	1.889	1.143	.016	Significant
Liquidity	.745	.316	.027	Significant
Solvency	.168	.320	.010	Significant
Managerial efficiency	.635	.571	.019	Significant
Capital Output Ratio	-.004	.317	.989	Insignificant
Constant	.177	.410	.666	
The Cox & Snell R square value is 0.625 and Nagelkerke R square value is 0.834				

Source: Authors' compilation

The logistic regression results are shown in Table 9. The co-efficient of Capital Output Ratio (-0.004) is negatively correlated and insignificant at the 5% level of significance, as are the co-efficients of profitability (1.889), liquidity (0.745), solvency (0.168), and managerial efficiency (0.635). The p value of profitability, liquidity, solvency, and managerial efficiency is less than the 5% level of significance, i.e. $p < 0.05$, indicating that these factors have a significant impact on CPSE failure. Thus, the study shows that profitability, liquidity, solvency and managerial efficiency have a significant impact on financial failure.

The logistic regression model is further fitted using the method of maximum likelihood. The Cox & Snell R square value is 0.625 and Nagelkerke R square value is 0.834 indicating that the model may be useful in practice.

5.3 Analysis of financial health using the Altman Z-score

Table 10: Analysis of Financial Health (Z Score)

Sr. No.	Name of the CPSE	Average Z Score	Standard Deviation	Co-efficient of Variance
1	Bharat Heavy Electricals Ltd.	1.57	0.14	8.62
2	Bharat Wagon & Engg. Co. Ltd.	0.24	1.24	31.48
3	BHEL Electrical Machines Ltd.	2.08	0.33	10.81
4	Braithwaite & Co. Ltd.	1.73	0.10	9.28
5	Burn Standard Company Ltd.	1.29	0.52	12.45
6	Heavy Engineering Corpn. Ltd.	-1.02	0.20	24.06
7	Tungabhadra Steel Products Ltd.	0.01	1.01	31.01
8	Andrew Yule & Company Ltd.	2.36	0.60	25.50
9	Balmer Lawrie & Co. Ltd.	2.79	0.29	10.24
10	BEL Optronics Devices Ltd.	2.85	0.22	9.02
11	Bharat Dynamics Ltd.	3.00	0.44	15.49
12	Bharat Electronics Ltd.	1.49	0.26	17.36
13	Bharat Pumps & Compressors Ltd.	1.59	0.36	22.71
14	Central Electronics Ltd.	1.37	0.36	26.07
15	Electronics Corpn. of India Ltd.	1.56	0.55	35.33
16	Hindustan Cable Ltd.	-7.12	0.73	49.86
17	HMT Bearings Ltd.	-1.52	0.88	29.19
18	HMT Chinara Watches Ltd.	-1.98	0.20	10.24
19	HMT Ltd.	0.92	0.13	18.32
20	HMT Machine Tools Ltd.	-2.00	1.21	60.77
21	HMT Watches Ltd.	-1.53	0.98	19.24
22	I T I Ltd.	1.44	0.31	21.73
23	Instrumentation Ltd.	-0.10	0.61	29.63
24	Rajasthan Electronics And Instruments Ltd.	1.55	0.61	39.28
25	Richardson & Cruddas (1972) Ltd.	-2.25	0.25	34.21
26	Scooters India Ltd.	1.07	0.14	14.93
27	Vignyan Industries Ltd.	-3.05	0.40	37.67

Source: Authors' compilation

The Altman's Z Score is used to assess the financial health of the selected CPSEs. It is found from Table 10 that BDL (3.00) is in the safe zone ($Z > 2.99$) and

BLCL (2.79) is in the gray zone ($1.80 < Z < 2.99$), whereas BEL (1.49) falls under the distress zone ($Z < 1.80$). In the case of failure CPSEs, all failed CPSEs have registered a negative Z score (e.g. HCL (-7.12), RCL (-2.25) and Instrumentation Ltd (-0.10)) are in the distress zone and their financial health is negative.

In the next couple of years, these CPSEs are certain to fail. The results also show that only Bharat Dynamics Ltd. (Z-score=3.00) is in the safe zone and four CPSEs are falling under the gray zone. The coefficient of covariance of failure CPSEs shows the inconsistency in reporting the financial performance and financial risk. Within the sample CPSEs, we observe a significant difference in financial health.

5.4 Robustness test of the model

We applied the regression analysis in a variable Z to assess the accuracy of the model when we predict the failure. The model that sets as Z is inspired by Ohlson's (1980) logistic regression model.

$$Z = \beta_0 + \beta_1 * F1 + \beta_2 * F2 + \beta_n * Fn + \varepsilon \quad \dots (4)$$

Where $\beta_0, \beta_1, \dots, \beta_n$ are regression coefficient and ε the error terms.

$$Z = 0.177 + 1.889 * F1 + 0.745 * F2 + 0.168 * F3 + 0.635 * F4 - 0.004 * F5$$

In the model, Z represents the probability of failure $p = p(\text{failure} = 1|Z) = F(Z)$. Where F is cumulative distribution (between 0 and 1), which shows the probability for failure.

$$p = F(\beta_0 + \beta_1 * F1 + \beta_2 * F2 + \beta_n * Fn) \quad \dots (5)$$

To find p, we pretend that the cumulative distribution is logically dispersed

$$F(Z) = \frac{e^Z}{1+e} \quad \dots (6)$$

In such a case the probability p may be

$$p = \frac{1}{1+e^{-Z}} \quad \dots (7)$$

The above equation can be rewritten as

$$p(x) = \frac{e^{\beta_0 + \beta_1 F1 + \beta_2 F2 + \dots + \beta_n Fp}}{1 + e^{\beta_0 + \beta_1 F1 + \beta_2 F2 + \dots + \beta_n Fp}} \quad \dots (8)$$

The estimated probability of failure

$$p(x) = \frac{e^{0.177 + 1.889F1 + 0.745F2 + 0.168F3 + 0.635F4 - 0.004F5 + 0.177F5} * 1}{1 + e^{0.177 + 1.889F1 + 0.745F2 + 0.168F3 + 0.635F4 - 0.004F5 + 0.177F5} * 1}$$

The outcome of the failure's probability estimation the enterprise's failure probability is 0.791057.

The estimated probability of non-failure

$$p(x) = \frac{e^{0.177 + 1.889F1 + 0.745F2 + 0.168F3 + 0.635F4 - 0.004F5 + 0.177F5 * 0}}{1 + e^{0.177 + 1.889F1 + 0.745F2 + 0.168F3 + 0.635F4 - 0.004F5 + 0.177F5 * 0}}$$

The result of probability estimation, the probability of non-failure of the enterprise is 0.783033.

A confusion matrix is depicted to further analyse the accuracy of the logistic regression model. The confusion matrix summarises the classification algorithm's performance.

Table 11: Confusion Matrix of Logistic Regression

	Percentage Correct	Percentage False
Non failure	75.9	22.23
Failure	83.9	14.82

Source: Authors' compilation

As per the confusion matrix analysis (Table 11), the model's correct accuracy of predicting failure is 83.9 percent, while correct accuracy in predicting non-failure is 75.9 percent of the time. Furthermore, the results show that the logistic regression model's overall efficiency in predicting accurately is 79.9 percent. According to the results, logistic regression is a good model for prediction; however, the high percentage of error rate may result in poor classification, which should be considered carefully when using the model.

The classification results sensitivity, specificity, and total error rate of the model used in this study. In this case, sensitivity is the percentage of true failure that has been identified, and specificity is the percentage of non-failure that has been correctly identified. Logistic regression model shows, sensitivity = 18.51%, specificity = 81.48% and the total error rate = 1.481% which is quite satisfactory.

6.0 Conclusion

It is critical in financial decision-making to accurately predict business failure. In the professional and academic literature, financial failure prediction is regarded as a very important and critical topic. The CPSEs are regarded as a barometer of the Indian economy. The CPSEs should be regarded as living entities, and throughout their

existence, they can become ill, and fatal diseases can cause them financial distress. As a result, it is critical to accurately predict failure. This important phenomenon is solved by prediction models, which can vary. Furthermore, financial ratios are used as a potential predictor of failures. The study's emphasis is on the contemporary decision maker considering the results to recognise the influencing factors in order to establish the proper corrective and preventive initiatives to strengthen the CPSEs' profitability and liquidity position. The five factors (probability, liquidity solvency, managerial efficiency, and capital output ratio) were used to develop the model. The logistic regression results show that profitability, liquidity, solvency, and managerial efficiency all have a significant impact on failure and increase the risk of failure. The experimental results of logistic regression show 83.9 percent accuracy in predicting financial failure. This study raises the potential for regulatory and policy reforms, this may increase the possibility of the survival of the CPSEs. The Altman Z-score indicates that the financial health of the enterprise is very weak and soon to be bankrupt. Only four CPSEs are falling under gray zone and only Bharat Dynamics Ltd. (3.00) is in the safe zone. So it is now imperative for the policy makers, management and stakeholders to design and formulate strategies and policies to avoid failure and curb the effect of failure in the future. The results and the model discussed in this study will definitely enhance the chances of survival and better performance of the CPSEs. We argue that accurate prediction of CPSEs financial failure is critical from the standpoint of stakeholders in order to reduce the potential risk.

The models are primarily studied with the assistance of 27 CPSEs from the heavy, medium, and light manufacturing sectors. The models used in this study had a high level of accuracy in predicting the likelihood of failure. However, a large sample elaboration could improve the model's accuracy. According to the findings, a group of more quantifiable data, such as financial ratios, must be included in bankruptcy prediction, while qualitative metrics, such as symptoms of insolvency, and variables that affect financial failure, should be fully integrated for future research.

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Knowledge Hiding Behaviour, Role Stress and Moderating Effect of Affective Commitment: An Empirical Analysis

*R. Sona**

ABSTRACT

In the competitive workplace scenario, employees encounter various factors that impact their productivity and engagement. Knowledge hiding behaviour (KH) is one such factor that attracted less interest among the researchers but highly influenced the performance of the employees. This research paper aims to identify if being the victim of the knowledge hiding behaviour of a co-worker will have an impact on role stress (RS), and also strives to understand the moderating effect of affective commitment (AC) on the key study variables. The findings reveal perceived knowledge hiding behaviour has evidenced a high mean index. ANOVA was applied and it obtained that the F-value for KH and RS is significant with age, gender, and income. The correlation test determines that KH and RS have a positive correlation. The regression analysis reveals that approximately 87% of the variance of role stress was explained by perceived KH and AC moderates the relationship between KH and RS.

Keywords: *Knowledge hiding; Affective commitment; Role stress; Hybrid workplace; Employee engagement.*

1.0 Introduction

In the prevailing hybrid working environment, employees are gathered to be as a team with complementary skills and strive to accomplish the common desired goal. In such a scenario, knowledge has to be shared among the teammates to understand better and coordinate. In reality, organisations do not have the ownership of the intellectual assets of the employees, and hence, cannot pressure/insist workers transfer their intellectual knowledge to the members of the organisation. The competitive work environment has induced the members of the organisation to be self-centered and

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indulge in hiding their knowledge intentionally. Many antecedents induce an employee to involve in such behaviour while working in a common workspace. Empirical evidence suggests that role stress is pervasive in the workplace (Richards *et al.*, 2019) and knowledge hiding is a collaborative behaviour among organisational persons, thus the current research focuses on highlighting the relationship between knowledge hiding and role stress.

The empirical evidence shows the relationship of organisational factors such as leadership styles, psychological ownership of knowledge, etc., but the impact of moderators and mediators like affective commitment, reward systems are less explored. Thus, the current study investigates the moderation of affective commitment on the key variables.

1.1 Knowledge hiding

Knowledge is significant, and sharing essential organisational resources provides a greater competitive edge in this VUCA world. Knowledge sharing is a process in which individuals reciprocally share knowledge and jointly produce new sets of knowledge. On the other hand, knowledge sharing is not always assured, as it does not occur automatically in the workplace. Hence, within the framework of knowledge management, knowledge sharing behaviour has been introduced through knowledge management (KM) as sharing and transferring knowledge is deemed vital for productive behaviour.

But knowledge hiding is always a concern in any organisation. Knowledge hiding is considered to be an intentional attempt to deliver the knowledge that is requested by organisation members (Connelly *et al.*, 2012). Knowledge hiding occurs in the workplace environment for various reasons. Connelly *et al.* (2015) analysed the antecedents of knowledge hiding and classified them into three key types. First, evasive hiding (the knowledge hider decisively gives incorrect information, or assures to give more knowledge later, though there is no intention to do that). Second, playing dumb (the knowledge hider shows that he/she does not have the knowledge and is even unaware of it). Third, rationalised hiding (the knowledge hider defends his/her hiding behaviour by explaining that the requested knowledge is not shared due to confidentiality and specificity) (Connelly *et al.*, 2012).

Apart from these three factors, many other factors influence knowledge hiding. (Anand *et al.*, 2020) investigated the literature on knowledge hiding and developed a framework that is new and different from the many possible KH events investigated in the literature.

1.2 Role stress

Stress is inevitable in the workplace environment in which individuals with varied perceptions and skills work together to produce new knowledge and achieve a common goal.

Kahn *et al.*, (1964) examined that role stress is the outcome of communication and the relation between the role senders and receivers. Based on the analysis, he introduced the concept and development process of role stress. Rizzo *et al.*, (1970) referring to the Role theory, the role ambiguity (lack of necessary information required for a given position) may lead to a person being discontented with his role, experiencing anxiety and misrepresenting reality.

1.3 Affective commitment

The emotional bonding of an employee to his/her organisation is known as affective commitment (AC) and it has been proven as a vital factor of an employee's dedication and loyalty. The three-component model developed by Meyer & Allen, 1991, interprets that affectively committed employees will have a sense of belonging which thereby increases their involvement in the organisation's activities. Organisational commitment is therefore associated with various organisational factors such as absenteeism, performance, stress, and turnover.

2.0 Literature Review

2.1 Knowledge hiding

Connelly *et al.* (2012) aimed to investigate an unusual construct, knowledge hiding. Knowing that many times employees deny to share knowledge in spite of organisations facilitating the knowledge transfer, the researchers developed a multi-dimensional measure of the construct and identify several predictors of knowledge hiding in organisations. The results indicated that knowledge hiding is comprised of three key factors: evasive hiding, rationalised hiding, and playing dumb.

Boyes (2020) defines knowledge hiding as the intentional cover up of knowledge requested by another individual, whereas knowledge hoarding is defined as the accumulation of knowledge that may or may not be shared at a future period.

Mangold (2017) examined the dark side of knowledge transfer, to identify the potential antecedents and the consequences of knowledge hiding for individuals and the organisation. The researcher employed a qualitative approach using a qualitative interview to reveal participants version of knowledge hiding, and investigated why individuals withhold knowledge from their co-workers. The researcher collected

empirical data through a voluntary online survey and established a multi-level model for the antecedents of knowledge hiding and also, to understand the third-party reactions in terms of knowledge hiding behaviour.

Bari *et al.*, (2019) explained how the key factors of knowledge hiding (e.g., evasive, playing dumb, and rationalised) influence the team's creativity. The researchers attempted to draw on the social exchange theory, to know that factors of knowledge hiding have a negative relationship with team creativity, and this relationship is mediated by absorptive capacity. Moreover, knowledge hiding and team creativity moderated by the perceived mastery motivational climate (PMMC) weakens the negative relationship. Also investigated the existence of knowledge hiding practices in Pakistan through an experience survey and the result findings show that evasive hiding and playing dumb have a significant negative relationship with team creativity; on the other hand, rationalised hiding does not affect team creativity. The relationship between knowledge hiding and team creativity has not been mediated by absorptive capacity.

Ali (2021) examined the relationship between knowledge hiding and the psychological ownership of knowledge, and how this relationship is moderated by ethical leadership. A sample of 178 employees from the public universities of the Kurdistan region of Iraq was examined using a survey questionnaire. The finding indicates that there is a positive relationship between knowledge hiding and psychological ownership of knowledge; in addition, the relationship is moderated by ethical leadership.

Riaz *et al.* (2019) investigated the effect of workplace ostracism on the knowledge hiding behaviour of the employees. The researcher aimed to identify the effects of job tension as a mediator and employee loyalty as a moderator on the key constructs. A sample of 392 employees working in the textile industry was analysed using a time-lagged research design. The research findings indicated that workplace ostracism positively influences knowledge hiding behaviour such as evasive hiding and playing dumb, whereas it is not significantly related to rationalised hiding. In addition, workplace ostracism increases the feeling of job tension, and job tension mediates the relationship between workplace ostracism and knowledge hiding. Moreover, the researchers found that workplace ostracism devastated the benefits of employee loyalty.

Miminoshvili and Černe (2021) aimed to bridge the knowledge management and diversity literature to examine the knowledge hiding that occurs due to differences in demographic characteristics by the minority members. The findings revealed that minority members engage in knowledge-hiding behaviour due to exclusion experienced in the workplace. The researchers used semi-structured interviews and deductive

thematic analysis and attempted to use knowledge hiding as an inclusion strategy. As a result, knowledge hiding in the context of a diverse workforce shows that it occurs due to perceived exclusion and it takes room to improve the inclusion of minority members. The researchers also identified a new facet of knowledge-hiding characteristic ‘adjustable hiding’ for cross-cultural collaboration.

Anand *et al.* (2020) presented a review of the literature, illustrating the present and the possible knowledge hiding (KH) events that take place between employees within the organisations. The researchers found that five KH events already exist in the literature and put forward three events that may occur in the future. The proposed framework aimed to facilitate organisations and managers to develop strategies like adopting organisational change, restructuring, and increasing effective knowledge sharing among employees.

Zakariya and Bashir (2020) aimed to find out how and when the knowledge hiding opinion of the target affects the creativity of IT professionals. The researchers used temporally segregated survey-based data from IT professionals, to investigate the three-way interplay of knowledge hiding, supervisor support for creativity, and creative self-efficacy to inspect employees’ creativity. 253 respondents working in IT-based organisations were analysed revealing that the knowledge hiding perception of respondents enhances respondents’ creativity through the mechanism of benign envy.

In addition, the three-way interaction effect of supervisor support and creative self-efficacy is found to weaken the effect of knowledge hiding perception on employee creativity. The researchers further explored the mechanism of benign envy as a drive, through which employees’ knowledge hiding perception enhances creativity. The aggregate role of conditional factors that affect the knowledge hiding perception to creativity link from the employee’s perspective has also been explained.

2.2 Role stress

Sankpal *et al.* (2010) conducted a study on role stress among the bank employees in the Gwalior city and compared the various dimensions of role stress. The collected results were analysed through a Z-test to compare between the employees of public and private sector banks.

Band *et al.* (2016) examined the effects of ORS on the overall stress level of the employees in the IT companies. The results show that role overload (RO), self-role distance (SRD), and role isolation (RI) were insignificant in the stress level of the employees. Role ambiguity (RA), role erosion (RE), role expectation conflict (REC), role inadequacy (RIn) have a minor effect on the stress level of the employees. personal

inadequacy (PI), inter role distance (IRD) and role stagnation have a medium to high effect on the stress level of the employees.

Trayambak (2012) measured various stress management tools and their impact on job stress and job satisfaction. The researcher highlighted evidence from past research that there is a positive relationship between role stress and job stress and a negative relationship between job stress and job satisfaction. But some researchers found no such relationship between role ambiguity and role conflict with job satisfaction.

Garg (2015) explored the mediating role that ORS plays in the relationship between the availability of high-performance work practices (HPWPs), employee engagement, and job satisfaction. The findings confirmed that there is a positive association between the availability of HPWPs, employee engagement, and job satisfaction. In addition, ORS was found to mediate these associations significantly. Further, the study revealed the answer for one of the questions “Why the same HR practice leads to different effects on different employees?”; different levels of role stress experienced by different employees would be one of the reasons.

Trivellas *et al.* (2013) investigated the impact of job-related stress on job satisfaction among the nursing staff working in hospitals. Job stress is considered to be one of the most important workplace risks for employees, and job satisfaction has evidenced an impact on service quality and superior performance. The researchers collected a sample of 271 nurses to examine the degree to which stressors, namely interpersonal relationships, information access, conflict, workload, career development, and feedback could have an impact on various aspects of job satisfaction. The results revealed that conflict, workload, and lack of job autonomy are negatively associated with all job satisfaction aspects, however, information access and feedback had a positive relationship with employees’ satisfaction.

Singh *et al.* (2011) conducted a study among 210 managers from various private sector organisations to inspect the role stress and locus of control on job satisfaction. The results revealed that the correlation test indicated the role overload had a significant negative correlation to satisfaction with both the management and total satisfaction; whereas, role ambiguity was found to be significantly negative to the job satisfaction of the employees; and finally, role conflict was found to be significantly negative to satisfaction with both the management and total satisfaction. The results of regression analysis indicated that total stress contributed variance in explaining employee’s job satisfaction, and role conflict donated variance in explaining the employee’s total satisfaction.

Zhao and Jiang (2021) explored the social network perspective in knowledge hiding. The researchers integrated the social network theory and affective events theory to examine how positions of the individual network become persuasive borderline circumstances in the course of role stress, influencing knowledge hiding through emotional exhaustion as a mediating variable. The results determined that role stress affected knowledge hiding through emotional exhaustion.

Affective Organisational Commitment:

Chordiya *et al.* (2017) examined the factors that can influence affective organisational commitment in the cross-national context by comparing data from four states of US and India. The researchers focused on the effects of job satisfaction, on affective organisational commitment. The results revealed that job satisfaction has a significant positive impact on affective organisational commitment in both countries context. Furthermore, affective organisational commitment is significantly higher among Indian public managers compared to the four states of US.

Ohana (2016) examined the effects of co-workers procedural justice on team citizenship behaviours mediated by team affective commitment. Based on the reference from social exchange literature, the researcher confirmed that affective commitment mediates the relationship between the study variables. The result reveals that team voice is a strong and consistent predictor of team citizenship behaviours. This finding highlighted the essentiality of taking into account the ability to express one's opinion inside teams.

Meyer *et al.* (2002) conducted meta-analyses to examine the relationship between affective, continuance, and normative commitment to the organisation and also the relationship between the three types of commitment and other variables recognised as their antecedents, correlates, and consequences in Meyer & Allen's (1991) Three-component model: job satisfaction, job involvement, and occupational commitment were found to be related but they are distinguishable from one another. All three forms of commitment are negatively related to withdrawal cognition and turnover. The researchers identified that affective commitment had the strongest and most constructive correlations with organisational factors (performance, and organisational citizenship behaviour) and individual factors (stress and work-family conflict) effects.

Thanacoody *et al.* (2014) examined the mediating role played by disengagement in the relationships between emotional exhaustion, affective commitment, and turnover intentions among healthcare professionals. The result revealed that disengagement fully mediates the relationships between the study variables emotional exhaustion, affective commitment, and turnover intentions.

Salminen & Miettinen (2019) examined the moderating role of age and career stage on affective organisational commitment with the influence of perceived development opportunities and supervisory support. The results revealed that the eldest employees, those who had the longest tenure in the organisation have more affective commitment towards the organisation, thus having the highest rate of intention to remain at their current organisation. Furthermore, affective commitment was predicted by organisational tenure, skills necessary to perform present work demands, managerial support for development, and opportunities to use one's capabilities.

The empirical evidence provided above reveals that role stress is a key factor that influences organisational performance and employee engagement, thus the present study highlighted the importance for organisations to understand the impact of knowledge hiding behaviour on role stress.

3.0. Research Methodology

The present study aims to reveal the impact of perceived knowledge hiding (KH) on the role stress (RS) of the employees of IT companies. Additionally, it examines whether affective commitment (AC) moderates the relationship between KH and RS of the employees.

3.1 Research objectives

- Analyse the level of perceived KH among the employees of IT companies.
- Examine the relationship between KH and RS of the employees.
- Find the moderating effect of AC on the relationship between KH and RS of the employees.
- Analyse the impact of demographic variables on the study constructs.

Based on the research objectives the study aims to address the following research questions,

- Whether KH has a positively significant relationship with RS? Whether AC moderates this relationship?

3.2 Research hypothesis

H₁: Perceived knowledge hiding behaviour affects the role stress of employees working in the IT sector.

H₂: Affective commitment moderates the relationship between perceived knowledge hiding and role stress of employees working in the IT sector.

3.3 Variable measurement

Primary data from the employees of AI-powered IT companies were collected through a structured questionnaire. A sample size of 121(N) was measured for the empirical investigation. 12 items questionnaire to analyse KH (adapted from Connelly *et al.*, 2012), a sample item is “Told that he/she would help out later, but stalled as much as possible.”, 13 items scale to analyse RS (adapted from Peterson *et al.*, 1995), a sample item is “I often get involved in situations in which there are conflicting requirements.”; and 6 items scale to analyse AC (adapted from Meyer & Allen, 1991), a sample item is “This organization has a great deal of personal meaning for me.”

4.0 Analysis and Discussion

The demographic profile of the respondents engaged for the study is shown in (Table 1). The respondents are spread across different age groups, gender, and monthly income.

Table 1: Demographic Profile of the Respondents

Demographic Characteristics	Classification	Percentage
Age	Upto 30 years	29.8
	31-40 years	29.8
	41-50 years	22.3
	Above 50 years	18.2
	Total	100
Gender	Male	51.2
	Female	48.8
	Total	100.0
Monthly Income	Upto Rs 30,000	22.3
	Rs 30,001 – Rs 50,000	27.3
	Rs 50,001 – Rs 70,000	30.6
	Above Rs 70,000	19.8
	Total	100.0

Source: Primary Data

The reliability test result (the alpha value) of the key constructs of the study (Table 2).

The reliabilities (Cronbach’s alpha) of all the three key constructs in the context of IT employees in India are tested. As recommended by Nunnally (1978) at least 0.70 alpha coefficients for social sciences are acceptable. The internal reliabilities of the

overall scale were calculated and found that the variables are with high internal consistency and reliability (Table 2).

Table 2: Reliability Test

Variables	Cronbach's Alpha
Perceived Knowledge Hiding	.822
Role Stress	.850
Affective Commitment	.725

Source: Primary Data

The means and standard deviations of the variables under the study were calculated. Perceived Knowledge Hiding behaviour has evidenced a high mean index. The means were also evaluated considering the rating scale for each construct (Table 3).

Table 3: Descriptive Statistics

Variables	Mean	Standard Deviation
KH	37.93	14.67
RS	27.76	17.95
AC	20.26	05.45

Source: Primary Data

The difference between KH, RS and AC, and the age of the respondents were computed. The age group up to 30 years had a higher mean score (54.00) for KH, (50.50) for RS and the age group above 50 years had a higher mean score (27.63) for AC than other age groups. Analysis of variance (ANOVA) was applied to ascertain if there was a significant difference between KH, RS and AC among different age groups. The obtained F-value is significant. Hence, it was concluded that there is a statistically significant difference in KH, RS and AC among different age groups; with an increase in age, the KH, RS and AC increase (Table 4).

The difference between KH, RS and AC, and the gender of the respondents were computed. Females had a higher mean score (41.69) for KH, (31.62) for RS and males had a higher mean score (20.48) for AC than females. Analysis of variance (ANOVA) was applied to ascertain if there was a significant difference between KH, RS and AC among different genders. The obtained F-value for KH and RS is significant, whereas for AC it doesn't show any significance. Hence, it was concluded that there is a statistically significant difference in KH and RS among different genders (Table 5).

Table 4: KH, RS and AC among Different Age Groups

Age		KH	RS	AC
Up to 30 years	Mean	54	50.5	20
	N	36	36	36
	Std. Deviation	3.125928	1.681836	6.21059
31-40 years	Mean	41.36111	28.94444	17.72222
	N	36	36	36
	Std. Deviation	4.660796	9.313414	1.446397
41-50 years	Mean	31.33333	15.33333	18
	N	27	27	27
	Std. Deviation	6.928203	1.921538	4.32346
Above 50 years	Mean	14.09091	3.863636	27.63636
	N	22	22	22
	Std. Deviation	1.570838	0.83355	2.012945
Total	Mean	37.92562	27.76033	20.26446
	N	121	121	121
	Std. Deviation	14.66297	17.9453	5.449417
F Value		379.885 (.000)	425.374 (.000)	30.687 (.000)

Source: Primary Data

Table 5 KH, RS and AC Among Different Genders

Gender		KH	RS	AC
Male	Mean	34.3387	24.0806	20.4839
	N	62	62	62
	Std. Deviation	15.1495	18.2894	6.23775
Female	Mean	41.6949	31.6271	20.0339
	N	59	59	59
	Std. Deviation	13.2382	16.8757	4.51803
Total	Mean	37.9256	27.7603	20.2645
	N	121	121	121
	Std. Deviation	14.663	17.9453	5.44942
F Value		8.056 (.005)	5.549 (.020)	0.205 (.652)

Source: Primary Data

The difference between KH, RS and AC, and the income of the respondents were computed. The income group up to Rs 30,000 had a higher mean score (53.00) for KH, (50.00) for RS and the income group above Rs 70,000 (26.75) for AC than other income groups. Analysis of variance (ANOVA) was applied to ascertain if there was a significant difference between KH, RS and AC, among different income groups. The obtained F-value is significant. Hence, it was concluded that there is a statistically significant difference in KH, RS and AC, among different income groups (Table 6).

Table 6: KH, RS and AC among Different Income Group

Income		KH	RS	AC
Upto Rs 30,000	Mean	53	50	18.3333
	N	27	27	27
	Std. Deviation	3	1.6641	6.35489
Rs 30,001 – Rs 50,000	Mean	47.5758	39.9394	20.3333
	N	33	33	33
	Std. Deviation	6.47606	7.5413	3.00694
Rs 50,001 – Rs 70,000	Mean	32.2162	13.7297	17.4054
	N	37	37	37
	Std. Deviation	8.06617	4.97018	4.23254
Above Rs 70,000	Mean	16.5	7.625	26.75
	N	24	24	24
	Std. Deviation	4.42326	5.10594	2.69056
Total	Mean	37.9256	27.7603	20.2645
	N	121	121	121
	Std. Deviation	14.663	17.9453	5.44942
F Value		191.343 (.000)	406.787 (.000)	25.618 (.000)

Source: Primary Data

The correlation test was computed to know the association between the perceived knowledge hiding, role stress and affective commitment. There is a significant association between KH, RS and AC among the employees working in the IT sector (Table 7). KH and RS have shown a positive correlation, whereas, AC has shown a negative correlation between both the constructs.

The regression analysis was conducted to investigate the association between perceived knowledge hiding and role stress of the respondents. F-Test was statistically significant. The R-Squared is .87 which means that approximately 87% of the variance of role stress was explained by perceived knowledge hiding behaviour of the co-workers.

Table 7: Correlation between KH, RS and AC

	KH	RS	AC
1. KH	1		
2. RS	.937**	1	
3. AC	-.418**	-.242**	1

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

Source: Primary Data

Thus H1- Perceived knowledge hiding behaviour affects role stress of employees working in the IT sector is accepted.

The regression analysis was conducted to investigate the association between perceived knowledge hiding and role stress of the respondents moderated by the affective commitment of stakeholders. F-Test was statistically significant. The R-Squared is .90 which means that approximately 90% of the variance of role stress was explained by knowledge hiding when moderated by the affective commitment of the stakeholders. The analysis showed a significant negative relationship between the moderator and the dependent variable.

Thus H2- Affective commitment moderates the relationship between perceived knowledge hiding and role stress of employees working in the IT sector is accepted.

5.0 Conclusion

This research was conducted to analyse the influence of knowledge hiding on role stress among IT employees in India. The findings established that there is a significant relationship between the study variables which should be considered as a threat by the organisations to develop a positive organisational climate and cooperative relationships in the workplace.

5.1 Managerial implications

Knowing the rapidly changing and competitive work scenario, it is important for organisations to work on effective strategies to mitigate the impact of knowledge hiding behaviour. Decision-makers should understand the various situations in which knowledge hiding occurs and how the intentional knowledge hiding behaviour of the stakeholders would impact the creativity of the employees and the overall performance of the organisation. In view of the extensive literature search, the knowledge hiding behaviour can be lessened by designing an effective knowledge management system and also an efficient reward system which doesn't leverage the employees to gain benefits through hiding the necessary knowledge. In the hybrid workplace, to cope with AI and bots, it is important to focus on designing a positive organisational climate to improve employee relations and thereby, reduce the role stress of the employees.

5.2 Implications for future research

Future research can focus on applying the organisational factors (e.g. perceived organisation support, emotional intelligence, entrepreneurial behaviour, creativity and innovation etc.,) and factors like organisational learning, organisation climate,

organisation citizenship behaviour, leadership traits, etc., as the moderators or mediators analyse its effect on employee's individual and organisational factors. A comparative gender-based study can be designed to understand the level of knowledge hiding behaviour of different genders, which facilitates to structure the stress management model.

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The Role of Business Intelligence in Strategy Implementation in State-owned Enterprises

Mufaro Dzingirai and Rodgers Ndava***

ABSTRACT

It is interesting to note that the trendy concept of business intelligence is now at the epicenter of strategic management, particularly after the outbreak of coronavirus worldwide. Therefore, this study aims to establish the role of business intelligence in strategy implementation in state-owned enterprises. This exploratory qualitative research recruited 15 managers of state-owned enterprises in Gweru for in-depth interviews. The data was analyzed using thematic analysis. The results reveal that business intelligence enables strategy implementation through real-time performance tracking and monitoring, promoting flexibility, data accuracy enhancement, data integration, and boosting customer satisfaction. It is recommended that the management scale up business intelligence technologies, implement training and development initiatives, incorporate business intelligence into strategic planning, and continuously improve business intelligence technologies. The empirical evidence from this study is of utmost importance to the management of state-owned enterprises, practitioners and policymakers.

Keywords: *Business intelligence; Competitive advantage; Strategic management; Strategy implementation; COVID-19; State-owned enterprises.*

1.0 Introduction

It is interesting to note that the trendy concept of business intelligence is now at the epicenter of strategic management, especially after the outbreak of coronavirus across the

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globe. In this regard, the managers of both small and large companies were pressurized to embrace business intelligence technologies and tools given the implementation of lockdown measures with the purpose of containing the COVID-19 pandemic (Chaubey & Sahoo, 2021; Dwivedi *et al.*, 2020; Harris, Buckley, & Sharma, 2020; Remko, 2020). This is not surprising as we are in the Industrial Revolution (IR) 4.0 whereby advanced information technology is driving every aspect of business management. More interestingly, enterprises are now operating in a global economy where geographical boundaries are no longer a challenge since organizations can compete globally by adopting business intelligence technologies and methodologies. This suggests that the majority of the organizations are now taking advantage of the benefits of implementing business intelligence technologies and tools so as to sustain and survive in the current turbulent environment (Dwivedi *et al.*, 2020; Ranjan & Foropon, 2021; Pramanik *et al.*, 2020).

Despite the existence of criticisms related to the effectiveness of business intelligence in the context of its role and impact, the current challenging business environment characterized by the global economic crisis induced by the COVID-19 pandemic heightened the need to advance our understanding of the linkage between business intelligence and strategic management with respect to the public sector. It is worth mentioning that there is a sharp increase in the growth of the business intelligence industry (Chaubey & Sahoo, 2021; Queiroz *et al.*, 2020; Zafary, 2020). The growth of the adoption of business intelligence technologies and tools is mainly attributed to the fact that both public and private organizations are now appreciating the importance and relevance of business intelligence when it comes to contemporary strategic management (Trieu, 2017). Moreover, the successful implementation of business intelligence can allow effective communication since the correct information can be received by the right people at the right time. This will go a long way in assisting managers, both public and private, in coming up with more relevant strategies after utilizing business intelligence technologies and tools. However, from a strategic management view, it is disturbing to note that about 90% of the organizations fail to successfully implement their respective strategies.

In light of the above information, it is necessary to critically scrutinise the interaction between business intelligence and strategic management, especially during and post-COVID-19 period. Business intelligence adds value to the organization if it is aligned with corporate strategies. Despite the necessity of business intelligence at a corporate level, it is shocking to observe that most state-owned enterprises in African countries are lagging behind when it comes to the adoption of business intelligence (Amoako, 2013). Moreover, little is known about the interaction between business

intelligence and strategy implementation in the public sector (Wowczko, 2016; Spano & Bello, 2016; Boselli *et al.*, 2011). To address this inadequacy, the researchers asked the question: what is the role of business intelligence in strategy implementation in the Zimbabwean state-owned enterprises?

This paper is structured as follows: The next section mainly focuses on the literature review concerning business intelligence and strategy implementation. Section 3 describes the research methodology for this study and then results and discussion are presented in Section 4. Section 5 covers the key implications of the study and Section 6 covers the areas for further research on business intelligence and strategy implementation.

2.0 Literature Review

2.1 Conceptualization of business intelligence

There is no agreement among scholars on the meaning of business intelligence in the existing mainstream literature. According to Power (2007), business intelligence refers to a set of methods, tenets and concepts related to an improvement of the organizational decision-making process by employing fact-oriented supporting systems. Similarly, Alnoukari *et al.* (2012) described business intelligence as an approach toward management, development and dissemination of organizational information and knowledge in a manner that ensures the achievement of organizational goals.

At the heart of business intelligence is the provision of business foresight through the analysis of data from multiple sources (Sun & Wang, 2017; McMaster University, 2015). Business intelligence strategies and technologies are developed and implemented to improve or enhance evidence-based decisions. For instance, McMaster University implementation of what they called PeopleSoft, an enterprise-wide system for students that can be used to access pertinent universities fast and conveniently. The same idea can be implemented by the business community where business intelligence stakeholders' information can be processed and accessed. Based on the above definition, it can be deduced that business intelligence is based on the marriage between data mining and business knowledge with the aim to achieve sustainable business outcomes.

On the other hand, some scholars managed to take a holistic approach to defining the concept of business intelligence. In this regard, they described business intelligence as information technology tools, architectures, applications, databases, methodologies, systems and practices (Rouhani *et al.*, 2012). In this study, the

researchers are taking the above holistic definition of business intelligence. This is supported by the fact that the public sector has adopted all the above-mentioned components of business intelligence when it comes to the strategic decision-making process as well as strategy execution.

2.2 Theoretical framework

The Resource-Based View (RBV) supports this study on the role of business intelligence in strategy implementation. This theory is discussed below:

2.2.1 Resource-based view

As mentioned above, the researchers adopted the RBV as a strategic management model that captures the essence of strategic resources in gaining a competitive advantage. This model was proposed by Barney (1991) in trying to understand the sources of sustainable edge in the market. It is in this context that strategic resource, be it tangible or intangible, is difficult to imitate, valuable, rare and not easily substituted (Zica *et al.*, 2016; Ross *et al.*, 1996). In this regard, Zica *et al.* (2016) documented that innovative organizations have unique strategic resources in form of hardware and software that allow the organizations to outsmart their competitors in the market. More interestingly, the Information Technology (IT) skills of the managers are widely regarded as valuable intangible resources that can allow an organization to gain a competitive edge (Mata, Fuerst, & Barney, 1995; Ross *et al.*, 1996). With this information in mind, the researchers argued that business intelligence technologies, methodologies and practices are strategic resources of 21st-century state-owned enterprises that can ensure the realization of sustainable advantage in the market. This implies that the organizations can utilize business intelligence technologies when implementing strategies in such a way that the management can easily get reliable and evidence-based information as well as correct information in real-time.

2.3 Business intelligence in the public sector

It is an open secret that the application of business intelligence technologies, systems, practices, methodologies, or systems are spasmodically used in a variety of fields including business, finance, marketing, telecommunications, law, medicine and engineering among other disciplines. The most popular use of business intelligence technology is exemplified by the use of Mobile Device Fraud Detection and Camera Recording Systems. According to Obeidat *et al.* (2016), present-day businesses are pursuing investments in business intelligence technologies and tools as a way of implementing successful strategies that give competitive advantages. Business

intelligence gathers massive and diverse but useful information that is crucial for many aspects of the business including strategy implementation. Business intelligence is a term that is sometimes used in place of intelligence. Hence, the terms are used interchangeably but Obeidat *et al.* (2016) argues that the term competitive intelligence is more precisely an aspect of business intelligence and does not resemble all the aspects of business intelligence (Mudzana & Muharaj, 2017).

In the context of the public sector, it is disturbing to note that most public institutions are lagging behind in terms of business intelligence (Wowczko, 2016; Wang, 2014). In fact, one out of five public organizations have already embraced business intelligence in Europe and the United States of America while two out of five private organizations have already embraced business intelligence (Servers, 2007). However, the outbreak of the COVID-19 pandemic pressurized the management of public organizations to embrace business intelligence technologies and systems. Notably, business intelligence allows public organizations to enhance service delivery. As a result, managers of public institutions appear to show interest in business intelligence in an attempt to enhance their performance (Abai *et al.* 2019). With the adoption of business intelligence, public institutions can reduce operating costs, enhance service delivery, improve decision-making processes, use dashboards and scorecards to measure performance, enhance data visualization, and improve data availability (Boselli *et al.* 2011).

More interestingly, business intelligence technologies, methodologies and systems are much needed as far as strategy implementation is concerned. Hence, successful strategy implementation needs business intelligence application. According to McMaster University (2015), business intelligence helps managers as strategists to make informed and relevant decisions. Managers do not just implement strategies without having analyzed the environment. Hence, business intelligence gathers all the relevant information that is needed by strategists to come up with a final institutional decision that helps to achieve organizational goals effectively and efficiently. Business intelligence technologies and systems are used as a basis for making informed decisions when implementing strategies. The modern-day world requires the management to make relevant strategic decisions with the aid of business intelligence technology before implementing any strategy. Strategists may come up with countless strategies or blueprints that could be implemented in a bid to achieve organizational objectives but the informed decisions on what strategy to implement or not can only be made through the effective utilization of business intelligence tools and technologies (McMaster University, 2015; Sun & Wang, 2017; Sun *et al.*, 2018).

The implementation of strategies is one of the later stages in the strategic management process and this stage is based on the information gathered through business intelligence. Business intelligence should therefore give an organization a competitive advantage over rivals and competitors as the process of intelligence involves gathering, processing and interpreting data that is used as the basis for making strategic planning as well as implementation. In this regard, business intelligence gives an organization the platform to implement successful strategies based on the findings of the business intelligence research (Gaardboe & Svarre, 2018).

3.0 Challenges Faced in Adopting Business Intelligence

Despite the efforts by many organizations to incorporate business intelligence technology into the strategy execution process, a number of challenges seem to manifest, making it difficult for organizations, both public and private organizations, to fully and efficiently implement their strategies. Among the principal challenges are lack of information technology skills, lack of top management commitment, poor data quality, and user resistance to business intelligence adoption as discussed below:

3.1 Lack of information technology skills

It is well-known that most organizations, especially in Africa, do not have the human resources that are well-vested with technological know-how. This state of affairs can hamper the successful adoption of business intelligence, particularly in most state-owned enterprises in Africa. This implies that there is a need to train employees so that they can have an appreciation of business intelligence tools, technologies and practices.

3.2 Poor data quality

The quality of data collected is valuable when it comes to strategy implementation and decision making. Without accurate information or data, organizations cannot make informed decisions, especially in this technologically advanced world where change is constant and consumer preferences regularly change. Information is one of the most important components of business intelligence. The principal challenge for many businesses is to ensure that their sources of data are good and reliable before making conclusions which become the basis for decision making. Poor quality of data puts the firm at risk of making decisions based on information that is not reliable hence, some businesses implement the wrong strategies or implement the correct strategies in the wrong way. According to Mohamed (2020), firms must ensure that they have reliable and good quality data as well as excellent data warehouses so

that decisions concerning strategy implementations are made based on accurate information.

3.3 Lack of top management commitment and support

The biggest challenge that can be faced by both public and private organizations is the poor top management commitment and support towards business intelligence. For every initiative to be successful, there is an urgent need for support from the top management team. The management must provide the necessary resources and rewards as well as lead by example so that the expected benefits of business intelligence can be reaped by the organization.

3.4 User resistance to business intelligence adoption

Changes to the traditional ways of doing things are bound to face resistance. The introduction of business intelligence technologies can be accompanied by new ICT systems which can then face resistance. Organizations usually make the mistake of implementing new changes before introducing the changes to the staff or users within the organization hence, the people resist even if the new changes bring about less pressure on the workflow. According to Mohamed (2020), users of the new technology should be introduced to the new systems before the organization fully implements the changes. Users should feel empowered and not trapped by the new systems hence, the best way to go about it.

Despite the existence of criticisms related to the effectiveness of business intelligence in the context of its role and impact, the current challenging business environment characterized by the global economic crisis induced by the COVID-19 pandemic heightened the need to advance our understanding of the linkage between business intelligence and strategic management with respect to the public sector in developing countries. However, the interaction between business intelligence and strategy implementation has been neglected in mainstream literature. To address this inadequacy, the researchers asked the question: what is the role of business intelligence in strategy implementation in the Zimbabwean state-owned enterprises?

4.0 Research Methodology

The purpose of this research is to provide an exploratory inquiry into the role of business intelligence in strategy implementation in state-owned enterprises. The exploratory research design supported this study. Consistent with the exploratory

research design, this study aimed at collecting data from 25 managers from two state-owned enterprises in Gweru. These key informants were purposively selected as they have in-depth knowledge of business intelligence in their respective organizations.

Notably, in-depth interviews were used as research instruments that allow the respondents to give their business intelligence experiences. The key informants were purposively selected because of their wealth of experience in business intelligence by virtue of their relevant strategic positions within the organizations. In this regard, they were interviewed in their natural environment so as to ensure the credibility and reliability of the data collected (Creswell, 2014). Key informants from both organizations had over 10 years of experience in strategy implementation and business intelligence application.

The interviews were conducted during a time that was considered to be convenient for both the researchers and the respondents hence, some interviews were conducted during lunchtime while other interviews were conducted at the residential homes of the respondents without the interference of other office work needed to be done by the officeholders as strategic managers. Notably, Søylen (2017) also supports the use of interviews in qualitative research as the most relevant and appropriate research instrument that produces in-depth information about the phenomenon under consideration.

It is worth mentioning that data saturation was reached at the 15th key informant although the study was targeting 25 key informants. Data saturation plays a central role in qualitative study especially when interviews are conducted (Creswell, 2014). Notably, thematic analysis is the most appropriate and relevant data analysis technique that produces accurate results in qualitative research and where interviews are used as research instruments (Braun & Clarke, 2012).

5.0 Results and Discussions

From the thematic analysis, five key themes related to the role of business intelligence in strategy implementation in state-owned enterprises emerged. Generally, empirical evidence from the research confirms that state-owned enterprises are under considerable pressure due to technological advancements in other countries. Moreover, the COVID-19 pandemic increased the public sector's propensity to embrace business intelligence technologies. Nonetheless, reluctance by some strategic level managers of public institutions to harness business intelligence technologies resulted in the implementation of outdated systems and strategies that are no longer viable for business.

Specifically, the five specific themes that emerged from this qualitative study are discussed below:

5.1 Real-time performance tracking and monitoring

It was observed that business intelligence was playing an enabling role in strategy implementation through efficient performance tracking and monitoring. The key informants highlighted that the introduction of business intelligence through the “digital migration” mantra allowed the state-owned enterprises to automate their systems and methodologies in a manner that promotes efficient performance tracking and monitoring when implementing strategies as compared to the traditional way of doing business. In this respect, some key informants mentioned:

“This organization has reached greater heights of revenue collection on a yearly basis since the introduction of business intelligence technologies. Since the introduction of The Automatic Number Plate Recognition Cameras revenue collection has been made easy with compliance increasing beyond the expected levels. Most if not all vehicles passing through the tollgates have no option but to comply with ZINARA compliance expectations and there is no way they can evade paying toll fees when the dues are already captured on every transaction”. R5

“With the automation of our systems, it is now very easy for us to track the effectiveness of our strategy of revenue collection since real-time information is always available for management. For your own information, with this aspect of advancement of technology, we can easily visualize the collected data on our dashboards and then as a result I can monitor performance 24/7” R9

“I can share with you that the traditional way of assessing performance was so cumbersome. However, the current digital migration approach that was implemented in my organization allows me to access sales reports in real-time. This gives me an opportunity to monitor how efficient are we in enhancing service delivery.” R11

As indicated by some of the interview responses presented above which clearly confirmed that strategists appreciated the relevance and significance of business intelligence technologies, methodologies and practices in strategy implementation. It is noticeable that the key informants appreciated the importance of business intelligence, especially when implementing revenue collection strategies in state-owned enterprises. Moreover, one of the key informants (R11) went further to highlight that business intelligence assists the organization in augmenting service delivery in state-owned enterprises. This is in support of Boselli *et al.*, (2011) who demonstrated that the adoption of business intelligence in public institutions can enhance service delivery,

improve decision-making processes through the use of dashboards and scorecards to measure performance, enhance data visualization, and improve data availability (Boselli *et al.*, 2011).

5.2 Promoting flexibility in strategy implementation

It has been noted that the key informants appreciated the relevance of business intelligence in state-owned enterprises in the sense that business intelligence promotes flexibility in strategy implementation. In this regard, 97% of respondents confirmed the relevance of business intelligence technology in fostering strategy implementation flexibility. Notably, rigidity in strategy implementation is a threat to organizations' success because it is widely known that inflexibility can lead to the implementation of outdated strategies that are no longer relevant to the constantly changing environment. The following quotes were mentioned by the key informants in relation to the aspect of flexibility:

“Business intelligence technology is needed at all stages of the strategic management process. Information supplied through business intelligence technologies is used to make quick remedial action that is needed especially during the implementation stage so that firms do not stick to the outdated strategies that may no longer be relevant”. R2

“The major benefit of incorporating business intelligence into strategy implementation is linked to flexibility. In other words, without pertinent business intelligence technologies and practices, it is difficult to easily adjust performance indicators and prices as well as integrate information in real-time.” R4

“As you may know, agility is a core aspect when implementing strategies in a chaotic environment. This is the reason why many public institutions are now embracing business intelligence technologies so that they become flexible and learning organizations.” R8

The above evidence shows that business intelligence improves flexibility when implementing strategies, especially in a chaotic environment. This is in line with the view of Gauzelina & Bentza (2017) who underscored that business intelligence provides current and relevant information that is needed for a quick decision-making process at a strategic level. This suggests that the majority of the organization are now taking advantage of the benefits of implementing business intelligence so as to sustain and survive in the current turbulent environment (Ranjan & Foropon, 2021; Pramanik *et al.*, 2020).

5.3 Data accuracy enhancement

It emerged that the key informants were of the opinion that business intelligence was enhancing data accuracy during the strategy implementation stage when it comes to state-owned enterprises. The majority of the key informants expressed that business intelligence technologies pave way for the minimization of errors since the scanning tools reduced data capturing errors. This was confirmed by 95% of the key informants who expressed that business intelligence technology ensures data accuracy and precision during the strategy implementation stage. The following are some of the quotes from key informants with respect to data accuracy enhancement:

“Analysis of past trends helps to predict possible future demand forecasts and possible future changes in tastes and preferences of customers so that preparations can be done on time. More so, the use of technology helps to eliminate or minimize human errors when it comes to the computations of revenue generated and toll fees to be honored.” R1

“The digital migration was a good initiative in my organization. We were used to taking more time to check for data capturing errors but nowadays that is not the case. We just use scanning devices to input data into the system. By doing this, the organization is minimizing human errors and also improving efficiency.” R1

Enhancement of data accuracy has emerged as the significant role of business intelligence in strategy implementation in state-owned enterprises. This empirical evidence corroborates the view of Mohamed (2020) who highlighted that firms must apply business intelligence to ensure that they have reliable and good quality data as well as excellent data warehouses so that decisions concerning strategy implementations are made based on accurate information. Poleto *et al.*, (2015) also confirmed that business intelligence technology plays a vital role in ensuring operational efficiency.

5.4 Data integration

Data integration emerged as a key aspect of business intelligence in ensuring effective strategy implementation in state-owned enterprises. It is within this context that most of the key informants expressed their confidence in business intelligence as indicated by some of the quotes below:

“Business intelligence allows integration of data with other line ministries as you know that this organization is owned by the government. It is now easy to access some databases of public institutions that can aid our decision-making process.” R4

“The digitalization of our systems ensures synchronization of departmental information. This addresses the previous problem of organizational silos since all information is available just by a click of the button.” R7

Based on the above quotes, it is evident that the key informants expressed the significance of business intelligence when implementing business strategy. At implementation, data availability is a key aspect that can promote constant monitoring of the effectiveness of the strategy by which the management can assess whether the strategy is achieving the intended results. This is in line with the view of Sun *et al.* (2018) and Sun & Wang (2017) who suggested that the implementation of business intelligence technologies allows the management to easily access information from various functional areas of the organization.

5.5 Boosting customer satisfaction

The key informants highlighted that business intelligence plays a significant role in the sense that it boosts customer satisfaction. The majority of the key informants expressed that their organizations were previously known for poor customer satisfaction before the adoption of information technologies. Some key informants mentioned:

“It is public knowledge that my organization was facing challenges in delivering good customer service as validated by some long queues. However, in this digital era, long queues are things of the past as we are now offering our services online. Hence, our clients are very happy.” R4

“I understand that the government is starting to realize the importance of digitalization technologies because we are now receiving very few customer complaints. This is very important especially when dealing with digital natives of the 21st century.” R12

The above quotes reveal how the key informants expressed the significance of business intelligence in terms of customer satisfaction. This implies that the bottom line of adopting business intelligence technologies is to improve customer experience that can lead to customer satisfaction. This supports the view of Mohamed (2020) who documented that business intelligence enhances customer service delivery.

6.0 Recommendations

- **Scaling-up of business intelligence technologies:** The management of state-owned enterprises is recommended to scale up the adoption of business intelligence technologies. Strategic leaders should ensure that there is a conducive environment for the effective adoption of business intelligence whereby issues pertaining to

quality assurance procedures, software and security planning as well as business intelligence governance are considered.

- **Training and development:** The evidence from this study pointed to the fact that business intelligence is of utmost importance. Therefore, it is recommended that the management of state-owned enterprises should be implementing training and development related to the use of business intelligence technologies.
- **Incorporating business intelligence technologies into strategic planning:** Strategies implemented are formulated during the elementary stages of the strategic management process. It is, therefore, imperative to include the business intelligence technologies available from the beginning of the strategic planning stage so as to ensure that the implementation of strategies becomes easy since the business intelligence technologies will be compatible with the strategies to be implemented.
- **Continuous improvement of business intelligence technologies:** Although the relevance of business intelligence technologies is applauded in state-owned enterprises just like elsewhere in the private or the public sector, continuous improvement in the technology packages is needed to improve accuracy, speed and flexibility. For instance, the use of the HD Camera continues to be upgraded whereas the present-day cellphones are replacing the traditional cameramen.

6.1 Areas for future studies

This study only focused on the public sector which pave way for future research to focus on a comparative study on the role of business intelligence in strategy implementation between the private and public sectors. Moreover, researchers and practitioners interested in business intelligence could investigate the challenges faced by organizations when implementing business intelligence technologies in state-owned enterprises.

7.0 Conclusion

This study focuses on the role of business intelligence in strategy implementation in state-owned enterprises. Therefore, it adds value to the continuous debate on the significance of business intelligence, since this study focuses on the neglected area of the public sector. It has been revealed that business intelligence technologies and tools play an enabling role in strategy implementation through real-time performance tracking and monitoring, promoting flexibility, data accuracy enhancement, data integration, and boosting customer satisfaction. It is recommended

that the management scale up business intelligence technologies, implement training and development initiatives, incorporate business intelligence into strategic planning, and continuously improve business intelligence technologies. It is, therefore, concluded that business intelligence technologies and tools play an enabling role in strategy implementation.

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Employer Branding an HR Tool for Talent Acquisition

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ABSTRACT

Attracting, recruiting and selecting is the traditional and basic process of hiring potential employees within the companies. But the method of attracting the potential candidates or for being the employer of choice in context of job seekers has changed over the period of time. The idea of introducing employer brand reflects the image of the organisation and employer branding indicates developing the unique and different practices that attract new and right talent towards the company. As a result of intensified global competition and liberalisation the need for right skilled employees and war of talent has escalated at a very fast rate in a very short period of time. Hence, study of employer branding practices has become significantly important for every employer of an organisation. The paper aims to study the concept of employer branding, the practices that can be adopted by the organisation, and the psychological factors influencing these practices. This study will be very useful for HR professionals, potential employers and new researchers.

Keywords: *Employer branding practices; Employee perception; Psychological factors; Talent acquisition.*

1.0 Introduction

The current business scenario is marked with highly competitive global environment, rapid technological changes and rapid need for vast variety of competency requirements which makes it challenging for the organisations to survive and to bring success at its doorstep. Organisations need to wings spread its concept from product marketing to human resource management at much faster pace than ever before, today's organisations face significant challenges in attracting right talent to the company and

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nurturing the existent skills in the company. Employer branding is one of the vital strategies that help organisations to build strong employee value proposition through internal and external employer branding and to manage talent acquisition in a best possible way.

To build a strong employer brand, organisations must continue to engage with those factors, and present their brand image in a way that will attract people with the right skills and competencies. Productively utilise, retain and inspire their high calibre workforce and thus supporting its talent management by developing a competitive advantage in “war of talent”. Employer branding is defined as a long-term commitment to becoming the “employer of choice” and the use of branding principles and HR practises to advertise the organisation to new and current employees (Bali & Dixit, 2016).

2.0 Literature Review

In the current competitive world, where employment is the biggest challenge for every individual, not every job seeking person wants to step into your organisation, companies need to struggle to appeal, recruit, retain and motivate the greatest possible human ability. Therefore, the organisations have to build their brand secure its image and try the best strategies to keep the reputation high as possible to survive the talent crunch.

Brands are the most valuable intangible assets that company possess and as a result brand management is the major activity the firm need to focus on. Although in corporate brand firms major focus is developing their product brand which delivers a promise about its product or services to its existing as well as potential customers (Backhaus & Tikoo, 2004).

On the other side, the employer can be seen as a brand with which the employee develops a close relationship (Ambler & Barrow, 1996). Employer brand concept adds value in an organisation with respect to internal marketing, external marketing, corporate culture, and corporate reputation, these intangible assets make the important relationship between the corporation and its employees. In order for the employee to perform well and for the corporation to perform well, employees need to be aware, have positive attitudes towards the brand, trust that the ‘brand’ will support them, and demonstrate loyalty. (Ambler & Barrow, 1996).

2.1 Employer branding as a concept

The notion of ‘employer branding’ was first introduced by Ambler and Barrow in the domain of human resource management and merging the two different concepts of

brand marketing and recruitment into a single conceptual area. They saw the opportunity to attract talents to the organisation by applying the marketing techniques to the process of recruitment. According to them, “It is a combination of functional, economic, and psychological benefits offered by work and associated with the employer.” (Ambler & Barrow, 1996).

On the other hand, Sullivan defines employer branding as a multi-dimensional construct encompassing current and potential employees as well as stakeholders (O’Sullivan, 2004). According to Backhaus and Tikoo, “The process of creating a distinctive and unique employer identity and concept for the firm that distinguishes it from competitors is known as employer branding” (Backhaus & Tikoo, 2004). According to the Conference Board, “The employer brand establishes the firm’s identification as an employer.” It simply identifies the organisation as an employer, including its value system, policies, and behaviours, with the goal of attracting, keeping, and motivating current and potential employees. (Engaging Employees Through Your Brand | The Conference Board, n.d.)

These definitions indicate that employer branding is a continuous process that need to go on, even after the recruitment process is completed. Employer branding is an HR tool which uses the concept of branding as its main feature and help the firm in achieving superior talent acquisition than rest of the competitors on verge of war for talent.

Following conceptualising the employer branding, classifying the employer branding is next big hurdle that need to be cross over. There have been several attempts to classify the employer branding as internal employer branding and external employer branding.

Internal employer branding is based on the employer-employee employment relationship exchange, in which the employer delivers material and socioeconomic rewards in exchange for the employee’s loyalty and efforts (Bali & Dixit, 2016). Employer branding influences employee impressions of the organisation’s identity and culture, resulting in employee brand loyalty and, eventually, staff productivity (Backhaus & Tikoo, 2004).

External branding is the most active area of employer branding for the purpose of employee recruitment. Sullivan addressed employer branding efforts as the tool that creates the perception of external employer branding (O’Sullivan, 2004).

The employee value proposition (EVP) is at the heart of employer branding. Employer branding is built on the foundation of effective employer brands, which are apparent in an organisation’s actions and behaviours and evoke both potential and current employees through affective and practical benefits. (Bali & Dixit, 2016). It is influenced

by the principles, society, initiative, environment, and talent and incentive programmes of the firm. Internally and publicly, employment branding promotes a plausible understanding of what makes a company unique and appealing as an employer (Lievens & Slaughter, 2016).

2.2 Impact of employer branding on talent acquisition

The ultimate aim of employer branding is to maintain the key talent in an organisation. From the point of view of job seekers, in the initial stage of the decision-making process the information about the organisation is limited. Therefore, initial application decisions are heavily based on the general impressions of the attractiveness of the organisation (Trank *et al.*, 2002). Any material that job searchers examine contributes to their impressions of the employer organisation and can serve as an indicator of what it's like to work there (Turban *et al.*, 1998). As a result, firms must make extra steps to retain their image as an appealing organisation and employer in the eyes of potential employees. To make it easier to attract fresh talent and more talent to the firm, more options for selecting the best talent required by the organisation will be available, which is referred to as talent acquisition. In addition to this, in order to recruit, engage, and retain employees, employer branding is an effective tool (Barrow & Mosley, n.d.).

It gives management a consistent framework for simplifying and focusing goals, increasing efficiency, and improving recruitment, retention, and commitment. (Keefe, 2007). Constant delivery of the brand promises leads to trust and loyalty ensuring a steady supply of applicants. From the perspective of the employees, belonging to a company with a good employer brand boosts their self-esteem and strengthens their organisational affiliation. (Lievens *et al.*, 2007). It attracts the proper kind of individuals who fit in the company's culture while also assuring prospective employees of the work experience they expect. (Srivastava & Bhatnagar, 2008).

The summarising of all these definitions is rightly summed by Fernon, "A successful employer brand can produce organisational success by attracting and retaining the right talent, providing an environment in which employees embrace the brand, increasing organisational performance in the key areas of recruitment, retention, and engagement; and differentiating employers from other organisations to create a competitive edge." (Maximising the Power of the Employer Brand | WARC, n.d.).

2.3 Process of building employer branding

Employer in a firm creates employer branding through existing employees and potential candidates, this is developed with the help of internal and external employer branding respectively. In addition to this, potential candidates also receive a strong

employer brand with the help of employee value proposition, which act as a foundation for internal branding. The impact of strong employer brand results in attracting new talent towards the organisation, which provides organisation to recruit the candidate having the right skills and abilities. But the functioning of employer branding is not restricted up to recruitment, the post recruitment efforts require constant delivery of value proposition which helps in employee retention & engagement, employee satisfaction and employee motivation.

Employer branding allows a company to project a desirable brand image in the eyes of potential and current employees. Workers who have absorbed the organisation's desired brand image or employer image reflect that image to external potential employees (Bali & Dixit, 2016).

2.4 Psychological contract: Factor influencing employer branding

A second foundation for employer branding is the psychological contract theory and its impact on the employee-organisational relationship. (Backhaus & Tikoo, 2004). Employer branding has also been defined as the creation of a psychological contract between employees and the business that grows and solidifies over time as the employment relationship between the two develops. (Bali & Dixit, 2016). But in the case of employee and organisation relationship there are some obligations and conflicts that can be better understood with the help of the psychological contract. Backhaus and Tikoo argue that organisational culture and employer brand has the power to create a psychological contract between the employer and employee (Backhaus & Tikoo, 2004). These employees' perception towards the employers creates a long- term commitment towards the organisation by being "employer of choice". Employer brand is defined as 'creating the perception of a fantastic place to work in the minds of potential labour market' and 'developing an image in the minds of potential labour market' (Ewing *et al.*, 2002).

According to Schein (1965), psychological contract is the expectation every time operating in the organisations among all its members in the form of working hours, salary, compensation, flexibility, etc. and these variables have high chances to change with respect to time and circumstances (Organizational Psychology (1980 Edition) | Open Library, n.d.). This psychological contract represents a dynamic process that unfolds gradually from pre-employment onwards and throughout the different stages of employment and is termed as 'anticipatory psychological contract' (Ruchika & Prasad, 2019).

After going through the literature review, it has been summed as the study on employer branding need to be revised regularly, as employer branding is the most

dynamic concept in the scope of HR for any organisation. The research gap has been analysed that there is somewhere untapped relation that exists between psychological factors and values that influence employees for selecting employer of choice. The direct relationship between employee's perception and experience of the employer brand needs to be fulfilled. There is a need to identify some of the reliable factors of psychological contract that can help a firm to focus on major aspects to develop strong employer brand and talent acquisition.

3.0 Research Objectives

- To understand the factors influencing employer branding practices that help in increasing talent acquisition.
- To study the impact of psychological factors influencing employer branding practices on building employee's perception for before applying in a company.
- To identify the key reliable sources of psychological factor which has major impact on employee perception and further talent acquisition.
- To understand the association between respondent's age and their employment status with respect to perception towards psychological factors for employer branding practices for employer of choice.

4.0 Research Questions

- Which factors are important in influencing employer branding practices that helps in increasing talent acquisition in the company?
- Does psychological factor influence employer branding practices which have an impact on building strong employee perception?
- What are the key reliable sources of psychological factor which has a major impact on employee perception and talent acquisition?
- Is there any association between age and employment status with respect to the perception towards psychological factors for employer branding practices for employer of choice?

5.0 Research Methodology

The present research study is quantitative in nature and research design is descriptive research design. The study majorly focused on determining the impact of psychological factors on employer branding on the minds of the potential employees who are deciding to join in the organisation.

The primary data was acquired from potential employees, and they were given a standardised questionnaire to fill out. A 5-point Likert scale was used to record the responses. The sample method was convenience sampling, and the kind of sampling was non-probability sampling. A sample size of 116 potential employees has duly filled the questionnaire which has been used for data analysis. The secondary data for one of the objectives was collected through journals, articles, books, etc.

The questionnaire has been divided into 3 parts. Part A of the questionnaire contains 3 items that are demographic questions, which tells about who our respondents are. Part B of the questionnaire consists of 20 questions, which falls under psychological factors influencing employer branding practices. Lastly, Part C of the questionnaire has 2 questions that ask about respondent's perception towards psychological employer branding practices.

6.0 Analysis and Interpretation

6.1 Profile of the respondents

Table 1 represents the profile of the respondents. It depicts that the research is studied on potential employees majorly categorised into 3 factors; current employment status, gender, and age.

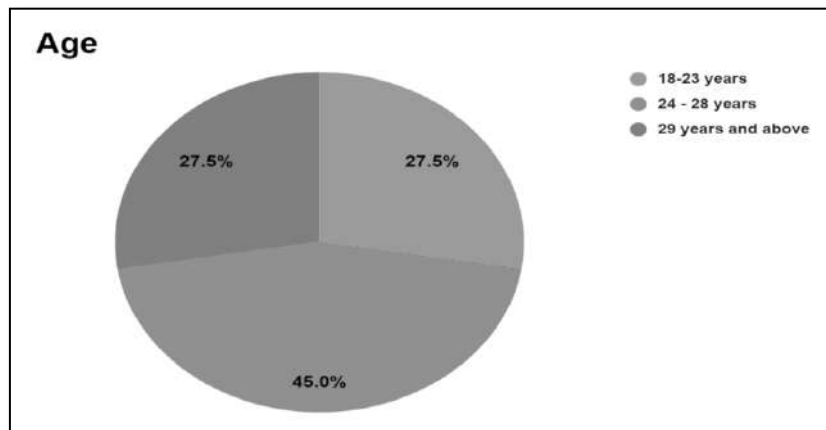
Table 1: Statistics

		Current employment status	Gender	Age
N	Valid	116	116	116
	Missing	0	0	0
Mean		2.87	1.48	2.03
Median		3.00	1.00	2.00
Mode		3	1	2
Variance		1.592	.252	.547

Source: Primary survey

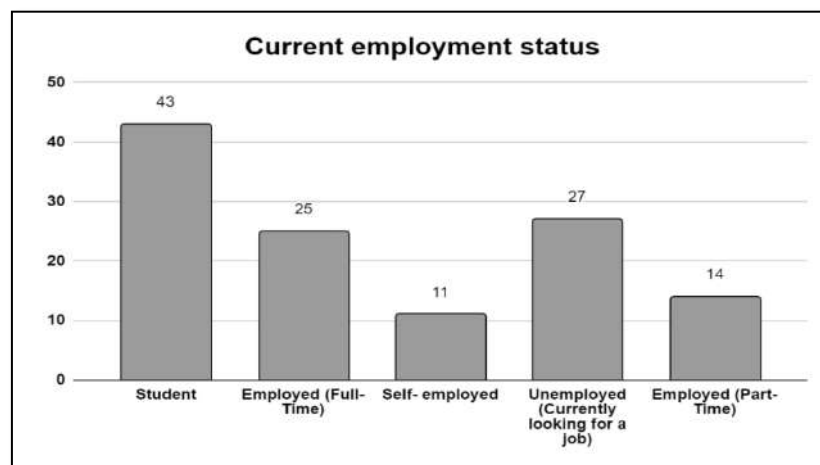
The Figure 1 represents the age of the respondents in the form of pie chart. Around 27.5 percent of the respondents were between 18 to 23 years of age, around 45 percent of the respondents were between 24 to 28 years of age and rest 27.5 percent of the respondents were of the age of 29 years and above.

Figure 1: Pie Chart Representation of Age



Source: Primary survey

Figure 2: Bar Graph Representation of Current Employment Status



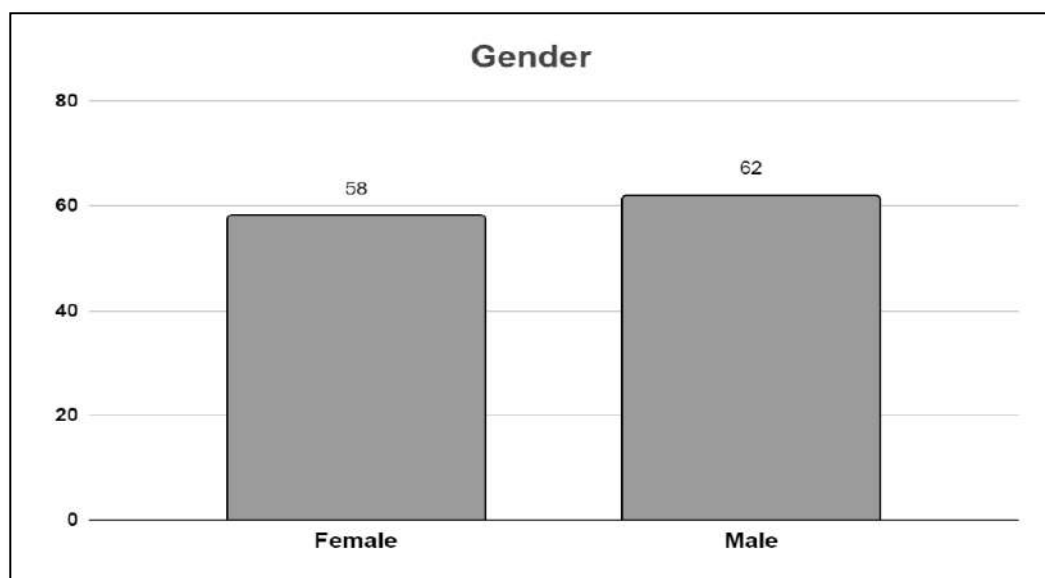
Source: Primary survey

The Figure 2 represents the current employment status of the respondents in the form of bar graph. Around 43 of the respondents are students which ultimately becomes the primary foundation for employer branding. Followed by 27 of the respondents are unemployed and which are currently looking for a job, which become the secondary foundation for the research study. Subsequently, 25 of the respondents are employed for

full-time, 14 of the respondents are employer for part-time and 11 of the respondents are self-employed.

The gender of the respondents is depicted in Figure 3 as a bar graph. There are around 62 men and 58 women among the respondents.

Figure 3: Bar Graph Representation of Gender



Source: Primary survey

6.2 Descriptive analysis of individual questions

From Tables 2 and 3, it can be inferred that before applying for a job in a company, potential employees perceive information about majorly (above mean average of 4.29) on these following psychological factors:

Employee experience, employee recognition, employee expectations met or not met, employee health & well-being, trust & respect, freedom of employee opinion, continuous learning, self - growth opportunities, collaborative decision making, exciting work environment, transparency, and fairness.

On the other hand, respondents prefer companies where employers are actively involved in developing above psychological employer branding practices to get them attracted towards the company and psychological factors are the deciding factors for potential employees to apply in the company.

Table 2: Descriptive Statistics of Employer Branding Practices Through Psychological Factors.

Descriptive Statistics			
	N	Mean	Std. Deviation
Corporate image of the company	116	3.74	.886
Employee experience	116	4.66	.604
Employee recognition	116	4.66	.561
Employee expectations met or not met	116	4.67	.540
Employee health & well-being	116	4.76	.504
Future self-image	116	3.78	.914
Proud as an employee	116	3.78	.902
Trust & Respect	116	4.40	.671
Belongingness with the workplace	116	4.73	.500
Self – confidence	116	3.47	.964
Freedom of employee opinion	116	4.83	.423
Employee autonomy	116	4.23	.738
Continuous learning	116	4.56	.608
Self - growth opportunities	116	4.61	.556
Collaborative decision making	116	4.30	.675
Happy and enjoying work culture	116	4.01	.860
Exciting work environment	116	4.34	.781
Innovative & Creative employer	116	4.19	.684
Transparency & fairness	116	4.36	.762
Ethical & moral responsibility	116	3.91	.928
Valid N (listwise)	116		

Table 3: Descriptive Statistics of Employee Perception

Descriptive Statistics				
	N	Mean	Std. Deviation	Variance
I prefer companies, where employers are actively involved in developing above practices to get them attracted towards the company	116	1.64	.665	.442
In my opinion, psychological factors like motivation, learning, perception and belief are deciding factors for potential employees to apply in the company	116	1.50	.626	.391
Valid N (listwise)	116			

6.3 Reliability test

The degree of consistency with which an instrument measures the attribute it is designed to assess is the instrument's dependability. The lower the fluctuation in repeated measurements of an attribute, the more reliable is the instrument. A measuring tool's reliability might be defined as its stability, consistency, or dependability. The degree to which an instrument measures what it is designed to measure is referred to as validity.

The reliability test was done for two sets of items in the questionnaire in order to examine the reliability and validity of the research instrument. Cronbach's alpha is 0.857, according to Table 4 above. It demonstrates the validity of the scale of psychological employer branding methods.

Subsequently, Table 5 tells us that Cronbach's alpha is 0.837. It shows the scale of employee perception is reliable.

Table 4: Reliability for Psychological Employer Branding Practices

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.857	.864	20

Table 5: Reliability for Employee Perception

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.837	.863	2

6.4 Hypothesis testing

6.4.1 Hypothesis 1

Null Hypothesis (H0) = There is no significant impact of psychological factors on the employee perception towards talent acquisition.

Alternate Hypothesis (H1) = There is a significant impact of psychological factors on the employee perception towards talent acquisition.

There was independence of residues, as assessed by a Durbin- Watson statistics of 1.722. The value is suitable for regression test (Table 6).

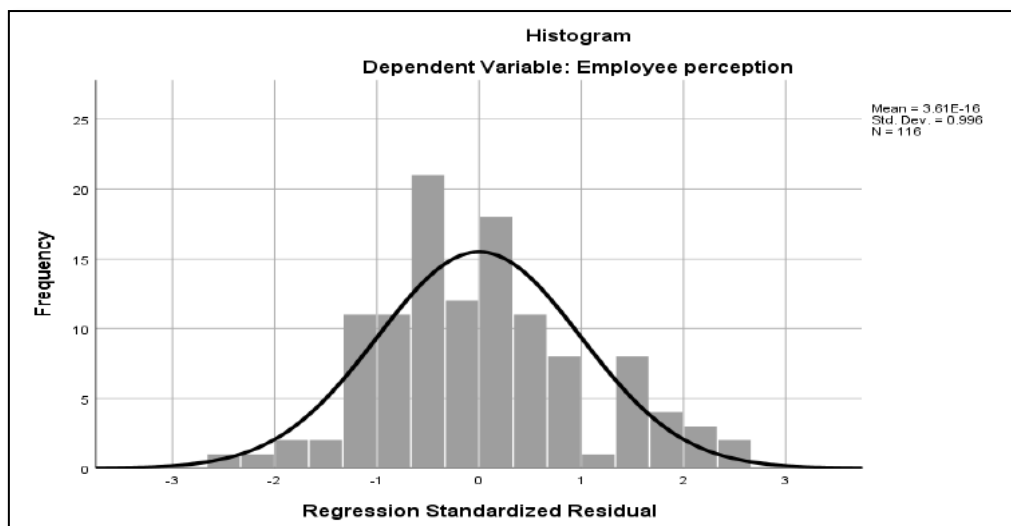
Table 6: Model Summary^b

odel	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.775 ^a	.601	.598	.552	1.722
a. Predictors: (Constant), Psychological factors					
b. Dependent Variable: Employee perception					

6.4.1.1 Regression analysis

R is multiple correlation coefficient, here in simple regression correlation. R is simply Pearson correlation coefficient between the dependent variable and independent variable. It measures the strength of association between the two variable (perception and psychological factor) $R = 0.775$, which indicates a strong correlation.

R square represents the proportion of variance in the dependent variable that can be explained by our independent variable. R square = 0.601, which in percentage = 60.1 percent. This value represents the percentage of variance in the dependent variable employee perception that can be explained by the independent variable psychological employer branding practices for talent acquisition. Adjusted R square is the percentage of variation explained by the model in the population. It corrects positive bias to provide a value that would be expected in the population. Adjusted R square = 0.598, which as a percentage = 59.8 percent.

Graph 4: Regression Standardized Residual

At adjusted R square, 59.8 percent is less than the value of R square, which is 60.1 percent, because it corrects for the positive bias in order to provide a value that you would expect in the population. Employee perception towards talent acquisition accounted for 60.1 percent of the variation in psychological factors with adjusted R square = 59.8 percent, a medium size effect according to Cohen (1988).

Residuals were normally distributed as assessed by visual inspection of a normal probability plot (Figure 4).

6.4.1.2 ANOVA test

The significance level is 0.001 which is less than 0.05. Hence null hypothesis is rejected and accept the alternate hypothesis. The null hypothesis, there is no significant impact of psychological factors on the employee perception towards talent acquisition is rejected. Therefore, we can confirm that there is a significant impact of psychological factors on the employee perception towards talent acquisition (Table 7).

Table 7: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.325	1	52.325	171.817	.000 ^b
	Residual	34.718	114	.305		
	Total	87.043	115			
a. Dependent Variable: Employee perception						
b. Predictors: (Constant), Psychological factors						

6.4.1.3 Normality test

Table 8 shows that the Shapiro-Wilk significance values are less than critical value of 0.05, which tells that the data is not normal. Hence, we need to apply chi-square test for comparing two variables.

Table 8: Tests of Normality

	Current employment status	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Employee perception	Employed (Full- Time)	.193	25	.018	.873	25	.005
	Employed (Part- Time)	.218	14	.070	.769	14	.002
	Student	.204	39	.000	.814	39	.000
	Unemployed (Currently looking for a job)	.219	27	.002	.864	27	.002
	Self- employed	.292	11	.009	.779	11	.005
a. Lilliefors Significance Correction							

Table 9 shows that the Shapiro-Wilk significance values are less than critical value of 0.05, which tells that the data is not normal. Hence, we need to apply chi-square test for comparing two variables.

Table 9: Tests of Normality

	Age	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Employee perception	18 - 23 years	.199	30	.004	.826	30	.000
	24 - 28 years	.231	53	.000	.831	53	.000
	29 years and above	.178	33	.009	.885	33	.002
a. Lilliefors Significance Correction							

6.4.2 Hypothesis 2

Null Hypothesis (H0) = There is no association between respondent's age and their perception towards psychological employer branding practices for choice of employer.

Alternate Hypothesis (H1) = There is an association between respondent's age and their perception towards psychological employer branding practices for choice of employer.

Table 10: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.037 ^a	14	.524
Likelihood Ratio	15.464	14	.347
Linear-by-Linear Association	1.130	1	.288
N of Valid Cases	116		
a. 15 cells (62.5 percent) have expected count less than 5. The minimum expected count is .26.			

The significance value = 0.524 which is greater than 0.05 (Table 10). Hence, we fail to reject the null hypothesis and cannot accept the alternate hypothesis.

Therefore, we can say that there is no association between age of the individual and their perception towards psychological employer branding practices for choice of employer.

6.4.3 Hypothesis 3

Null Hypothesis (H0) = There is no association between respondent's employment status of and their perception towards psychological employer branding practices for choice of employer.

Alternate Hypothesis (H1) = There is an association between respondent's employment status of and their perception towards psychological employer branding practices for choice of employer.

Table 11: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	39.190 ^a	28	.078
Likelihood Ratio	39.396	28	.075
Linear-by-Linear Association	.003	1	.954
N of Valid Cases	116		
a. 30 cells (75.0 percent) have expected count less than 5. The minimum expected count is .09.			

The significance value = 0.078 which is greater than 0.05 (Table 11). Hence, we fail to reject the null hypothesis and cannot accept the alternate hypothesis.

Therefore, we can say that there is no association between employment status of the individual and their perception towards psychological employer branding practices for choice of employer.

7.0 Findings and Discussions

The key findings of the study indicate that employer branding practices influencing perception for attracting potential employees through psychological factors are strongly correlated, which means that both the variables are highly dependent on each other. Change in any one variable leads to change in another variable in the same aspect. Therefore, we can say that adapting psychological employer branding practices by employers in a company can work as an effective tool at the time of talent acquisition.

Furthermore, the study discussed that age of the respondents and their employment status are not significantly associated with their perception of psychological employer branding practices before applying for a job in a company. As a result, the psychological factors described in the study invariably develop a strong perception towards the company for choice of an employer.

8.0 Recommendations

The factors influencing employer branding practices are dynamic in nature, with change in competitive environment these factors will also vary. Thus, to further improve in talent acquisition, researchers should study and find new factors that influence employer branding practices.

Earlier studies found that functional factors directly influence employer branding in the long run and further talent acquisition. But with the change in time, the assumption states that psychological factors play an effective role in influencing employee perception for choice of an employer.

Furthermore, identifying the key sources through which employers can be able to build strong employer brand is crucial to attract more and the right talent pool to the company. Also, the need to find the relation between perception and other demographic factors like employee's gender, age, marital status, employment status, etc. affecting the factors influencing employer brand are equally important for generating better talent acquisition.

9.0 Conclusion

In order to create an employer brand that is effective for attracting and hiring talent, organisations should understand factors that significantly affect how employees perceive themselves and their choice of employer.

This study has shown that employers can focus more on the psychological factors which has strong impact on employee's perception before applying for a job in a company. Also, the study tells us those factors which need to be focussed more, so that the company can be able to attract more and right talent for itself. This tends to be in contrast with available literature suggesting that the employee perception varies with the individual age group. However, we have found that there is no significant difference between individual's age and their perception as well as individual's current employment status and their perception towards employer branding practices for selecting the employer of their choice.

It is anticipated that the application of the findings of this study can be of considerable benefit to company's HRM professionals in building strong employer brand for the company for talent acquisition, followed by employee expectation, employee experience, and employee retention.

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Incorporating the Semiotic Approach into Brand Iconicity to Establish Unique Value Proposition

*Debraj Datta**

ABSTRACT

An effective advertisement is that which communicates the utility of the products of the brands to the market. In this discourse, the promotions done use signs and symbols which are so placed that the consumers can relate to them and interpret the communication. The study of signs and symbols with their accurate interpretation is called semiotics which is frequently used in advertising to signify an advertiser's message. This paper deals with showing the importance of using signs and symbols and how they help the consumers to establish a connection with the brand, resulting in buying action. Through the effective deployment of verbal, visual as well as sound aids, the company's connotation of the brand image can be complemented. These symbolic elements include logos, rituals, cultural symbols, colours, iconic individuals, text, advertisements, websites, physical environments, hospitality and service, tag lines and other "touch points".

Keywords: *Communication; Semiotics; Interpretation; Branding; Unique value proposition.*

1.0 Introduction

Branding happens to be the buzzword for marketers since the dawn of marketing. As per the American Marketing Association, branding may be defined as "A name, term, sign, symbol or design, or a combination of all these which is intended to differentiate the products offered by one seller from another." The above definition focuses on the different brand elements which distinguish the offerings of one seller from that of its rival or competitor. The brand elements which differentiate could be

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- Names such as Sony or Apple
- URLs such as shaadi.com or amazon.com
- Logos and Symbols such as the Swoosh in Nike or the Wave of Airtel
- Punchlines such as HSBC's 'World's Local Bank' or Hitachi's 'Inspire the Next'
- Characters such as Ronald of McDonald's or ZooZoo of Vodafone.

With the course of time and as more and more people are becoming brand conscious, the need of differentiation and degree of competitiveness is reaching its peak. In this context, the brand recall on behalf of the consumer is more important than just brand awareness. Thus, the organisations are shifting their focus towards a "semiotic" branding strategy rather than a traditional branding strategy. Semiotics is the study of signs and symbols and their silent communication with their intended audience. The term was first derived from the Greek letter *semeiotikos* which means the study of signs and symbols. However, in English, it was first used by Henry Stubbes in 1970.

There are three branches of Semiotics:

- Semantics: It is the study of meaning, which focuses on signifiers such as words, phrases, signs and symbols and what they actually mean.
- Syntactics: It refers to the rule governing sentence-making in linguistics.
- Pragmatics: It is the study of the relationship between the signs and symbols and their effect on people.

Although the semiotic related to branding arises from the definition stated above, it is much more specific and expected to be the future of branding (e.g., the letter called Nike is no longer written in any of the advertisements. It is just the symbol (i.e., swoosh) which signifies the brand and not the letter Nike anymore).

But what causes the brand positioning and influence on the target audience is the ability of the brand to communicate its values to its target customers. This is done by propaganda and promotional campaigns (Belch, Belch & Purani, 2010). The visuals or the graphical content of the medium compel the prospect to act in a favourable manner (Williamson, 1978).

However, researchers have agreed that the message sent by the medium is much more in terms of visual communication as compared to what actually is written in the printed advertisement (McCracken, 1987; Mick & Buhl, 1992; Leiss et al., 1997). Symbolic visual is an important part of brand development because it helps in the association of the product with the scenario, providing a symbolic meaning (Leigh & Gabel, 1992; Gustav, 2014). The visuals used in advertisements to create a difference,

exhibit messages in the form of symbolic representation than what is written along with it (Scott, 1994).

2.0 Literature Review

Marketers have duly recognised the communication aspect of the brands which directly account for the enhancement of brand equity (Aaker, 1991; Schmidt *et al*, 1995; Keller, 2007). Over the years of continuous research and understanding, the abstract aspect of brand communication, researchers (Peñaloza & Gilly, 1999; Oswald, 2010) have acknowledged the brand power and the values that are associated with the brand elements which form the preliminary base for brand communication. Sometimes it is so powerful and overwhelming that a logo or symbol may override the functional benefit and economic benefit associated with the product offered under the brand as compared to its rival competitor (Hirschman & Thompson, 1997; Holt, 2002). Semiotics associated with the brand elements either directly or indirectly provides the personality of a brand with respect to the current competitive business scenario (Mick, 1986). A brand might be defined as a system of complex signs and symbols which would be potent enough to engage the customer in an imaginary or abstract process which contributes to the tangible value of the product offering (Fournier, 1998; Holt, 2004). Analysing the communicated information of a brand logo, advertisements, and packaging in a broader sense provides a brand positioning respectively (Levi, 1959). Semiotic analysis helps the organisation to combine brand communication with the strategies for a continued brand legacy.

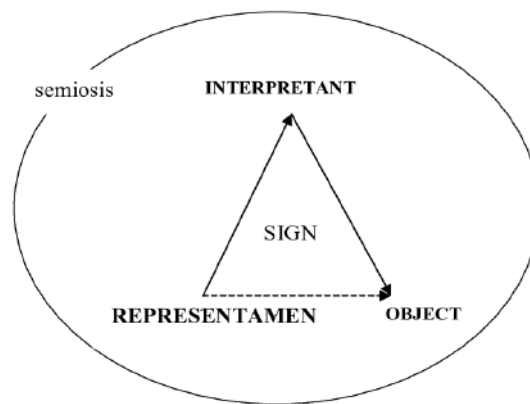
Among the eminent semioticians, Saussure and Peirce are the most respected. Where Saussure's approach is that of a linguistic focusing on the inseparability aspect of 'signified' and 'signifier' providing the intangibility aspect of a semiotics communication, Peirce's approach is that of philosophical (Peirce Triadic Semiosis) focusing on the relationship between the signs, object and interpretant (Figure 1 and Figure 2).

Therefore, after analysing both the theories in the light of brand communication, we might come up with certain points. They are:

- It suggests that there is something which is inherent with a brand which has a capability to attract and finally instil brand loyalty among the customers.
- It also suggests that there is a common community which is shared by the brand users (e.g., the Yamaha RD 350 club at Bangalore in India is a common community not only for owners of the brand but also for bike lovers, especially bike racing who also own RD 350 as well).

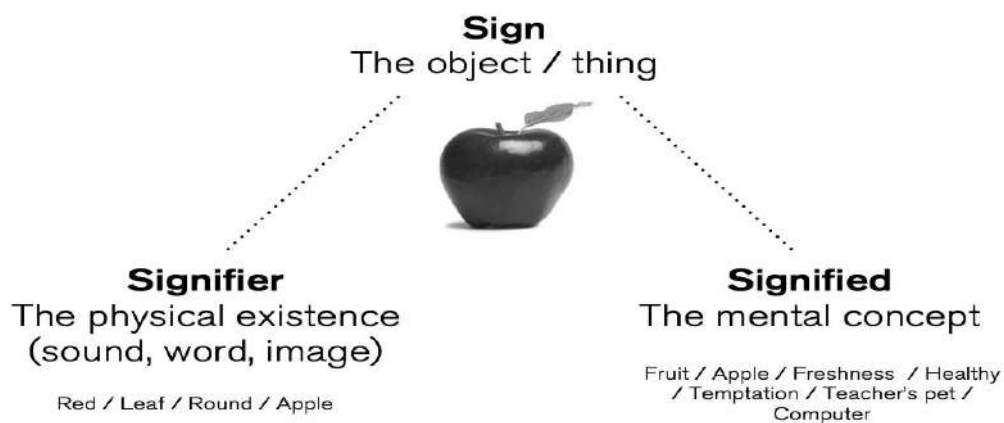
- It further suggests that branding is a complex semiotic process catering to both the emotional as well as functional aspects of the brand.
- A brand may also create an intra-subjective memory system based on its own semiotic signs and symbols.

Figure 1: Pierce's Triadic Semiotic Model



Source: https://www.researchgate.net/figure/Pierces-Semiotic-Model-Triadic-Model_fig2_327597830

Figure 2: Saussure's Approach



Source: <https://cte.univ-setif2.dz/moodle/mod/book/view.php?id=16597&chapterid=4193>

Signs and symbols as brand elements may also be a source for sensory marketing (Schmidt, 1995; Combe *et al.*, 2003; Danesi *et al.*, 2005). It is the intangible

aspect (e.g., information) embedded in the tangible thing (e.g., advertisement) which accounts for the sensory acceptability followed by heart share. For a consumer to consume the offering, it is important that proper promotion is done. Hence, as per many researchers, advertisements happen to be an important field for semiotic research. In this context, Barthes (1968) identified three types of messages in an advertisement in which the tangible copy of the photograph represented the material object, the uncoded iconic message associated with it and the coded iconic message associated with it.

Even apart from advertising, there are many areas where semiotic analysis can be done. As per Pinson (1998), semiotic approaches can be applied to packaging, store designing and other promotional activities. The main purpose of such a study is to analyse consumer behaviour towards a particular sign, symbol or artefact.

Thus, on analysing the above-stated literature, there are a few aspects which are not clearly stated. A few of those are:

- The semiotic analysis on brand perspective has not been done in the Indian market.
- The extent of influence of foreign brands over Indian brands in an Indian consumer's mind.
- For sustained brand equity, the need for change in the brand elements (semiotic analysis).

3.0 Research Questions and Objectives

The pertinent research questions are:

- Is a semiotic related to a brand potent enough to create a favourable increase in brand equity?
- Can a semiotic be considered a common platform for like-minded people?
- Can a semiotic represent the cultural association of the era?
- Should the consumer have a prior knowledge framework to comprehend semiosis?
- Which semiotic artefact should be appropriate for a certain product category?

Hence depending on the research questions stated above, the research objectives would be:

- To critically analyse the semiotic relationship between the brand and its customers.
- To critically analyse the role played by the semiotics of a brand for crafting its brand loyalty.

To analyse the current semiotic artefact of the brand and suggest improvements in it (if required) for a particular product category (automobiles, fast-food, apparels and accessories).

4.0 Research Methodology

Primary data collection was divided in four phases. The first phase involved focus group study which was followed by a survey with the help of a questionnaire, which was formulated as per the objectives stated in the proposal consisting of semiotic analysis of the brand (specially focusing on the signs and symbols). The main purpose was to check the brand association of Indian consumers in a semiotic purview (focusing on brand recall by means of semiotics associated with the brand). The third phase involved the use of the projective technique of depth interview, which involved aided, semi-aided and non-aided blind tests.

The venue of the interview and the demographic profile of the respondents were intentionally chosen to be very different from one another in order to eliminate the possibility of bias in terms of psychographic orientation, socio-cultural profiling, purchasing power and gender. The venues selected were malls, office areas, schools and sub-urban marketplace. The last phase involved the Delphi method, where the opinions of several branding and advertising professionals were sought regarding the influence of semiotics on branding and marketing communications.

The Focus Group Discussion technique was used on a cross-section design, which is a representation of a collection of data either found naturally or may be found singly at a point thereby detecting a pattern or a trend in the variables associated (Bryman & Bell, 2006). This approach was followed since it provided ample flexibility along with the opportunity to observe and document consumer reactions towards respective brands (signs and symbols) in a particular time frame.

A focus group is defined as a group of individuals selected and assembled by researchers to discuss and comment on the subjects, which could range from brand perception to the consumption patterns of products, especially complex or emotive in nature, on the basis of personal experience (Davies & Chun, 2002). Focus groups are discussions in which the moderator introduces topics in a group environment and encourages participants to engage in discussion to arrive at a certain conclusion. This type of interviewing is particularly suited for obtaining several perspectives about the same topic. Focus group discussion enables researchers to listen to myriad voices, explore newer dimensions of a complex issue and consequently gather meaningful insights which might not have been possible had the discussion not been initiated (Palomba & Banta, 1999).

Focus groups representing different linguistic, ethnic and religious communities were selected and assembled in order to discuss and comment from their personal

experience on the probable influence of semiotics in marketing communication and branding. In addition to this, the focus group study also aimed at studying whether different cultural groups interpret the advertising and other promotional campaigns in the same manner or not. All the groups under consideration were of ten people except one, which had seven members. Two differentiation parameters viz. linguistic ethnicity and religion were chosen as primary factors, which were further differentiated in gender and age. In total, seven groups were formed, out of which six focus groups were homogeneous with respect to linguistic ethnicity and religion.

Three groups consisted of only Bengalis, Marwaris and Gujaratis respectively considering linguistic ethnicity as the sole differentiation parameter whereas the other three groups had members of Hinduism, Islam and Jain religion respectively, thus considering religion as the only differentiation parameter. All these six groups had 10 people, who equally belonged to 2 gender and 5 age groups viz. 18-25, 25-35, 35-45, 45-60 and above 60. This means each group had an equal number of men and women for all 5 age groups.

In all such cases, when one cultural factor (linguistic ethnicity or religion) was chosen as a differentiation parameter, the other one was not considered. In order to avoid group think, the last group was intentionally made heterogeneous by including a mix of people from various religions and linguistic ethnic communities. The group was supposed to have 9 members, considering 3 different linguistic ethnic and religious groups each, but had to be restricted to 7 due to the unavailability of Bengali Jain and Marwari Muslim people. Gender and age were not considered individually for this case, since if had they been considered, it would have been a case of 7 ethnic-religion factors, 2 gender groups and 5 age groups together, which would have increased the group size abnormally. So, the details of the seven groups are provided in Table 1.

Table 1: Participants' Profiles of Seven Focus Groups

Group 1: Only Bengalis				
Group Members	Linguistic Ethnicity	Religion	Age	Gender
1	Bengali	Not Considered Separately	18-25	Male
2	Bengali		18-25	Female
3	Bengali		25-35	Male
4	Bengali		25-35	Female
5	Bengali		35-45	Male
6	Bengali		35-45	Female
7	Bengali		45-60	Male
8	Bengali		45-60	Female
9	Bengali		Above 60	Male
10	Bengali		Above 60	Female

Group 2: Only Marwaris				
Group Members	Linguistic Ethnicity	Religion	Age	Gender
1	Marwari	Not Considered Separately	18-25	Male
2	Marwari		18-25	Female
3	Marwari		25-35	Male
4	Marwari		25-35	Female
5	Marwari		35-45	Male
6	Marwari		35-45	Female
7	Marwari		45-60	Male
8	Marwari		45-60	Female
9	Marwari		Above 60	Male
10	Marwari		Above 60	Female
Group 3: Only Gujaratis				
Group Members	Linguistic Ethnicity	Religion	Age	Gender
1	Gujarati	Not Considered Separately	18-25	Male
2	Gujarati		18-25	Female
3	Gujarati		25-35	Male
4	Gujarati		25-35	Female
5	Gujarati		35-45	Male
6	Gujarati		35-45	Female
7	Gujarati		45-60	Male
8	Gujarati		45-60	Female
9	Gujarati		Above 60	Male
10	Gujarati		Above 60	Female
Group 4: Only Hindus				
Group Members	Religion	Linguistic Ethnicity	Age	Gender
1	Hinduism	Not Considered Separately	18-25	Male
2	Hinduism		18-25	Female
3	Hinduism		25-35	Male
4	Hinduism		25-35	Female
5	Hinduism		35-45	Male
6	Hinduism		35-45	Female
7	Hinduism		45-60	Male
8	Hinduism		45-60	Female
9	Hinduism		Above 60	Male
10	Hinduism		Above 60	Female
Group 5: Only Muslims				
Group Members	Religion	Linguistic Ethnicity	Age	Gender
1	Islam	Not Considered Separately	18-25	Male
2	Islam		18-25	Female
3	Islam		25-35	Male
4	Islam		25-35	Female
5	Islam		35-45	Male
6	Islam		35-45	Female
7	Islam		45-60	Male
8	Islam		45-60	Female
9	Islam		Above 60	Male
10	Islam		Above 60	Female

Group 6: Only Jains				
Group Members	Religion	Linguistic Ethnicity	Age	Gender
1	Jainism	Not Considered Separately	18-25	Male
2	Jainism		18-25	Female
3	Jainism		25-35	Male
4	Jainism		25-35	Female
5	Jainism		35-45	Male
6	Jainism		35-45	Female
7	Jainism		45-60	Male
8	Jainism		45-60	Female
9	Jainism		Above 60	Male
10	Jainism		Above 60	Female
Group 7: Heterogeneous				
Group Members	Linguistic Ethnicity	Religion	Age	Gender
1	Bengali	Hinduism	Not Considered Separately	Not Considered Separately
2	Bengali	Islam		
3	Marwari	Hinduism		
4	Marwari	Jainism		
5	Gujarati	Hinduism		
6	Gujarati	Jainism		
7	Gujarati	Islam		

Focus groups can be of different types depending on the subtle variations incorporated into the standard procedure. These variations are necessary as members differ widely across various groups and some amount of variation helps in eliciting a multiplicity of views and emotional processes within a group context. For the present research, two of such variations in focus groups were used as mentioned below. It may be understood from the description that both the formats were used for all the groups except one with all Bengali people, for which only the first format was found out to be sufficient due to the proficiency of the researcher in the language of discussion.

Two-way focus group: For all the groups, this was used in the middle course of discussion, where a section of the groups discussed the advertising copies they have watched and heard while the other section monitored and evaluated the key verbal and visual expressions used in the ad copy and the corresponding responses of the other group. The same process was repeated for other sets of ad copies with role reversal.

Dual-moderator group: The researcher is a Bengali-speaking person with just-manageable knowledge of Hindi and Urdu and no working knowledge of the Marwari and Gujarati languages. For the groups involving Marwari and Gujarati people and even for the other groups, the discussion involved these languages. Hence, this concept had to be used, where the researcher although still acting as a moderator was supported by another person familiar with at least one of these languages. In the case of the group involving only Gujarati people, the researcher took help from one Gujarati person. For

other groups (except for the group involving only Bengali people), the researcher was required to take help from one Marwari person conversant both in Marwari and Hindi language since it was apparent to the researcher from his experience that Hindi would have been the lingua franca for any linguistic heterogeneous group and even in case of a linguistic homogenous group of Marwaris since the young Marwaris generally feel more comfortable speaking in the Hindi language. For all such cases, the researcher was following the excitement level and non-verbal communication of the participants along with the verbal one, to whatever extent it was possible, whereas the other one noted down the important points and also ensured that the topics in the basic checklist were discussed.

For all the focus group discussions, a comfortable place was chosen. In some cases, the place happened to be the home of one of the participants whereas in other cases, it was the choice of the researcher unanimously accepted by all the group members. For all the cases, the room was examined to check whether all the facilities were in proper place. Precautions were taken to check factors like humidity, ventilation or temperature as well as closing doors or windows urgently needed to eliminate noise and other distractions. The researcher had taken a necessary back-up plan for a possible power-cut.

Once introductions were complete, the researcher moderated the discussion with the help of an outline of questions and sub-topics aided by a set of advertisements in the form of print clippings mounted on a board and also some audio-visuals with the help of a DVD player. Questions being asked in the focus group discussion were simple, specific and structured, yet open-ended as far as possible, which moved from being generic to specific (Stewart & Shamdasani, 1990). A study revealed 'what' questions to be more effective than 'why' questions (Krueger, 1994). It was remembered while designing the focus group process that questioning and probing during the discussion must not be a serial or structured interview; rather it should be a discussion of specific but loosely held topics that could lead to the core objective of the discussion. Hence, questions were primarily used to start and guide the discussion followed by appropriate practical aids to ensure that all focus group members could enjoy and participate. Listening is very important to moderate a focus group. The moderator must be familiar with the research questions and focus group discussion objectives and must focus more on active listening and proper oculesics (Greenbaum, 1998). Hence, the researcher not only listened with rapt attention but also expressed positive gestures so that the members could also understand his involvement. The key ideas in the notes were summarised, which were further examined to comprehend participants' choice of words in the context of group

dynamics, and also consistency and coherence of perceptions, attitudes and opinions among group members within and in between.

5.0 Analysis of Data

The data analysis of both primary and secondary data revealed a significant influence of semiotics on consumers' interpretation of advertisements. Even if the concept of semiotics remained the same, still its role varied from situation to situation. The application of semiotics mainly depended on a particular situation since there needed to be sync between its dimensions (symbols, signs, gestures, visual imagery, ambience and colour psychology, sound) and the given situation. The domain of semiotics seemed to have widened the mental horizon of a marketer in terms of product conceptualisation, product promotion, packaging, location advantages and marketing activities since it could integrate every element in order to maintain co-ordination. In the ever-growing competitiveness of the market dynamics, semiotics was found to be a strong element that could influence the perception, interpretation and decision-making, since it could not only create uniqueness in the value proposition but could also act as a catalyst for creating a positive impact in the minds of the customers, which could be attributed to the findings that the power of a message communicated verbally was less in comparison to that which was communicated non-verbally. Hence, it could be inferred that semiotics must be in practice to make advertisements persuasive; even an ordinary advertisement may look extraordinary by using the concept of semiotics. It could also help in leveraging a particular product in terms of its acceptability, appeal, brand recall, and customer loyalty. Since usage of semiotics was found to be quite dependent on advertisement medium for the sake of compatibility, choice of media vehicles becomes quite imperative while crafting integrated marketing communication (IMC) strategy. Different aspects of analyses are:

- **Type of Logo:** As far as type of logos is concerned, the logos are being categorised into four categories as stated above. Among all the categories, concerned logos with words and letters (40%) and combinations of both graphics and word/letters (49%) are the highest. One possible reason for the usage of a combination as compared to other categories may be the semiotic influence as well as the linguistic comprehension of the communication communicated by the logos to its intended audience.
- **Bounding:** It is also observed that the logos can also be categorised as per the bounding of the primary semiotic artefact of the logo concerned (i.e., whether the logos are bounded or not). Among all the 60 logos, it is found that the percentage of

the unbounded logos (65%) is more than the percentage of the bounded logos (35%). Approximately 1/3rd of the total sample logos is bounded which means the logos are being used along with other semiotic artefacts in a space around the logo to give it the overall meaning and the rest are unbounded.

- Capitalisation: As far as the capitalisation of logos is concerned, it is observed that among all the categories mentioned, the category stating logos with the combination is the highest (44%) followed by the logos which have capital letters (32%). Hence 2/5th of the logos are combinations as compared to others.
- Font Style: Among all the 60 logos, around 3/5th of the total logos constitute print style as far as the type of font used is concerned. This constitutes around 64% and around 1/5th constitutes script or handwriting style (22%).
- Combination of colours: As far as the colour usage is concerned, logos are being classified under 6 categories. Among the 6 categories, logos which use two colours are the highest (36%) followed by logos which use three colours (25%) and thirdly logos which use one colour (21.6%). Now of all the logos, it is observed that logos which use one, two or three colours constitute about 83% of the total logos and the rest 16.6% constitute logos which used four or more than four colours. The probable reason for using only one, two or three colours is because of an aesthetic look from the organisation's point of view and quick comprehension and recall from the consumer's point of view.
- Primary and secondary colour used: Now as far as colour used for making logos are concerned, it is observed that the majority of colour used in the logo making (as in the logo sample) is blue colour (26%) followed by red or maroon (20%).
- Usage of colour palette: As far as the colour palette is concerned, among the 6 categories, the majority of the logos from the sample have used a neutral type of palette (46.6%) followed by a strong type of palette (36.6%).
- The total number of design elements used: Among the total number of design elements, logos with one design element are the maximum among the logo sample (46.6%) followed by two elements. The major reason for such a result could be:

Phase two of the questionnaire contains seven industry verticals among which six logos are distributed in each of the seven verticals. Hence 42 logos are being studied. For such a case, Chi-Square is used because both independent variables, i.e., age/gender/educational background and the respective responses were non-parametric. The main objective is to find brand association by recognising the trend as per respective industry verticals.

5.1 Age category

Analysing the influence of age on the response of the oil and natural gas sector.

Since Chi-Square was significant ($p=.002$), it may be inferred that age has a strong influence (Cramer's $V=.348$) on the correct comprehension of the oil and natural gas sector.

Analysing the influence of age on the response of the construction and engineering sector:

Since Chi-Square was significant ($p=.005$), it may be inferred that age has a strong influence (Cramer's $V=.395$) on the correct comprehension of the construction and engineering sector.

Analysing the influence of age on the response of the automobile sector:

Since Chi-Square was significant ($p=.018$), it may be inferred that age has a strong influence (Cramer's $V=.348$) on the correct comprehension of the automobile sector.

Analysis of the influence of age on the response of the personal care sector:

Since Chi-Square was significant ($p=.047$), it may be inferred that age has an influence, although moderate (Cramer's $V=.277$) on the correct comprehension of the personal-care sector.

Analysing the influence of age on the response of the telecom sector.

Since Chi-Square was not significant ($p=.519$), it may be inferred that age has a very low influence (Cramer's $V=.165$) on the correct comprehension of the telecom sector.

Analysing the influence of age on the response of 'apparels and fashion accessories':

Since Chi-Square was significant ($p=.044$), it may be inferred that age has an influence, although moderate (Cramer's $V=.274$) on the correct comprehension of "apparels and fashion accessories"

Analysing the influence of the age on the response of 'information technology'.

Since Chi-Square was significant ($p=.001$), it may be inferred that age has a strong influence (Cramer's $V=.264$) on the correct comprehension of 'information technology'

5.2 Gender category

Analysing the influence of gender on the response of the 'oil and natural gas' sector:

Since Chi-Square was not significant ($p = .643$), it may be inferred that gender has a very low influence (Cramer's $V = .103$) on the correct comprehension of 'oil and natural gas'.

Analysing the influence of gender on the response of the 'construction and engineering sector':

Since Chi-Square was significant ($p = .005$), it may be inferred that gender has a high influence (Cramer's $V = .394$) on the correct comprehension of the 'Construction and engineering sector'.

Analysing the influence of gender on the response of the 'automobile sector':

Since Chi-Square was significant ($p = .040$), it may be inferred that gender has a marginally high influence (Cramer's $V = .225$) on the correct comprehension of the 'automobile sector'.

Analysing the influence of gender on the response of the 'personal care sector':

Since Chi-Square was significant ($p = .898$), it may be inferred that gender has no influence (Cramer's $V = .051$) on the correct comprehension of the 'personal care sector'.

Analysing the influence of gender on the response of the 'telecom sector':

Since Chi-Square was not significant ($p = .055$), it may be inferred that gender has a low influence (Cramer's $V = .264$) on the correct comprehension of the 'telecom sector'.

Analysing the influence of gender on the response of 'apparel and fashion accessories':

Since Chi-Square was significant ($p = .044$), it may be inferred that gender has a marginally high influence (Cramer's $V = .274$) on the correct comprehension of 'apparel and fashion accessories'.

Analysing the influence of gender on the response of 'information technology':

Since Chi-Square was significant ($p = .055$), it may be inferred that gender has a marginally low influence (Cramer's $V = .264$) on the correct comprehension of 'information technology'.

5.3 Educational background

Analysing the influence of educational background on the response of 'oil and natural gas':

Since Chi-Square was significant ($p = .047$), it may be inferred that educational background has a marginally high influence (Cramer's $V = .277$) on the correct comprehension of 'oil and natural gas'.

Analysing the influence of educational background on the response of ‘Construction and engineering’:

Since Chi-Square was significant ($p=.037$), it may be inferred that educational background has a high influence (Cramer’s $V=.284$) on the correct comprehension of ‘construction and engineering’.

Analysing the influence of educational background on the response of the ‘automobile sector’:

Since Chi-Square was significant ($p=.024$), it may be inferred that educational background has a high influence (Cramer’s $V=.338$) on the correct comprehension of the ‘automobile sector’.

Analysing the influence of educational background on the response of the ‘personal care sector’:

Since Chi-Square was significant ($p=.003$), it may be inferred that educational background has a very strong influence (Cramer’s $V=.493$) on the correct comprehension of ‘personal care’.

Analysing the influence of educational background on the response of the ‘telecom sector’:

Since Chi-Square was not significant ($p=.780$), it may be inferred that educational background has no influence (Cramer’s $V=.115$) on the correct comprehension of the ‘telecom sector’.

Analysing the influence of educational background on the response of ‘apparel and fashion accessories’:

Since Chi-Square was significant ($p=.012$), it may be inferred that educational background has a high influence (Cramer’s $V=.314$) on the correct comprehension of ‘apparel and fashion accessories’.

Analysing the influence of educational background on the response of the ‘information technology sector’:

Since Chi-Square was significant ($p=.002$), it may be inferred that educational background has a strong influence (Cramer’s $V=.358$) on the correct comprehension of the ‘information technology sector’.

6.0 Conclusion

The semiotic research conducted for a developing market like India clearly revealed the positioning of brands in the minds of consumers. It is evident that the Indian market is ready for semiotic experiments as far as branding is considered. The study provides a view into the minds of the consumers by analysing their recall rate.

The methodology adopted in this thesis has a professional approach of logo development with respect to marketing. The characteristics category used to classify different logos can be applied to any set of logos. Hence, it can be useful in real-life experience (e.g., analysing the logos of competitors with respect to the marketing budget and market segment). This may also help a brand manager to classify brands and help in position mapping with respect to logos as it is one of the closest parameters to judge a complex phenomenon such as the emotional benefit of a brand respectively. Analysing trends in market acceptance with respect to the corporate image is another examination where semiotic analysis is useful.

Another aspect of this research is that it can also give an insight into the usage of advertising and other promotional tools. Although the main methodology used here is 'Brand Recall' through which the responses are compared as per the category of independent variables, it also can further be researched into "Brand Positioning" and 'Brand Loyalty'. Due to the mentioned limitations (especially time), a comparison has been made with only three independent variables (i.e., age, gender and educational background). However, further independent variables can also be taken into account (e.g. professions and respective brand recognition).

The methodology adopted in this research may further be used:

- By a graphic designer for analysing the semiotic artefact of the logos in usage.
- For comparing the corporate image of an organisation with respect to those in competition.
- For developing a unique method for position mapping.
- For an organisation who wants to take the decision regarding "When to change the logo of the brand or corporation?"
- For analysing market acceptance of the corporations (i.e., corporate image) with respect to the logo recognition test.

7.0 Recommendations

As 42 logos of seven different industry verticals are being chosen and responses of the individuals (as per age, gender and educational background) are tabulated, recommendations can be made as per the seven industry verticals.

For the 'oil and natural gas' sector, there is a very strong influence of age and marginal influence by educational background as far as the responses of the respondents are concerned. However, for gender, there is low influence. For enhancing the brand equity, special schemes for professional women (e.g., doctors or government employees)

can be provided. Special medical and common ailment treatments for senior citizens can be provided at petrol pumps (especially those on highways). Apart from this, a special game zone can be provided for kids and other customers at the petrol pumps.

For the 'construction and engineering' sector, there is a high influence in all the three categories. Hence, it is evident that the sector has good brand equity with respect to brand recall. Therefore, it is important to maintain brand equity. The respective brands may allow scholarships in other sectors within the vicinity of the construction and engineering sectors (e.g., Scholarships for small children by the real-estate owners (e.g., Ambuja Realty).

For the 'automobile' sector, there is a strong influence. Hence, the respective brand owners can do special campaigns (e.g., anti-pollution) to enhance brand engagement. This will not only engage the customers but also help in continuous brand recall.

For the 'personal care products' gender does not have an influence on it which means it is necessary for the brand managers to differentiate its products as per gender (e.g., fairness cream for men and women). Age category is another important aspect where there is moderate influence. Here, fine sub-segmentations are there but it needs to be more prominent (e.g., special strawberry flavoured bubble shampoo for kids).

For the telecom sector, there is a very low influence. Hence, for increasing brand equity, special product positioning (e.g., due to special offer to the corporate executives for 3G and MNP) can be done by providing promotional offers.

For 'apparel and fashion accessories' brand equity can be enhanced by segmentation into men and women and especially kids' accessories. The brand may go for brand extensions as well (e.g., Reid and Taylor going for high-class executive fashionable shoes for men and women).

For the 'information technology' sector for enhancing brand equity, the brands (e.g., TCS, CTS) might go for the educational sector (i.e., opening engineering colleges in India).

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The Impact of Digitalisation on Employee Performance in Banking Sector

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ABSTRACT

The purpose of this research study is to find the impact of digitalisation on employee performance in the banking sector. Primary understanding has been utilised to examine the impact of digital innovation and enhancement of technology on worker's performance and it absolutely worked out that the technologies like digital payment & assortment system, cloud computing, knowledge analytics, cyber system, etc. greatly increase the productivity of employees in conjunction with time saving. It rapidly affects the work pressure on employees and ensures management over frauds and mistakes. Simple use & fast access to data permits the bank workers in downside resolution, to deliver improved ability and quality service. Those banks that implement new technology also provide correct training to its employees and which will improve their skills and performance.

Keywords: Digitalisation; Employee performance; Banking sector.

1.0 Introduction

Digital transformation is understood as improved business processes through digital technology. Digitalisation can be called as the heart of modern world; banking sector is also not an exception to the digitalisation. World is nothing without digitalisation, it has become an integral part of everyone's life. In the current fast-moving world, digitalisation is playing an important role. Countries which are adapting to digitalisation, are performing far better than the countries which are lagging in adapting digitalisation.

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Banking sector is also called as the sector of development of all other sectors, because of the financial assistance it provides for other sectors and by encouraging capital formation. Being a fast developing nation, India is lagging in implementing digitalisation to banking sector. Digitalisation of banking will bring revolution in the whole economy, but there is a need to take important steps towards digitalisation.

Talking about the employee performance, in today's world every individual has day and night access to banking all because of online banking. Managing large amount of money has become easier. Digitalisation also plays a very important role to boost the employee morale within the banks and additionally the performance by minimising the error, fraud, mistakes, and also helps to extend productivity to perform the task effectively and efficiently.

2.0 Need for Study

Any kind of technological development, like digitalisation always comes with both positive as well as negative impact on banking business. Adopting new technologies like block chain, artificial intelligence, cyber security, cloud computing, digitalised payment, deposit system, etc., helps to manage the business process and facilitate business development. It also creates challenges in the areas like strategic, financial, operational, and workforce.

The most prominent problem faced by banks is the issue of technology and human interface. To leverage the benefit of technology, the banks need to find ways to balance the two. So, there is a need to identify different human related challenges along with digitalisation factors which impact the employee performance and therefore the design and need of training and motivation is very important.

Employee performance (EP), no doubt is one of the most important assessment tools for any organisation to evaluate the effectiveness and success of any technological implementation (digitalisation). Therefore, evaluation of employee performance is a most important step in an organisation.

3.0 Research Problem

With the rise of digitalisation in the banking sector there is a need of proper training for the employees who are working in the banking sector to boost employee performance. Not all employees are good at technology hence, it is very important to get them trained accordingly.

Employees get demotivated and their morale goes down if they find digitalisation difficult to understand, and it affects the employee performance also. Digitalisation in banking sector brings lot many risks and banking frauds as well, so proper understanding and awareness of technology and cyber security is must.

In rural areas, less people use smartphones and they lack financial literacy. So, employees of banking sector in the rural areas must come up with some new approach to satisfy their customers.

Digitalisation challenges like connectivity issues, difficulty in understanding the servers and banking software will discourage and demotivate employees, if not handled properly.

4.0 Review of Literature and Hypothesis Formulation

4.1 Research objective

- Primary Objective
 - To find the relationship of digitalisation on employee performance in the banking sector
- Secondary Objective
 - To find whether people above 50 years of age find it difficult to cope up with digitalisation.
 - To find the impact of digitalisation on different levels of management.

4.2 Review of literature

With the evolution of human resource management (HRM) the development of data and communication technology (ICT) has undeniably vied a key role. There are multiple ways in which ICT has affected the role of time unit (Jeyalakshmi & Rani, 2019). Besides, sanctioning financially simpler HR work, it primarily frees up time and resources required for participating in additional strategic work. Hence within the development of HRM, ICT systems have been therefore an important tool. With the result of growing involvement of managers and alternative departments such as IT and communication within delivery of HR work, the authors have stated that this development is now blurring the definition of HR role and therefore the boundaries for the time unit operate (Roehling *et al.*, 2005). Therefore, HR practices now-a-days are not solely conducted by ancient HR professionals. Employee squares measure the internal customers and a crucial resource for banks, it has been established that favorable worker perceptions of service square measure very important for up service performance (Kelley, 1992; Reyierse & Hasker, 1992).

Digitalisation is the process of transforming information into a digital format, in which the information is organised into bits. Information technology was implemented by banks initially with the introduction of standalone PC's and voyaged to local area network (LAN) connectivity. Further, core banking platform was adopted by banks and then branch banking changed to bank banking. (Harchekar, 2018)

Digitalisation is considered to provide great efficiency when habits and work processes are changed to accommodate the possible efficiency improvements (Kuusisto, 2017). On the other hand, digitalisation policies will surely cause changes in the normal work patterns and procedures (Bastari *et al.*, 2020).

Information and communication technology enable employees to focus more and more on complex tasks which needs human knowledge, because secondary, repetitive tasks can be done automatically using computer. Studies have also suggested that digitalisation enables greater efficiency and productivity (Cijan *et al.*, 2019).

The banking sector which is also known as development of all other sectors, because of the financial assistance it provides for other sectors and thereby encouraging the capital formation. (Nayak, 2018)

4.2.1 Role of digitisation in banking

Banks are a section of our life as well as have a major role in our daily lives. For many people, day would not finish while not a minimum of one money dealings. Hence, banks perpetually try and adopt latest technologies to reinforce client expertise. Digitisation is not associate choice for banking system, rather it is inevitable because of each business being digitised and the banking sector is also not an exception. Over online banking, mobile banking is increasing at a faster rate. Because of digitalisation, paper-based payment system has been converted to paper-less payment system.

4.2.2 Advantages of digitisation in banking

The biggest advantage of digitisation is improved client expertise. Also, there is a reduction of prices for banks and customers in addition by mistreatment ATMs, cashless transactions, etc. With the help of good knowledge of digitisation with banks, they will take data-driven dynamic selections by mistreatment digital analytics. This will give advantage to all the banks and customers. Technology is non-discriminatory and everyone is going to be treated equally at banks. With the help of technology, variety of consumers is going to be more for banks. Digitalisation reduces the error which human does. Want of handling giant amount of money is going to be reduced. Gap and maintaining the bank account will be easier with the help of digitalisation. Automation eliminates the repetitive tasks and in this way rural & concrete gap is also going to be

eliminated. With the increase of cashless transactions, faux currency threats are going to be reduced. Productivity will get high and this will really bring satisfaction to the employee.

There are various technological trends in banking sector which are shown with the help of Figure 1.

Fig.1: The Banking Industry and its Digital Transformation



Source: <https://images.app.goo.gl/exvxStmUcGvXn1Z56>

4.2.3 Impact of digitalisation on employee performance

To figure out additional transparency and higher use of social networks, digital workplaces might support changes in operating designs enabling staff. Digitalisation unifies the offline and online communications by keeping the staff connected through their mobile to produce anytime, anyplace access to company data and tools. By providing workers with user expertise which they need outside the firewall, digitalisation concentrates on worker expertise. They supply flexibility, alternative, and personalisation. Also, digitalisation supports the virtual work environments which allows staff to remain connected in the distributed and virtualised work locations with equalisation client privacy and operational risk. By providing the staff with the proper tools and right data at the proper time, digitalisation minimises disbursement and enhances productivity.

Performance is the accomplishment of a given task measured against planned glorious standards of accuracy, cost, speed, and completeness. The use of technology at intervals and the moral limits undoubtedly edges the organisation, alongside improvisation in individual and cluster performance. On one side, the work done by workers reduces through the technological advancement; and on the opposite range of staff to perform a task is additionally reduced, so reducing the job opportunities. Using the human resource management department, firms use advanced technologies to examine and measure the staff performance. Unit of time department leverages rising technology to stay up with the market to drive productivity and manage human capital. The current technology trends impact unit of time area unit outsourcing and concentrate on worth that unit of time brings to the organisation. The higher service performance demand has driven a technological trend towards additional powerful, ascendible, and integrated system elements.

4.3 Summary of literature review

Digitalisation in banking sector has made the banking transactions easier because now we can do the payment by sitting at our home. It also increases the productivity and it brings satisfaction to the employees. Also, digitalisation reduces the human error and handling large amount of money also become easier. With the increase of cashless transactions, faux currency threats are going to be reduced. Mobile banking is increasing at a faster rate over online banking. Digitalisation has also improved client expertise. Digitalisation supports the virtual work environments which allows staff to remain connected in the distributed and virtualised work locations with equalisation client privacy and operational risk. Automation eliminates the repetitive tasks and this way rural & concrete gap is also going to be eliminated. Even in the current pandemic also, digitalisation has helped banks and its employees to increase the productivity and performance because everything can be done easily by sitting at home.

5.0 Research Gap Identified

No study was done earlier to find whether people above 50 years of age find it difficult to cope up with digitalisation. Also, no study was done earlier to find the impact of digitalisation on different levels of management. By using digital analytics banks can take data-driven vibrant decisions with more digital data available. This will benefit customers, bank employees, and banks also. Big data is used in banking industry for credit management to detect the fraud signals and same can also be analysed in real time using artificial intelligence. Mobile banking has made it easier for the employees of

banking sector to reach out to the customers easily and frequently. Digitalisation has reduced the rural urban gap as well, helping employees of rural areas to improve their performance by satisfying the customer needs quickly.

6.0 Hypothesis

Hypothesis 1

Null Hypothesis:

H_0 = There is no relationship of digitalisation on employee performance in the banking sector.

Alternate Hypothesis:

H_1 = There is a strong positive correlation of digitalisation on employee performance in the banking sector.

Hypothesis 2

Null Hypothesis:

H_0 = The people above 50 years of age do not find it difficult to cope up with digitalisation.

Alternate Hypothesis:

H_1 = The people above 50 years of age find it difficult to cope up with digitalisation.

Hypothesis 3

Null Hypothesis:

H_0 = There is no difference of digitalisation on different levels of management.

Alternate Hypothesis:

H_1 = There is a difference of digitalisation on different levels of management.

7.0 Research Methodology

- Sample size: 121
- Research type: Quantitative research
- Research instrument used: Questionnaire / Interview format & logic:

I have collected the data from the employees of 9 banks including SBI, Union Bank of India, ICICI Bank, HDFC Bank, Axis Bank, Kotak Mahindra Bank, Indian Overseas Bank, Bank of Baroda, and Allahabad Bank. I have used Likert scale for asking the questions. I asked the employees about their age and their job position. Based on the response which they gave, I completed the data analysis.

- Sampling method: - Random sampling
- Type of scale: - Likert Scale
 - (Strongly Agree - 1, Moderately Agree - 2, Mildly Agree - 3, Neither Agree nor Disagree - 4, Mildly Disagree - 5, Moderately Disagree - 6, Strongly Disagree - 7)
- Data collection method: - Primary
- Area of research: - Banking sector
- Statistical tool: - SPSS Version 21

8.0 Data Analysis, Interpretation and Hypothesis Testing

8.1 Reliability of scales used

8.1.1 Scale: digitalisation scale

Table 1: Case Processing Summary

		N	%
Cases	Valid	121	100.0
	Excluded	0	.0
	Total	121	100.0
a. Listwise deletion based on all variables in the procedure.			

Table 2: Reliability Statistics

Cronbach's Alpha	N of Items
.844	8

Conclusion: Here, value of Cronbach's Alpha is 0.844 which is greater than 0.7, therefore digitalisation scale is reliable (Table 1 and 2).

8.1.2 Scale: Employee performance scale

Table 3: Case Processing Summary

		N	%
Cases	Valid	121	100.0
	Excluded	0	.0
	Total	121	100.0
a. Listwise deletion based on all variables in the procedure.			

Table 4: Reliability Statistics

Cronbach's Alpha	N of Items
.826	7

Conclusion: Here, value of Cronbach's Alpha is 0.826 which is greater than 0.7, therefore employee performance scale is reliable (Table 3 and 4).

8.2 Normality

8.2.1 Scale: Digitalisation scale

Table 5: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Digitalisation	121	100.0%	0	0.0%	121	100.0%

Table 6: Descriptive Statistics

Digitalisation	Mean		Statistic	Std. Error
	Mean		14.4876	.45168
	95% Confidence Interval for Mean	Lower Bound	13.5933	
		Upper Bound	15.3819	
	5% Trimmed Mean		14.2920	
	Median		14.0000	
	Variance		24.685	
	Std. Deviation		4.96843	
	Minimum		8.00	
	Maximum		25.00	
	Range		17.00	
	Interquartile Range		6.50	
	Skewness		.568	.220
	Kurtosis		-.681	.437

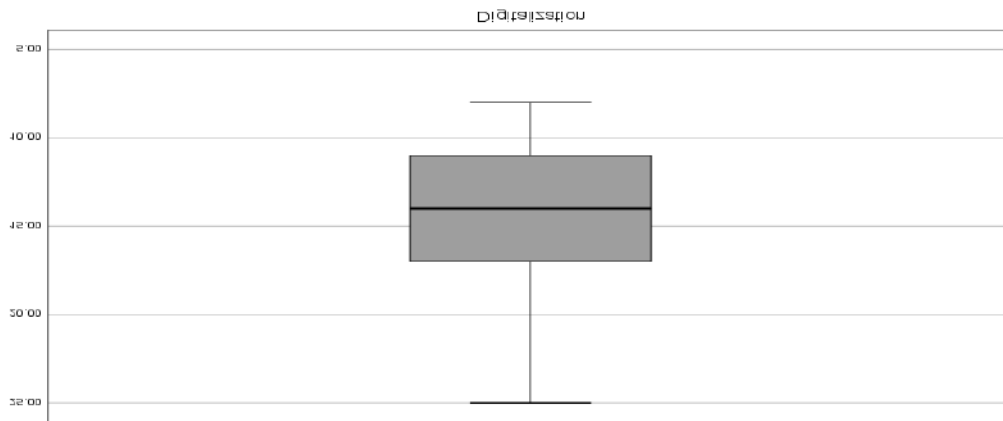
Table 7: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Digitalisation	.120	121	.000	.926	121	.000

a. Lilliefors Significance Correction

Conclusion: Here, value of skewness is 0.568 and value of kurtosis is -0.681 which is less than 3, therefore it can be concluded that digitalisation scale follows a normal distribution (Table 5 to 7).

Figure 2: Boxplot for Digitalisation Scale



Conclusion: The boxplot shows that there were no outliers for digitalisation (Figure 2).

8.2.2 Scale: Employee performance scale

Table 8: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Employee Performance	121	100.0%	0	0.0%	121	100.0%

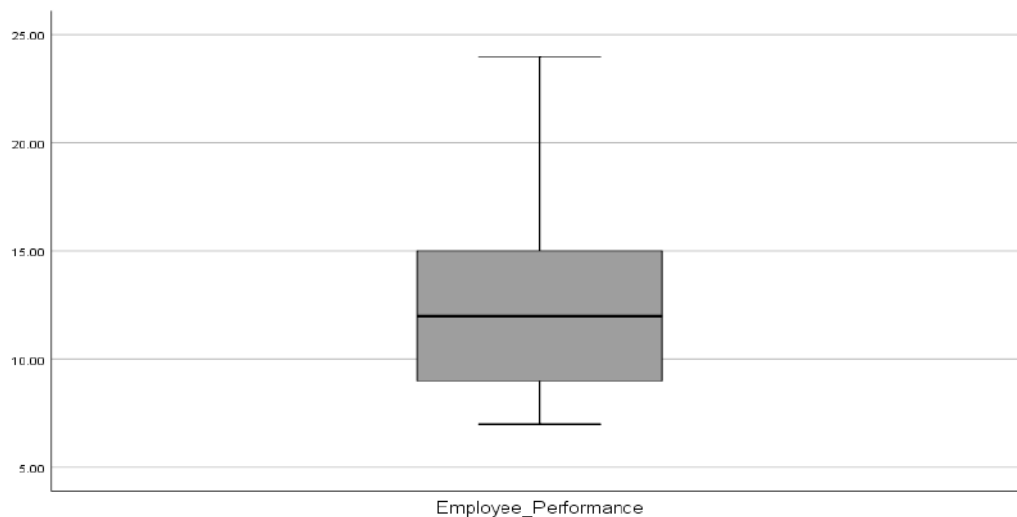
Table 9: Descriptive

			Statistic	Std. Error
Employee Performance	Mean		12.7355	.43658
	95% Confidence Interval for Mean	Lower Bound	11.8711	
		Upper Bound	13.5999	
	5% Trimmed Mean		12.4288	
	Median		12.0000	
	Variance		23.063	
	Std. Deviation		4.80238	
	Minimum		7.00	
	Maximum		24.00	
	Range		17.00	
	Interquartile Range		6.00	
	Skewness		.751	.220
	Kurtosis		-.155	.437

Table 10: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Employee Performance	.116	121	.000	.916	121	.000
a. Lilliefors Significance Correction						

Conclusion: Here, value of skewness is 0.751 and value of kurtosis is -0.155 which is less than 3, therefore it can be concluded that employee performance scale follows a normal distribution (Table 8 to 10).

Figure 3: Boxplot for Employee Performance Scale

Conclusion: The boxplot shows that there were no outliers for employee performance (Figure 3).

8.3 Hypothesis Testing

8.3.1 Hypothesis 1.

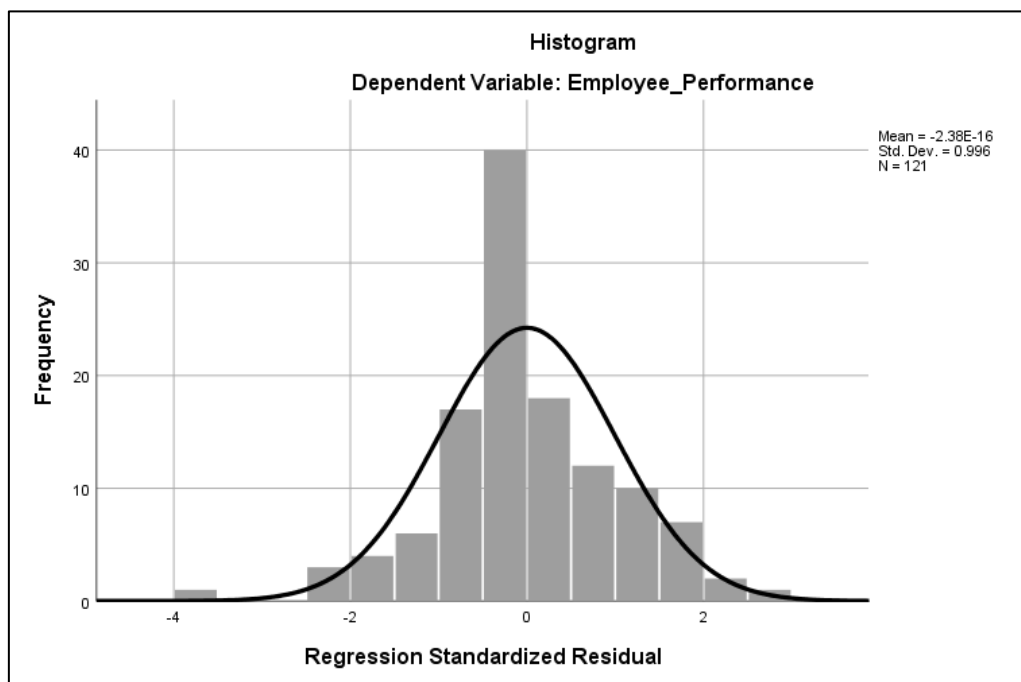
H_0 = There is no relationship of digitalisation on employee performance in the banking sector.

Table 14: Coefficients

Model		Unstandardized Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.616	.825		1.960	.052
	Digitalisation	.768	.054	.794	14.251	.000
a. Dependent Variable: Employee Performance						

Conclusion: The p value is 0.000 which is less than 0.05. Based on the p value, employee performance variable is explained by digitalisation variable (Table 13 and 14). As a result, the equation of the model is:

$$\text{Employee Performance} = 1.616 + 0.768 * \text{Digitalisation}$$

Figure 4: Regression Chart (Histogram)

8.3.3 Hypothesis 2

H_0 = The people above 50 years of age do not find it difficult to cope up with digitalisation.

Table 15: Descriptive

Digitalisation								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
20-29	90	14.6000	5.13591	.54137	13.5243	15.6757	8.00	25.00
30-39	17	14.3529	5.26713	1.27747	11.6448	17.0610	8.00	24.00
40-49	7	14.0000	2.94392	1.11270	11.2773	16.7227	10.00	17.00
50-59	7	13.8571	4.33699	1.63923	9.8461	17.8682	9.00	19.00
Total	121	14.4876	4.96843	.45168	13.5933	15.3819	8.00	25.00

Table 16: ANOVA

Digitalisation					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.892	3	1.964	.078	.972
Within Groups	2956.339	117	25.268		
Total	2962.231	120			

Conclusion: Here, p-value (level of significance) is 0.972 which is more than 0.05, therefore it can be concluded that the people above 50 years of age do not find it difficult to cope up with digitalisation (Table 15 and 16).

8.3.4 Hypothesis 3

H_0 = There is no difference of digitalisation on different levels of management.

Table 17: Descriptive

Digitalisation								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Top Level Management	14	14.2857	5.04485	1.34829	11.3729	17.1985	8.00	24.00
Middle Level Management	58	14.3966	4.59573	.60345	13.1882	15.6049	8.00	25.00
Lower Level Management	24	14.2917	4.97366	1.01524	12.1915	16.3919	8.00	24.00
Staff	25	15.0000	5.95119	1.19024	12.5435	17.4565	8.00	24.00
Total	121	14.4876	4.96843	.45168	13.5933	15.3819	8.00	25.00

Table 18: ANOVA

Digitalisation					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.537	3	2.846	.113	.953
Within Groups	2953.695	117	25.245		
Total	2962.231	120			

Conclusion: Here, p-value (level of significance) is 0.953 which is more than 0.05, therefore it can be concluded that there is no significant difference of digitalisation on different levels of management (Table 17 to 18).

9.0 Results and Discussions

9.1 Findings

The findings of my research are that most of the respondents believe that digitalisation has impacted equally to the employees of different age groups. Also, there is no difference of digitalisation on different levels of management. Respondents also agreed that digitalisation eliminates the repetitive tasks, and it helps employees in the banking sector to deliver the work on-time. Digitalisation has also made it easy for bank employees to maintain and track the record of their customers. Bank employees are now more flexible at work and their workload has been reduced to some extent because of digitalisation. Respondents also agreed that bank ID & different digital applications save time and energy of both customer as well as employees.

Respondents agreed that organisations should highly encourage employees to use the digitalised tools. Digitalisation helps the employees in fulfilling their responsibilities. Respondents also believe that want of handling giant amount of money is going to be reduced due to digitalisation and it will reduce the workload of employees.

Respondents have also given positive response towards improved employee performance due to digitalisation. They believe that digitalisation reduces human error which leads to improved performance. Also, digitalisation has brought high competition in the banking sector which encourages employees to improve their performance and work efficiency. Respondents agreed to the fact that communicating effectively with the colleagues, habit of quick learning, and ready for change in the current digital world helps to improve the performance. Respondents have also supported the fact that planning and organising the work is very important in this digitalised world and it helps in delivering the work on time and improved employee performance. Also, when

employees are committed to their work even in the changing situations and challenges, their performance automatically increases, and this leads to customer satisfaction. Respondents also agreed that employees in the banking sector have to be more careful while doing any transaction in this digital world, otherwise there may happen any cyber-attack which will be a loss for the bank, and it will affect the employee's performance also.

9.2 Suggestions/Recommendations

Arising from the findings of the study and conclusion thereof, it is recommended that banks should give proper training to their employees related to digital technology. Banks must be compelled to create progressive changes in everyday practice to encourage full scale conversion and supply training, facilities, and motivation to machine up the staff to face digitalisation challenges like connectivity issues, difficulty in understanding the servers, and banking software. Motivation is required to encourage and create worker a competent person to figure and productive. It will help banks to face the digitalisation challenges in industry, effectively, and expeditiously.

It is also recommended that banks should highly encourage its employees to use the digitalised tools in the service delivery process to assist them in the best possible way. Since everything is getting digitalised now, so it is recommended to have proper understanding of cyber security and its policies to be secure from banking frauds. In rural areas, less people use smartphones and they have lack of financial literacy. So, employees of banking sector in the rural areas must come up with some new approach to satisfy their customers.

9.3 Limitations

This study is confined to the impact of digitalisation on employee performance in the banking sector only but no other sector. The scope of this study is limited to 9 banks including SBI, Union Bank of India, ICICI Bank, HDFC Bank, Axis Bank, Kotak Mahindra Bank, Indian Overseas Bank, Bank of Baroda, and Allahabad Bank only.

Also, the sample size of data collected by me is limited to 121 only (i.e., $n=121$). This study only talks about employee performance because of digitalisation, but no other HR aspects like organisational development, employee engagement, etc. Also, this study is mainly focused on banking employees not banking customers.

9.4 Further research directions

The same study which is prepared by me can also be done for other banks as well along with or excluding these 9 banks (i.e., SBI, Union Bank of India, ICICI Bank,

HDFC Bank, Axis Bank, Kotak Mahindra Bank, Indian Overseas Bank, Bank of Baroda, and Allahabad Bank). Also, this study of impact of digitalisation on employee performance can also be done for any other sector as well other than banking sector like IT sector, automobile sector, healthcare, etc.

The same research can also be done with data which has larger sample size. The same research can also be done for other HR aspects like organisational development, employee engagement, etc. This research can also be done from banking customer's point of view rather than just banking employee's point of view.

9.5 Conclusions

Digital work strategy is very important and need to be understood because like every other work strategy, digital work strategy supports the organisations to meet business objectives like increasing business performance, reducing prices, and reducing the repetitive task and workload.

This study examined the impact of digitalisation on the performance of employees in the banking industry. The analysis has proven that the digitalisation contains an important impact on employee performance. The performance has been measured in various ways like it eliminates the repetitive task, reduces the workload of employees, reduces the human error, increases the satisfaction, improves the employee's skills, delivers the work on time, and improves the motivation. The study also suggested that employees in the banking sector must be more careful while doing any transaction in this digital world, it will help in doing safe and secure transaction by eliminating the banking frauds.

The study concludes that there is a strong positive correlation between digitalisation and employee performance. This study also suggested that digitalisation has treated employees of all age groups equally and people above 50 years of age do not find it difficult to cope up with digitalisation. Also, digitalisation has equal impact over different levels of management and there is no significant difference of digitalisation on different levels of management.

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- <https://knowledge.fintecsistemas.com/en/blog/the-digitalisation-of-banking>
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The Effect of Nudge Marketing on the Consumer Buying Behaviour of Smartphones in E-Commerce

Devashree Lote*, Vikas Namjoshi** and Binod Sinha***

ABSTRACT

People's decisions are based on the influence that is created by the decision-making environment. Nudging is a concept that belongs to behavioural economics, it describes how even a small change in the decision-making environment influences the decision-making outcome and that small change remains unnoticed by the customers. This concept of nudging was then applied in the digital environment. This study also aims in testing three different nudges like user rating, purchase pressure cue and default on consumer buying behaviour in e-commerce. A survey form was circulated and responses were collected and then a multi-regression analysis was done to check the impact. Nudges like user rating and purchase pressure cue have a significant impact on consumer buying behaviour and the default didn't have any significant impact on consumer buying behaviour. Hence, further research should be done on the default nudge by considering its different factors.

Keywords: Nudge marketing; Digital nudges; User rating; Purchase pressure cue.

1.0 Introduction

The Nudging technique is based on behavioural economics. The nudging technique is not only being used in commercial spaces but also in public policies. Nudging helps the customers to make decisions on the basis of the choices or the surroundings that are being presented to the customers. Nudging was very common in offline stores, but the gradual increase in the use of the internet has made us use this nudging technique in the online environment or in the e-commerce sector.

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Nudging in e-commerce is also called digital nudging. This nudging technique is used to design suitable elements for the users in such a way that it influences the customers buying behaviour. Increasing use of the internet and technologies had given us many choices and alternatives that lead to constant decision-making. Many firms invest a good amount of money to come up with an excellent strategy so as to position their products. From the development of the product to its positioning, nudges can be used to influence customers. There are different types of nudges that influence customer's choices. The three nudges that are considered in this study are user rating, purchase pressure cue and default.

User rating is the review that is used by customers to decide whether to buy the product or not. It is the most important factor in the online mode as the customers can't touch or see the product physically. It also includes the user ratings of the customers, the feedback of the customers, reviews of the customers, etc. It provides a base for the consumers to make better decisions before buying the product.

Purchase pressure cues are used in influencing the customers to complete their process of purchasing by signalling the low availability or even by displaying limited time duration like countdowns, etc. Nowadays, we can see that there are sales and offers frequently held by e-commerce sites. The default option is the one which is preselected and is proceeded if the customer unselects it. Many a time, the default option is used to set the benchmarks by the customers. Default is imposed so as to get the desired option as the outcome. If the default is well designed according to the customers' preference, then it will benefit both the company and the customers as it would be very easy for the customers to make decisions, increasing purchasing and also aiding risk reduction.

2.0 Research Problem

The E-commerce sector is growing at a very rapid pace. It is replacing brick and mortar stores causing a shift in consumer buying behaviour, which leads customers to first know about the brand and compare it with other products before buying. So, every small effort counts when it comes to attracting consumers digitally. Hence, digital nudging will help the brand to influence the decision-making of the customers towards their brand.

3.0 Research Objective

- To examine the impact of user rating on the consumer buying behaviour of smartphones in e-commerce.

- To examine the impact of purchase pressure cues on consumer buying behaviour of smartphones in e-commerce.
- To examine the impact of default on consumer buying behaviour of smartphones in e-commerce.

4.0 Literature Review

Sinha (2018) concluded that the nudge theory can also be used to drive good conduct and can also help in maintaining distance from troublesome ones, it can also help people to take the right decision. Additionally, it can direct people in a proper direction and avoid them breaking the laws.

Weinmann *et al.*, (2016) concluded that customers' decisions are generally based on the decision environment which they are exposed to. It becomes difficult for customers to notice the changes made in the environment. Nudging is a concept of behavioural economics that states relatively that even a small change in the decision environment can lead to a change in the decision outcome, which may be unnoticed by the decision maker. This nudging is being applied in the digital environment, called digital nudging.

Djurica & Figl (2017) stated the relative impact created by the different nudging techniques that affects the choice processes of the customers and also the attitude of the customers towards the sites that uses these nudging techniques. Research is done not only on digital nudging techniques but also on how far they shape the customers' attitudes towards the e-commerce site.

Kroll *et al.* (2019) concluded that this research contributes to the usage of digital nudges and changes in the behaviour of their customers in saving energy. A research was conducted to test the two digital nudges; self-commitment and social norms which were pre-decided. Three experimental groups and one control group were formed. The gap which was seen was that social norms can be more effective if formulated and used in digital nudging. The final result of the study showed that a combination of both the digital nudges led to more saving of energy than using merely any one nudge as energy saving of this group was the highest among all the groups.

Amirpur & Benlian (2015) stated that purchase pressure cues like signal limited time or limited product availability are commonly used features on e-commerce sites to boost up the sales. An experiment, 'Deal-of-the-Day,' was conducted in which it was seen that limited time pressure cue increased deal choice, but the limited product availability cue had no distinct influence on it. Also, it was observed that providing a limited time pressure cue is more effective than not providing it. Purchase pressure cues

should be selected and used wisely so as to stimulate positive reinforcement. The study also states that purchase pressure cues is a cost-effective technique to influence customer buying decision.

Berger *et al.*, (2020) stated that digital nudging helps to represent a promising approach so as to foster desirable consumer behaviour. A study was done in an online grocery store with three digital nudging elements like default rules, simplification, social norms to know the effectiveness regarding consumer behaviour. Also, the digital nudge element default was very effective and promoted ecologically sustainable food products that controlled the typical food consumption behaviour. The simplification also had a positive effect on the consumer's sustainable behaviour who were environmentally conscious. Unexpectedly and contradictorily, there was no influence of digital nudging elements of social norms on sustainable shopping behaviour.

VonBergen *et al.* (2016) concluded that nudges that are empowered with the status-quo bias involve default rules that specify the conditions imposed on the customers when they fail to make a decision. Defaults are considered as nudges as they exert influence on choice without restricting customers' freedom to choose and are often inevitable as many customers just go with the flow and agree to whatever the default may be. As a large number of people are expected to end with it, the default options are handled with care and attention.

Huang *et al.* (2018) stated how effective digital nudging is for the customers with social sharing of online platform content. In the research, it was concluded that nudging messages with the help of monetary incentives, and relational and cognitive capital framings will lead to an increase in the social sharing behaviour of customers, while an only nudging message with simple requests decreases social sharing, compared to the control group without nudging.

Schär & Stanoevska-Slabeva (2019) stated that digital nudging helps users to guide the customers to make decisions on the screens. In multi-channel, multi-owner users' journeys, it is important to guide users through all stages of the customer journey. This research which examines the application of digital nudging throughout customer journey is just emerging and relatively immature. But on the other hand, nudging has proven to be effective in different contexts, such as social security administration, marketing or health concerns, there are few guidelines as to when to implement which nudging effect in a customer journey.

Friis *et al.* (2017) concluded that the priming nudge attempted to prime vegetable choice, but it reduced the consumption of chilli con carne; the default nudge provided a fixed portion of the salad as status-quo or the default bias, which resulted in

an increase in salad intake, but the total energy intake decreased. This paper tried to check if nudging can help to change the people's habits by shifting to the healthier option in a self-service buffet setting.

5.0 Hypothesis

H₁: There is a significant impact of user rating on the consumer buying behaviour of smartphones in e-commerce.

H₂: There is a significant impact of purchase pressure cues on the consumer buying behaviour of smartphones in e-commerce.

H₃: There is a significant impact of default on the consumer buying behaviour of smartphones in e-commerce.

6.0 Research Methodology

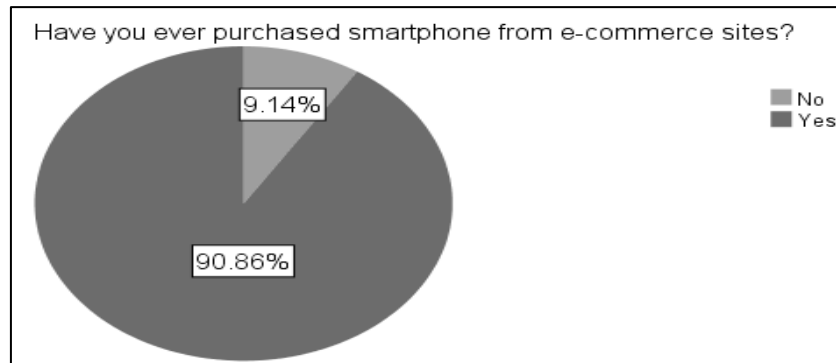
The research methodology adopted for the research is a descriptive type quantitative research design. This method is used to collect the quantifiable data of the respondents' sample for doing the statistical analysis. Also, the convenience type non-probability sampling technique was used. For data collection, due to COVID-19, the survey was conducted online. So, an online survey questionnaire was prepared and was sent to the respondents as the primary survey was done. The respondents of the survey were from pan India locations. For analysing the data and coming to a specific conclusion, the statistical tool SPSS was used.

7.0 Data Analysis and Interpretation

Out of 175 respondents about 90.86% of the respondents who did the survey purchased smartphone from ecommerce sites and remaining 9.14% did not purchased smartphone from ecommerce sites so their responses are not included in further analysis (Figure 1).

The results of the primary survey are provided in Figure 2-10. 38.36% respondents check user ratings before buying the smartphone. 41.51% respondents agree that they buy a smartphone with high user rating. 38.99% agree that they had purchased smartphone during limited time duration. 32.70% respondents disagree that they don't buy a smartphone with user rating 3 or below 3 (lower user rating). 32.70% are neutral that they purchased smartphone when the availability of the smartphone is displayed.

Figure 1: Smartphone Purchased from E-Commerce Site



Source: Primary Survey

Figure 2: Checking the User Rating of the Smartphones before Buying

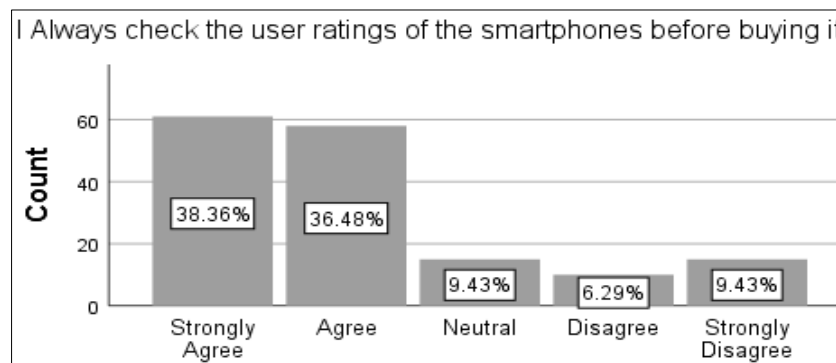


Figure 3: Buying the Smartphone with High User Rating

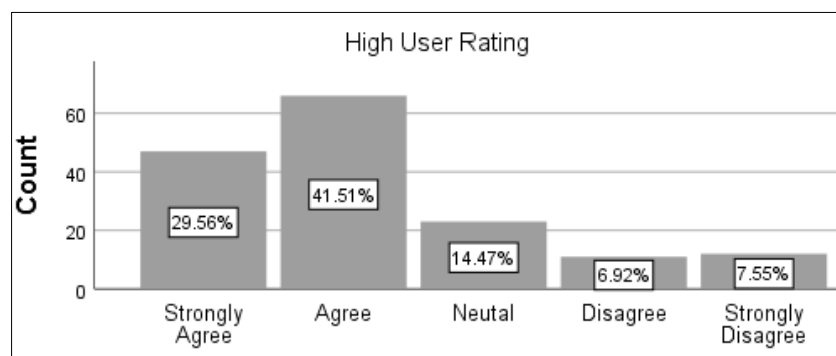


Figure 4: Buying the Smartphone with User Rating 3 or Below 3

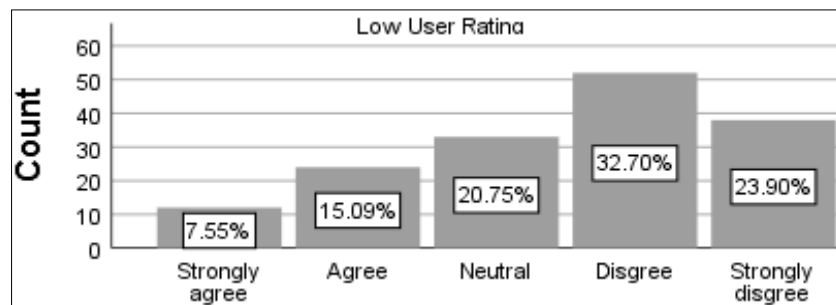


Figure 5: Buying Smartphone during Limited Duration Offers

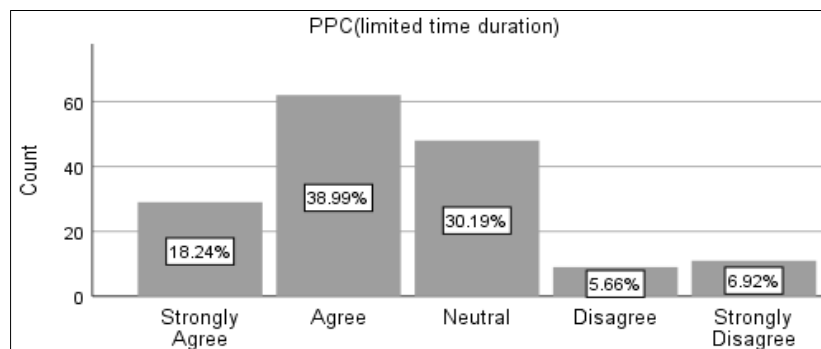
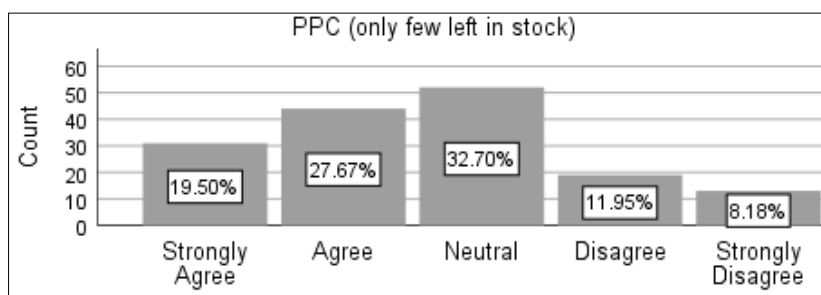


Figure 6: Buying Smartphone When Limited Quantity Left



10.69% people agreed that they purchase smartphones with pre-selected accessories. 21.38% respondents strongly agree that they check for offers/availability before buying of product. 11.95% strongly disagree that they buy insurance that was pre-

selected while buying of a smartphone. 21.38% have noticed that accessories are pre-selected while buying smartphone

Figure 7: Checking Offers/Availability before Buying Smartphone

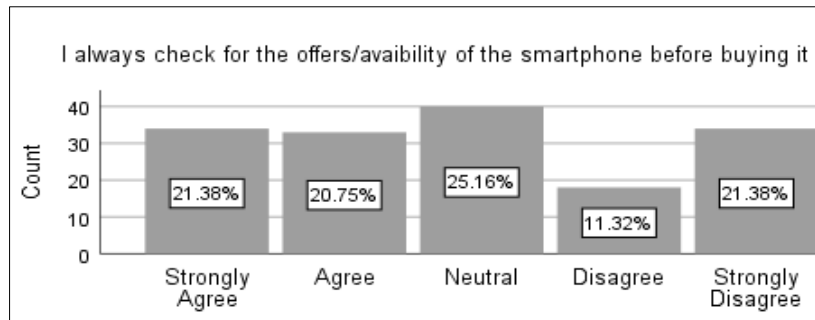


Figure 8: Buying Smartphone with Pre-Selected Accessories

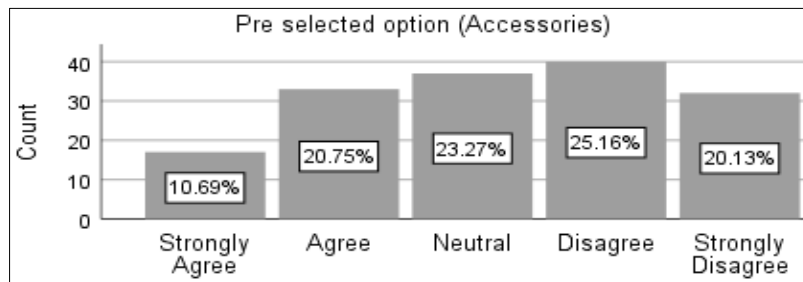


Figure 9: Buying Smartphone with Pre-Selected Phone Insurance

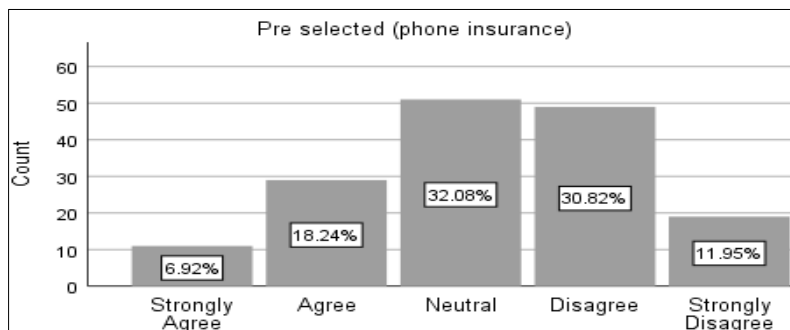
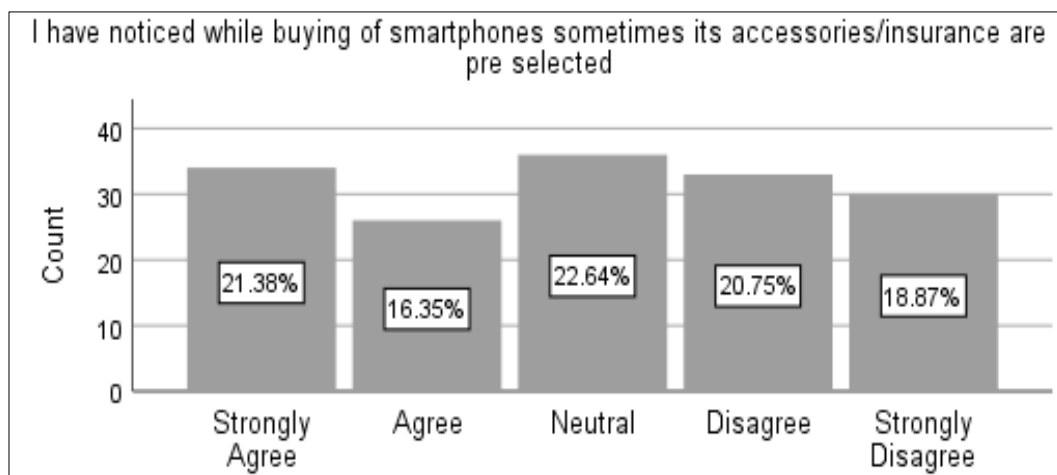


Figure 10: Noticing Pre-Selected Accessories/Insurances before Buying Smartphone

8.0 Hypothesis Testing

H₁: There is a significant impact of user rating on the consumer buying behaviour of smartphones in e-commerce.

Table 1: Model Summary Table for Impact of User Rating

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.514	.265	.255	1.083

Table 2: ANOVA Table for Impact of User Rating

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.813	2	32.906	28.064	.000
	Residual	182.917	156	1.173		
	Total	248.730	158			

Table 3: Coefficient Table for Impact of User Rating

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.542	.312		4.949	.000
	High User Rating	.522	.074	.485	7.063	.000
	Low User Rating	.165	.071	.161	2.339	.021

From the output (Tables 1-3) we can interpret that,

Significant value in ANOVA = 0.000 < 0.05, so, the null hypothesis is rejected.

The hypotheses are true and proved that user rating has a significant impact on consumer buying behaviour.

Hence, it is proved that user rating has a significant impact on the consumer buying behaviour of smartphones in e-commerce.

H₂: There is a significant impact of purchase pressure cues on the consumer buying behaviour of smartphones in e-commerce.

Table 4: Model Summary Table for Impact of Purchase Pressure Cues

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.200 ^a	.040	.028	1.407

Table 5: ANOVA Table for Impact of Purchase Pressure Cues

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.854	2	6.427	3.248	.042
	Residual	308.731	156	1.979		
	Total	321.585	158			

Table 6: Coefficient Table for Impact of Purchase Pressure Cues

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.867	.409		9.462	.000
	PPC(limited time duration)	.249	.106	.187	2.342	.020
	PPC (only few left in stock)	.136	.097	.111	1.394	.165

From the output (Tables 4-6) we can interpret that,

Significant value in ANOVA = $0.042 < 0.05$, so, the null hypothesis is rejected.

The hypotheses are true and prove that there is a significant impact of purchase pressure cues on the consumer buying behaviour of smartphones in e-commerce.

Hence, it is proved that there is a significant impact of purchase pressure cues on the consumer buying behaviour of smartphones in e-commerce.

H3- There is a significant impact of default on the consumer buying behaviour of smartphones in e-commerce.

Table 7: Model Summary Table for Impact of Default

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.148 ^a	.022	.009	1.135

Table 8: ANOVA Table for Impact of Default

ANOVA						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.495	2	2.247	1.746	.178 ^b
	Residual	200.801	156	1.287		
	Total	205.296	158			

Table 9: Coefficients Table for Impact of Default

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.918	.385		10.183	.000
	Pre-selected option	.088	.071	.099	1.235	.219
	Pre-selected phone insurance	.129	.083	.124	1.549	.123

From the output (Tables 7-9) we can interpret that,

Significant value in ANOVA = $0.178 > 0.05$, so, the null hypothesis is accepted.

The hypotheses are false that there is a significant impact of default on the consumer buying behaviour of smartphones in e-commerce.

Hence, it is proved that the default nudge does not have any impact on the consumer buying behaviour of smartphones in e-commerce.

9.0 Findings

The aim of this research study was to find the effect of three nudges (user rating, purchase pressure cue and default) on the consumer buying behaviour of smartphones in e-commerce sites. However, a separate analysis was done for each of the three nudges. The following are the findings of the test conducted on the data collected.

- When the respondents were asked if they had purchased smart phones online, it was observed that the majority (90.86%) of them purchased it online rather than going to the brick-and-mortar stores.
- To test the effect of user rating, a multi-regression analysis was conducted between the impact of user rating and the consumer buying behaviour. It was observed that 38.36% of the respondents prefer checking user ratings before buying the smartphones of their choice and this impacted the buying decisions of the customers.
- It was also seen that 41.52% respondent purchased the smartphone that had higher user ratings (4 or above 4 out of 5) than those smartphones which had lower user ratings (3 or below 3 out of 5).
- It was also found that purchase pressure cues also have a relatively good impact on consumer buying behaviour. Purchase pressure cues like 'limited availability' and 'limited time duration' were considered which created an impact on consumer buying behaviour.
- A majority of the respondents have purchased smartphones when there was a limited time duration offer or limited availability of the product.
- 11.95% strongly disagree that they buy insurance that was pre-selected while buying a smartphone whereas 25.16% disagree that they buy accessories that are pre-selected while buying a smartphone.
- It was observed that default like pre-selected accessories or phone insurance had no impact on respondents buying behaviour.

If nudges are formulated and presented in a better way, they help in increasing the sales and help the customers to take decisions a bit faster.

10.0 Conclusion

This paper helps in understanding the use of nudges like user rating, purchase pressure cue and default in buying of smartphones. A survey questionnaire was made to check different nudges. This study contributes by suggesting nudges like user ratings, purchase pressure cues and default. Also, it showed that user ratings and the purchase pressure cue had a significant impact on consumer buying but default had no impact on consumer buying behaviour. Proper application of these nudges can create a positive impact on sales of smartphones if handled with caution. So, selection of a suitable nudge is very crucial so as to attract the customers whose buying behaviour would be impacted.

11.0 Recommendations

Proper framing of nudges like user rating and purchase pressure cues should be done, that will result in an increase in sales. Purchase pressure cues like limited time duration should be used wisely to attract customers. Also, a combination of two or more nudges can be used so that customers get attracted and end up buying the smartphones. Other nudges like priming, framing, symbols, and anchor pricing can also be explored so as to get more clarity on this topic. Nevertheless, this study was able to show that there is a need for further research to understand how nudges can be implemented along the customer journey.

12.0 Limitations

It was difficult for the respondents to be in the imaginary framed situation and then respond to the questions in the questionnaire. Due to the on-going pandemic, face to face interaction was not possible and hence, a lot of cross questioning and different types of experiments were not conducted. Also, many in-store/online experiments can be conducted to check the impact of nudges on consumer buying so as to get a clear idea about it. Though the default nudge didn't work in this case, future studies can be done on it.

13.0 Future Scope

Customers are now majorly buying smartphones from e-commerce sites. This can be considered as a great opportunity for future researchers or the brands to consider different types of nudges or even a combination of two nudges that will attract the

customer and also increase the sales. This study can also help in contributing to the emerging studies or researchers on nudge marketing and digital nudging.

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- <https://www.veeqo.com/blog/nudge-marketing>

Study on Consumer's Perception Towards Digital Wallets in Pune City, Maharashtra

Vidisha Khaitan*, Ramesh Jadhav** and Binod Sinha***

ABSTRACT

Post demonetisation, the central government in close contact with the RBI & NPCI is making a big push towards online and card-based transactions. The center's vision of becoming one of the 'largest cashless economies' is catching up in cities. With the movement of digital transactions spending rapidly catching up in cities, there has been a growth in people opting for various digital payment platforms or mobile wallets that have made it convenient to conduct e-payment of shopping bills, utility bills, etc. They can effortlessly substitute the physical wallet. One can use these e-payment apps to transfer money or make payments at kirana stores and malls simultaneously. This research, therefore, attempts to investigate the consumer's perception of digital wallets in the Pune city of Maharashtra. A total of 160 respondents were analysed for deriving the conclusion and statistical results. To achieve this objective the paper was divided into 5 interconnected sections.

Keywords: NPCI; Digital wallet; Cashless economy; Card-based transactions

1.0 Introduction

In the world of business, it is very well said that every disruption creates unique and untapped opportunities. One such disruption occurred when the Prime Minister of India, Mr. Narendra Modi announced demonetisation on 8th November, 2016 when he announced that the currency of Rs.500 & Rs.1000 were seized to be legal tender of

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money. This created growth opportunities in the field of the digital wallet/e-wallet industry. The companies grabbed this opportunity to enlarge their existing line of business and expand their market share.

The vision of cashless economy in India has been magnified with the center's initiative under the Digital India campaign. The center has adopted various ways in order to promote a cashless economy. It has put limits on the withdrawal of cash from ATMs and banks. Also, the digital wallet service providers such as Paytm, PhonePe, Google pay, BHIM, Amazon Pay, and Airtel Money are providing various cashback offers and vouchers for attracting clients towards them.

2.0. Concept of Digital Wallets

A digital wallet can be called a substitute for a physical wallet, wherein it is not necessary to have paper currency rather it stores cash in digital form. A digital wallet is a software-based system that stores payment information for making online payments for any transaction. Individual users can link their bank accounts for executing transactions or for adding cash to the digital wallets online. E-wallet serves the purpose of not only making payments but also provide authentication of a user. With the usage of digital wallets tracking receipts and payments has become a cakewalk. It can store complete user information such as transaction history, personal details, and other credentials.

2.1 Theoretical framework: Types of e-wallets/digital wallets in India.

Every mode of cashless fund transfer made by using cards or mobile phones is classified as a 'Prepaid Payment Instrument (PPI)' by the Reserve Bank of India (RBI). These payment instruments can be issued as net- wallets, mobile accounts, smart cards, etc.

Further, it can be classified under four heads:

- Closed wallets: The closed wallets are issued by vendor for facilitating the purchase of goods and services from that particular vendor and do not permit cash withdrawal. Closed wallets cannot be used for settling any third-party transactions; thus the issuance of these instruments is not classified as a payment system that requires any approval/authorisation by the RBI. For example: Amazon cards, Book My Show Wallet, etc.
- Semi-closed wallets: These wallets require RBI's approval. These cards can be used to purchase goods and services, including financial services, remittance facilities, etc. from listed vendors. These wallets do not permit withdrawal of cash or

redemption. For example: One-Circle includes companies like Lifestyle, Max, Spa Market.

- **Open Wallets:** These PPIs allow users to buy goods and services, withdraw cash at ATMs or Points of Sale (PoS) terminals, and transfer funds. These PPIs are jointly launched in association with a bank. It also, allows users to send money to mobile numbers that are linked with banks. For example: debit cards issued by small cooperative banks, etc.

3.0 Review of Literature

Sardar (2016) in his study on, 'Preference towards mobile wallets among the urban population of Jalgaon city' made an attempt to examine the preference of e-wallets among the urban population of Jalgaon city and made an attempt to study the impact of demographic variables on the usage of mobile wallets. The study concluded that less processing time of transaction is an important factor to opt for mobile payments. The use of mobile wallets is still in its early stages, with only 15% of internet users using them, businesses should promote them through their marketing and advertising campaigns. Also, ahead of the complete implementation of the government's Unified Payments Interface (UPI), which envisions frictionless digital money transfers between banks and their consumers, payment businesses (particularly mobile wallets) would need to diversify their revenue streams.

Painuly & Rath (2016) in their paper said that, in recent times, the increasing relevance of technology and mobile has made its impact evident in financial transactions. The concept of 'Mobile Wallet' supports the ability to conduct quick, secure, and intelligent financial transactions. Mobile wallet has aided both the needs of the business owner and the wants of the customer at the same time. In today's world, the intricacy of money transactions drives and encourages the use of mobile wallets. This article intends to investigate the notion of mobile wallet and its expanding importance in a variety of industries on a global scale, spanning from small to major firms, wholesalers to retailers, and even the general public. They accomplished that electronic wallet broke down the ease of exchange, fastened profile and ease in taking care of the wallet cash. They presumed that business affairs like managing an account and transaction records have become easy with the adoption of digital wallet.

Budhathoki (2020) found, that the majority of respondents use e-payment gateways. According to the findings of the data analysis, gender, age, and occupation level have little bearing on youngsters' attitude regarding e-payment, but academic

qualification does. The results of the multiple regression analysis show that trustworthiness and product safety have little effect on teens' attitude on e-payment. However, the model as a whole is statistically significant. According to the Pearson correlation, there is a positive association between trustworthiness and product safety, as well as perceptions of the young on e-payment. Brand managers, marketing managers, and vendor management will all benefit from the conclusions of this study. Male respondents are more likely to use e-payment channels than female respondents. As a result, marketing initiatives and awareness campaigns can be undertaken to increase female respondents' engagement in order to encourage them to utilise e-payment gateways in the future.

Padiya & Bantwa (2018), study showed that e-wallets are rapidly gaining popularity as a mainstream means of payment, and in the not-too-distant future, they will have a major part of the market as a mode of payment for both online and offline transactions. Days are not far away when we shall witness the majority of wallets among Jalgaon city's urban population. In order to comprehend virtual wallets, you must first understand what they are. The primary causes for customer acceptance of mobile wallets were identified in this study. According to Elsevier, the low popularity for e-wallets as a payment method is due to people's unwillingness to shift away from the comfort of using traditional payment methods, privacy issues, and security risks. Users of e-wallets place a high value on features such as security, privacy concerns, and cost (Fees). Long transaction time, security breaches, and delayed payments are the most common issues people face while using e-wallet. The Government of India's demonetisation programme has made a significant contribution to online payment awareness, usage, and acceptability. E-wallets appear to have a bright future.

Kumar & Chaubey (2017), concluded that after demonetisation, digital payments provided respite and forced people to learn digital transactions. People were sluggish to adopt technology, and did not want to pay a premium for digital transactions. People in India, on the other hand, endured money troubles as a result of demonetisation, as they were left with no cash. Furthermore, a platform like Paytm aids them in this regard.

Singh & Rana (2017), in their study learnt about how customers felt about digital payments. Except for education, it was discovered that demographic factors have little impact on digital payment uptake. This conclusion was backed by Anova calculations, which revealed that respondents' perceptions of gender, age, profession, and annual income did not differ significantly. The respondents only saw a difference in significance when it came to their educational level. It appears that the customer's degree of education has an impact on digital payment uptake. If a person has completed secondary school and is computer literate, he or she will be more likely to use the digital

payment method. It was also shown that in areas/regions with a high level of education, such as Delhi NCR and other urban areas, the likelihood of digital payment acceptance is substantially higher. The acceptance of digital payment was aided by the increase in smartphone users and internet access in such areas.

Brahmbhatt (2018), in the paper studied the fact that majority of respondents (92%) agreed to prefer e-wallet over traditional payment shows that e-wallet adoption among Ahmedabad consumers has already progressed beyond the early stages, and success in the e-wallet market now depends heavily on the marketing strategies of e-wallet companies as well as financial policymakers. When compared to other ways of information dissemination, such as advertisements on social media, magazines, television, and government promotion, word-of-mouth exposure has a greater impact. As a result, both businesses and governments should raise awareness by hosting workshops/seminars on cashless society at schools, colleges, and workplaces. The government might make it a requirement for all schools, universities, and institutes to offer at least one programme per academic year. E-wallets are used to recharge mobile phones and DTH receivers. Users favour internet shopping as the second most popular alternative. To improve the growth rate of e-wallets, the authority must make fee payment and submission of IT returns mandatory.

4.0 Objective of Study

- To study the consumer's perception towards digital wallets
- To study the problems faced by consumers while using digital wallets which in turn impact their usage
- To identify the relationship between various demographic factors, like gender, age, occupation, etc. and digital wallets.

5.0 Scope of Study

- The functional scope of the study is to find out the potential reasons for the poor practice of mobile wallet services in India
- Since digital payments are on rise, this research also helps us in finding out the most preferred service provided by the digital wallet service providers.

6.0 Research Hypothesis

H₀₁: There is no significant association between gender of the respondents and the use of digital wallet by them.

H₀₂: There is no significant association between age of the respondents and the use of digital wallet by them.

H₀₃: There is no significant association between occupation of the respondents and the use of digital wallet by them.

H₀₄: There is no significant association between income of the respondents and the use of digital wallet by them.

H_{a1}: There is a significant association between gender of the respondents and the use of digital wallet by them.

H_{a2}: There is a significant association between age of the respondents and the use of digital wallet by them.

H_{a3}: There is a significant association between occupation of the respondents and the use of digital wallet by them.

H_{a4}: There is a significant association between income of the respondents and the use of digital wallet by them.

7.0 Research Methodology

A step-by-step approach used by a researcher to conduct a scientific study is known as research design. In this study, a mix of both exploratory and descriptive research designs has been opted. The current study is based on the data obtained from both primary and secondary sources. The primary data was collected by a structured close-ended questionnaire. The questionnaire measured the variables that the researcher wanted to study and no irrelevant questions were asked. while the secondary data was collected from the journals and websites precisely NPCI (National Payments Cooperation of India).

Sample Size: The primary data was collected from 160 respondents from the different parts of Pune city, Maharashtra. The respondents include youngsters, middle age people, and senior citizens of different professions.

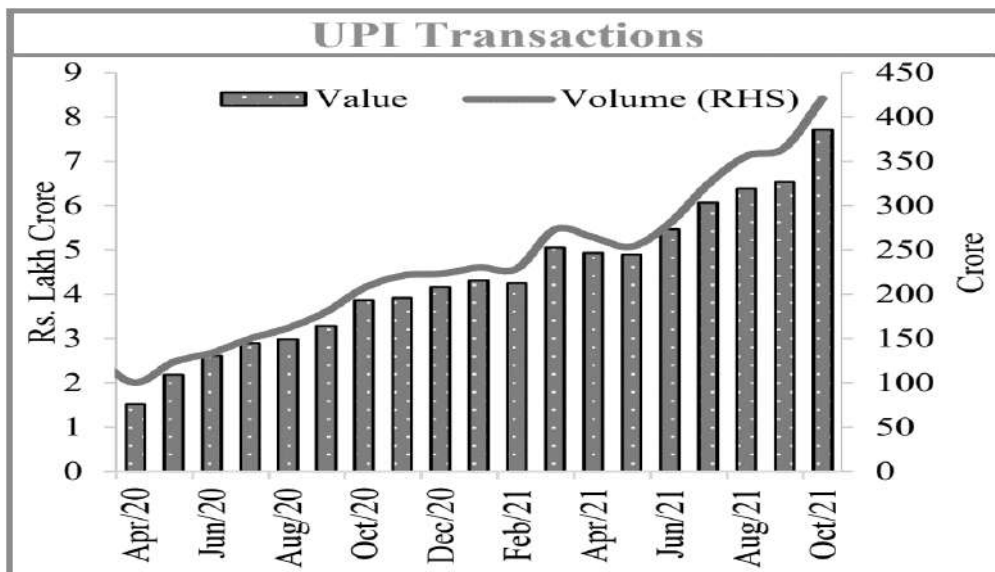
Sampling Technique: During this research, the sample was collected based on the non-probability sampling technique i.e., convenience sampling.

8.0 Market Research

As per Figure 1 it can be seen that UPI transactions are setting a record high after every passing month. It recorded another high in the month of October 2021, where the value of total transactions scaled up to Rs.7.71 lakh crore compared to Rs. 3.9 lakh crore in October 2020. While the transaction volume climbed up to 421 crores, more

than double the volume in October 2020. Also, the digital payment index of RBI rose by 63 points during the past 12 months.

Figure 1: UPI Transaction Data in Terms of Volume and Value Till Month of October 2021



Source: October 2021_0.pdf (dea.gov.in)

Table 1: No. of Banks Live on UPI as at 31st October 2021

Sr. No	Year	No. of Banks live on UPI
1.	2021 (as on October)	261
2.	2020	207
3.	2019	143
4.	2018	129

Source: UPI Product Statistics / NPCI - National Payments Corporation of India

Table 1, states that the number of banks live on UPI significantly increased. In 2018 only 129 banks were live on UPI, which climbed up to 143 banks registered in 2019. Further, it followed a steep inclination from 143 to 207 banks in 2020, and as of October 2021, there are 261 Banks live on UPI. The data furnished above clearly depicts

the growth of digital payment in India. Further, it is speculated that by F.Y 2025 digital transactions will rise up to 58% which stood at 38% in the F.Y of 2020.

9.0 Data Analysis and Interpretation

Descriptive analysis was done under the study. There were various tools used for data analysis, such as SPSS, to perform statistical analysis and Microsoft Excel. The statistical tool adopted in this study is ANOVA and frequency analysis. The statistical analysis was carried out on SPSS 19, where ANOVA was performed to test the hypothesis and frequency analysis was performed for measuring the preferences and perceptions of the users.

Table 2: Respondent's Demographic Profile

Variable	Characteristics	Frequency	Percentage
Gender	Male	82	51.25
	Female	78	48.75
Age Group	18-25 Years	72	45
	25-35 Years	32	20
	35-45 Years	34	21.25
	45 or above	22	13.75
Occupation	Students	68	42.5
	Professionals	24	15
	Businessman	30	18.75
	Homemaker	10	6.25
	Services	26	16.25
	Others	2	1.25
Income	Less than 1 Lakh	104	65
	1 Lakh – 3 Lakh	26	16.25
	3 Lakh – 6 Lakh	8	5
	6 Lakh or Above	22	13.75
User/Non-User of E-Wallet	Yes	144	90
	No	16	10

Source: Primary survey

The demographic profile of respondents is furnished in Table 2. It can be concluded that 51.25% out of the total respondents are male while the rest 48.75% of the respondents are female. Moreover, 45% of the respondents fall under the age bracket of

18-25 years while only 13.75% of respondents fall under the category of 45 years or above. Further, the majority of the respondents were students i.e., 42.5% followed by businessmen, professionals, servicemen, and others. Also, we can conclude that 65% of respondents fall under the income category of less than Rs. 1 Lakh. Ultimately, it can be concluded that 90% of the total respondents are the users of digital wallet while only 10% are the non-users.

Table 3: Frequency Analysis of Consumers Perception

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Digital wallets are the alternatives to cash payment.	72	50	14	4	4
Digital wallets are superior to conventional payments mode.	44	56	32	8	4
Digital wallets can support existing payment methods.	40	74	24	6	0

Source: Primary survey

The frequency analysis of consumer perception in Table 3 replicates the population engaged in the usage of digital wallets. It can be concluded that amongst 144 respondents 122 of them perceived that digital wallet are the alternatives to cash payment. Further 114 respondents out of 144 perceived that digital wallets can support existing payment methods and 100 respondents perceived that digital wallets are superior to conventional payment modes.

Table 4: Frequency Analysis of Problems Faced by Users and Non-Users

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Poor internet connectivity is an obstacle for adopting Digital Wallets	56	80	22	0	2
Lack of technical knowledge is an obstruction for cashless economy	48	80	26	6	0
Delayed reimbursement in case of failed/canceled transaction poses an obstacle in the usage of digital wallets	40	80	30	10	0
Concerned about security issues such as possibility of information theft during wireless transaction at point of sale.	42	76	30	12	0

Source Primary survey

The frequency analysis of problems faced by the users in Table 4 replicates that amongst 160 respondents 136 of them felt that poor internet connectivity is an obstacle for adopting digital wallets. Followed by 128 respondents who felt that lack of technical knowledge is an obstruction for cashless economy. While 120 respondents felt that delayed reimbursement in case of failed/canceled transactions poses an obstacle in the usage of digital wallets and 118 respondents were concerned about security issues such as possibility of information theft during wireless transactions at point of sale.

Table 5: Frequency Analysis of E-Wallet Preferences

	Most Favoured		Favoured		Neutral		Less Favoured		Not Used	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Paytm	36	22.5	50	31.3	44	27.5	14	8.8	16	10.0
PhonePe	40	25.0	56	35.0	46	28.7	10	6.3	8	5.0
BHIM	58	36.3	72	45.0	18	11.3	8	5.0	4	2.5
G-Pay	28	17.5	34	21.3	58	36.3	22	13.8	18	11.3
Airtel Pay	4	2.5	12	7.5	58	36.3	26	16.3	60	37.5
Amazon Pay	22	13.8	30	18.8	46	28.7	24	15.0	38	23.8

Source Primary survey

The frequency analysis of services preferred in Table 5 replicates that BHIM is the most favored amongst the users. Around 130 respondents prefer using BHIM, followed by Phone Pe with 96, followed by Paytm with 86 respondents, followed by Google pay and Amazon Pay while Airtel Pay was the least favored amongst all.

Table 6: Frequency Analysis of Services Preferred

	Most Frequent		Frequent		Neutral		Less Frequent		Not Used	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Phone/DTH Recharge	80	50	62	38.8	8	5.0	2	1.3	8	5.0
Shopping	74	46.3	46	28.7	18	11.3	16	10.0	6	3.8
Bill Payment	66	41.3	54	33.8	24	15.0	6	3.8	10	6.3
Hotel Booking	14	8.8	40	25.0	32	20.0	22	13.8	52	32.5
Insurance Premium	14	8.8	40	25.0	32	20.0	22	13.8	52	32.5
Movie Ticket	40	25.0	52	32.5	34	21.3	24	15.0	10	6.3

Source Primary survey

The frequency analysis of services preferred in Table 6 replicates that the most used services of digital wallet among the respondents are phone/DTH recharge with 142 respondents falling under brackets of (most frequent to frequent) followed by bill payments and shopping with 120 respondents falling under same brackets while insurance premium and hotel booking being the least used services with 54 respondents falling under (less frequent – not used) brackets

Testing of Hypotheses:

H₀₁: There is no significant association between gender of the respondents and the use of digital wallet by them.

H₀₂: There is no significant association between age of the respondents and the use of digital wallet by them.

H₀₃: There is no significant association between occupation of the respondents and the use of digital wallet by them.

H₀₄: There is no significant association between income of the respondents and the use of digital wallet by them.

H_{a1}: There is a significant association between gender of the respondents and the use of digital wallet by them.

H_{a2}: There is a significant association between age of the respondents and the use of digital wallet by them.

H_{a3}: There is a significant association between occupation of the respondents and the use of digital wallet by them.

H_{a4}: There is a significant association between income of the respondents and the use of digital wallet by them.

Table 7: Testing of Hypothesis by Applying Statistical Test-ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
Gender	Between groups	.336	1	.336	1.340	.249
	within groups	39.639	158	.251		
	total	39.975	159			
Age	Between groups	.025	1	.025	.020	.887
	within groups	193.750	158	1.226		
	total	193.775	159			
Occupation	Between groups	.711	1	.711	.451	.503
	within groups	248.889	158	1.575		
	total	249.600	159			
Income	Between groups	4.900	1	4.900	4.001	.047
	within groups	193.500	158	1.225		
	total	198.400	159			

Source: Primary survey

The Table 7 shows the output of ANOVA test that whether we have a statistically significant association between our mean groups or not. As we can observe that, the asymptotic significance i.e., p-value of the demographic variable gender (1.340), age (.020), occupation (.451) and income (4.001) is greater than α value 0.05 which leads to the acceptance of null hypothesis stating that, there is statistically no significant association between the demographic variables (like gender, age, occupation and income) of the respondent and the usage of digital wallet by them.

10.0 Limitations of the Study

- This study was location-specific and was restricted to only the people residing in Pune city, Maharashtra.
- This study was time- bounded and the customer perception may vary in the future with the development of new technology or new user-friendly interface app in the digital payment sector.
- Not all the digital wallet service providers in India were mentioned within the study.

11.0 Findings

It was found that the majority of the users & non-users of digital wallets consider that poor internet connectivity followed by lack of technical knowledge are the biggest obstruction in the adoption of digital wallets. It was found that BHIM is the most favoured digital service provider followed by PhonePe whereas Paytm was not favoured by most of the respondents. It was found that most of the respondents use phone/DTH recharge service most frequently whereas insurance premium service provided by the digital wallets was least used by the respondents.

12.0 Suggestions

Since poor internet connectivity is one of the major reasons posing problems in the use of digital wallets, telecom companies can look into setting up more network towers. Lack of technical knowledge is yet another obstruction for a cashless economy, so more awareness programs and training can be provided to the people, in order to gain their trust and contribute to transparency. Security against a cyber threat is of utmost concern. So, the government and cyber security can play a crucial role, in reducing such threats and rebuilding the trust of users as well as non-users in the digital mode of payments or e-wallets.

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Website links

- [the-indian-payments-handbook-2020-2025.pdf \(pwc.in\)](#)
- <https://m.rbi.org.in/scripts/FAQView.aspx?Id=126>
- [dea.gov.in](#)
- [byjus.com](#)

Social Media's Out-turn on Youth

Satya Kishan*

ABSTRACT

Social networking platforms provide a big forum for debate on current social issues that has previously gone unnoticed in today's environment. Social networking is one of children's and adolescent's most popular pastimes. These sites provide amusement and communication for today's youngsters, and they have become indispensable. Parents and instructors are unfamiliar of the nature of social media platforms, and so are unaware that not everyone present on them is safe for their children. The purpose of this study is to determine the influence of social networking sites on youngsters and the numerous issues that come with it. This is a survey sort analysis, and the data is gathered through tests. The survey is related to youth's preferred type of social media in order to determine their attitudes regarding social networking sites. Negative usage of social media is affecting inter relations; how negatively and positively is the generation affected by the use of these websites; and how will these websites help the youth understand how to utilise them effectively. Users on social media sites such as Facebook and Twitter are also highlighted in the research. The purpose of this research is to examine the developing concerns affecting youngsters as a result of their continual use of social media.

Keywords: Youth; Social media; Facebook; Twitter.

1.0 Introduction

An individual gets an opportunity on these social networking sites to create own profile having the choice to whom they want to connect and thus add in their own list which enables them the usage of features for chatting, video calling, blogging, and

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sharing of videos and photos. These web based services make people spend more time than usual. Thus make them addicted in such a way that the youth finds it very difficult to concentrate on work and prefer surfing on social networking sites. As everything comes with their pros and cons it depends on the individual, how much positivity he can extract. In the same way many people have been benefited where as others are challenged academically. It seems to be difficult for every individual to set their limit for the use of these social networking sites. It is a very common thing that instead of devoting time to work related research in web based services, youth started using social networking sites for the purpose which is not related to work. This paper will try to point out both the pros and cons of online networking which are in demand of our society.

1.1 Commonly used social media websites

1.1.1 Facebook

It is internet's largest social media network, both in terms of overall subscribers and brand awareness. Since its inception on February 4, 2004, Facebook has grown to over 1.59 billion monthly active users, making it one of the finest platforms for connecting people from all over the world with your company (Siddiqui & Singh, 2016). More than 1 million small and medium-sized enterprises utilise the site to market their business, which is understandable.

Twitter

We may believe that limiting our posts to 140 characters is no way to promote our business, but we will be surprised to learn that this social media platform has over 320 million monthly active users who can make use of the 140 character limit to communicate information (Siddiqui & Singh, 2016). Businesses may use Twitter to communicate with potential customers, answer inquiries, and provide the latest news while also targeting advertisements to specific audiences. Twitter was started on March 21, 2006, in San Francisco, California, and is headquartered there.

1.1.2 Google+

Google+ is amongst the most widely used social networking platforms nowadays. It is a must-have tool for any small business because of its SEO worth. Google+ was launched on December 15, 2011, and as of December 2015, it has 418 million active users.

1.1.3 YouTube

YouTube, the world's largest and best-known video-based online networking platform, was founded on February 14, 2005, by three former PayPal employees. Google later bought it for \$1.65 billion in November 2006. YouTube has over 1 billion monthly visitors and is the second most popular internet search engine behind Google.

1.1.4 Pinterest

Pinterest is a relatively newcomer to the world of internet networking. This level includes electronic announcement sheets on which businesses can paste their content. Pinterest announced in September 2015 that it has reached a milestone of 100 million users (Siddiqui & Singh, 2016). Private businesses whose target market is mostly female should invest in Pinterest, as the majority of its visitors are female.

1.1.5 Instagram

Instagram is a social media internet networking platform. Facebook owns the site, which has more than 400 million active users. A large number of its customers use it to share information on travel, fashion, food, craftsmanship, and other related topics. The stage is also known for its incredible channels, as well as video and image changing features. Approximately 95% of Instagram users also have a Facebook account.

1.1.6 WhatsApp

WhatsApp messenger is a mobile, desktop, and tablet instant messaging application. To transmit photographs, texts, documents, audio, and video messages to other users who have the programme installed on their devices, this application requires an internet connection. WhatsApp Inc. was founded in January 2010 and bought by Facebook for \$19.3 billion on February 19, 2004. Over 1 billion people utilise the service to communicate with their friends, family, and even clients.

1.2 Feature of social media websites

There are several advantages to social networking but it also has a lot of disadvantages. Instagram, Facebook, Twitter, LinkedIn, and Pinterest are just a few of the social networking platforms accessible. Table 1 lists some of the beneficial characteristics of social media, whereas Table 2 lists the bad aspects (Bhardwaj *et al.*, 2017).

Table 1: Positive Characteristics of Social Media

Advantages of education	Students and mentors collaborate on assignments and projects using social media. Students may get innovative ideas and strategies for their work through social media sites like Pinterest. Students and mentors use social media as an instructional resource, such as YouTube.
Politics	The use of social media has improved voting turnout. The majority of youngsters voted after viewing their friends' posts on Facebook. Online sites facilitate social movements in a timely and cost-effective manner.
Opportunities for employment	It's an excellent platform for marketing purposes. Thousands of online employment and income opportunities have arisen as a result of social media networks. According to search, 89 percent of young people have been recruited using LinkedIn, 26% via Facebook, and 15% via Twitter.
Awareness	The majority of young people acquire their news through social media. Information has been shown to spread quicker on social media than on any other medium. People may use social media to enlighten and empower themselves and their communities.
Social advantages	68 percent of students think social media sites have aided them during difficult times. 57 percent of teenagers feel that social media may help them make new friends.

Table 2: Negative Characteristics Of Social Media

Privacy issues	Most teenagers post personal information on social media without even reading the privacy policies. Many insurance firms use information from people's profiles to target advertisements to them. According to Google, most cyber-crimes start with social media hacking of personal information.
Users at risk of criminal activity	Sexual predators use social media to track down, stalk, and abuse their victims. Many cyber-attacks, such as hacking and identity theft, use social media as a platform. Unauthorised sharing and copyright infringement endangers property and results in financial loss.
Social consequences	Due to the lack of face-to-face interaction, many youngsters suffer from sadness. People who spend more time online are more likely to develop neurological diseases and have poor social skills.
Time waster	Returning to the original task takes roughly half an hour when there is a new tweet or social media post. Approximately 20% of teenagers spend more time on social media than with their parents.
Misinformation	Rumors and fraudulent communications have been seen to spread quicker on social media than any other medium. Seeking medical advice or self-diagnosis can be risky and even fatal.
Workplace disadvantage	Students can cheat on schoolwork while they are social. Employee productivity is impacted as a result of social media. According to the research, students who use social media while studying receive a 20% worse mark than typical.

2.0 Literature Review

Adolescents and youth utilise social media extensively. Since its inception in 2003, Facebook has experienced a significant surge in users who utilise it for a variety of objectives. It allows individuals to show off their secret talents to the rest of the world. Facebook, Instagram, Twitter, YouTube, Snapchat, and Tumbler all provide people with extensive opportunities to study and choose based on their interests. It benefits all of its users in the most desirable method, from being paid to operating enterprises, from enjoying spectacular material to exhibiting inner abilities, from reading books and novels, and engaging content to remain up to speed with current events. While social media has a wide-ranging and far-reaching influence on kids, it is also being misused. It has certain negative consequences, ranging from cyber bullying to internet crimes, hacking to data leaks, etc. (Akram & Kumar, 2017).

Young students utilise social media during their studies in recent times. It permits people to comprehend many types of information from various sources. It is used by students to expand their knowledge and uncover hidden mysteries. Students may also improve their talents and demonstrate their potential by submitting appealing content on various blogging platforms, proving their value. Social media is not just entertaining; it also allows young people to build collaborative relationships with others, allowing them to expand their potential. It also allows people to effortlessly exchange things such as books, articles, and educational films (Siddiqui & Singh, 2016).

On the other hand, social media has a harmful impact on young people. According to research conducted by Ohio State University, students who utilised social media during their study hours had lower scores than those who did not. Furthermore, excessive and imbalanced usage of social networking sites causes mental and psychological stress, which inhibits their ability to study and comprehend. To be more specific, there have been cases where young people have become entangled in internet criminal activity due to a lack of understanding and information. Those who engage in behaviours that mankind considers being evil pose a serious threat not only to the person they are tormenting, but also to themselves. (S, Kumar, & Kumar, 2019,)

Parents must also keep a close check on their children's activities. Because social media gives its users freedom, there are concerns that they will engage in unethical or illegal behaviour. This requires good direction and instruction, which should begin at home. The goal of positivity can only be attained if children comprehend what is good and what is harmful (Fernandez, 2011).

Among the children are those who are homeless, poor, or living in dangerous situations. For them, social media is a blessing in disguise, as it allows them to shape

their careers in a favourable setting in a variety of ways. They are the ones who are subjected to the most heinous forms of torture, harassment, and violence. Social media gives them a forum to voice their concerns, mould their personalities, and prepare for a prosperous future (Rice & Barman, 2013).

The rise of internet platforms has also given young people more independence. They are allowed to share their opinions on pending processes and to criticise the government's harsh practises. As a result, it promotes and preserves democratic ideals while also assisting in the formation of a system based on mutual understanding. It also maintains some checks and balances on these liberties, preventing citizens from engaging in any unlawful discussion or activity that is contrary to the state's sovereignty (Zeitel-Bank, 2014).

Unavailability of genuineness, difficulty of varied thoughts, growth in nudity, and threat to moral conducts are some of the shady bargains of social media. If not adequately monitored, social media may be detrimental to the smooth operation of the socio-economic system. Immoral and objectionable information can cause mental tension, which can influence a wide range of human activities. Another harmful consequence of this media is cybercrime (Shabir, Mahmood, & Safdar, 2014)

Because the media connects individuals from all over the world, they exchange good and cherished traditions and choose to incorporate them into their everyday lives. Young people in the eastern part of the country tend to dress and speak in western manner. If you look at the linguistics, you'll see that young people from Asia strive to imitate the British or American ways of speaking. All of this occurs as a result of social media. Young people pay attention to western influencers and try to put what they learn into practise. The same may be said for attire and other aspects of life (Sawyer & Chen, 2012).

The growth in tourism activities throughout the world is one of the benefits of this global integrator. Brands and tourism management organisations have benefitted from social media by showcasing their stunning sights to the public and attracting their attention. This increases visitor activity and generates income, which helps to establish a robust economy. Tourist activities contribute significantly to the GDP of several nations, such as Singapore. Travellers who have visited these great locations share their photos with their loved ones and encourage others to visit (Zeng, 2014).

The agreement, on the other hand, promotes firms to provide tourists the greatest possible view of their items. People go to online markets and sellers in current times, and companies find this to be an enticing way to offer their goods. To draw people's attention to a certain brand, Facebook, Twitter, and YouTube may all be used (Leung, 2013).

E-commerce has also benefited from the growing importance of social media. Advertisements on social media networks help online marketplaces like Amazon, Alibaba, etc. gain more traffic. It also enhances the online transaction system and provides a reliable framework for efficient corporate management. Some websites, such as Facebook, are focused on their own money for transactions conducted through them (Linda, 2010).

Teen and juvenile health is one of the primary challenges in modern times, and widespread usage of social media sites exacerbates the problem. Adolescents suffering from mental stress are increasingly finding themselves alone and disappearing. Excessive usage also causes psychological stress and disconnects the user from the outside world, preventing him from learning and acquiring new skills (Richards, 2015).

3.0 Objectives

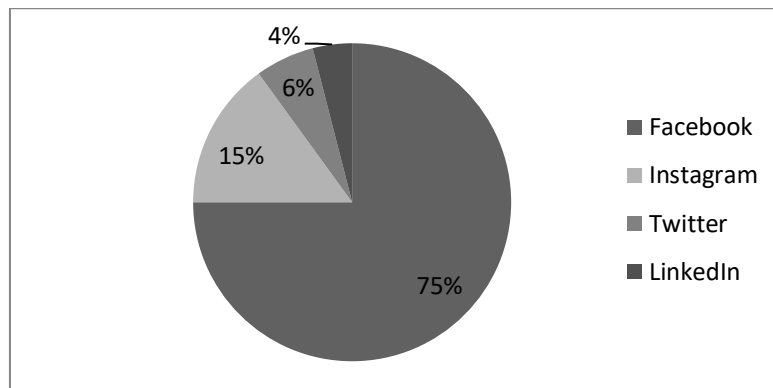
- To find out total usage of particular social networking site by youth.
- To examine social networking sites information credibility.
- To observe the pros and cons of various social networking sites used by youth.
- To study up to what extent there is influence of various social networking sites on youth in professional and personal life .

4.0 Hypothesis

- Social networking sites affects the youth's information credibility
- Youth have more inclination towards entertainment field in comparison to other fields.
- Social networking sites influence the youth professional and personal life.

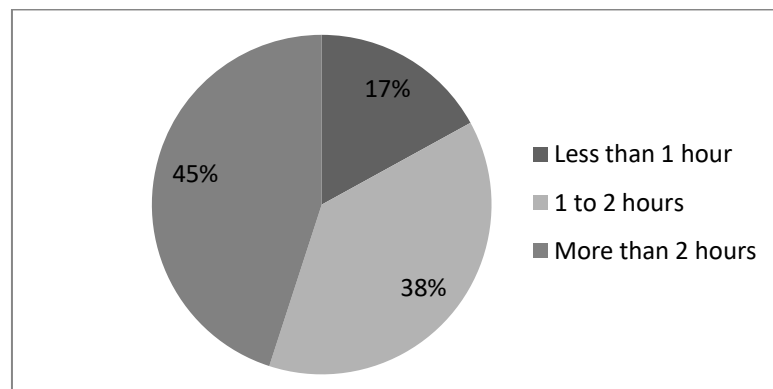
5.0 Research Methodology

Quantitative approach is used in this paper for studying research objectives. Well prepared structured questionnaire was the main tool which was used for the data collection. The question's nature was close ended and pie charts were used as tool. Targeting the age bracket of 15-24 a survey was conducted. Respondents have filled in all 100 questionnaires total of 10 question were asked to them which are based on the objectives and hypothesis. Around 75% of the youth told that they use Facebook, when they were asked which social networking sites they uses the most. For the same question percentage of youth using Instragram, Twitter, LinkedIn were 15%, 6%, and 4% respectively (Figure 1).

Figure 1: Which Social Networking Sites Youth Uses the Most?

Source: Primary survey

In another question about time spend while accessing various social networking sites in a day, maximum respondents around 45% told that they spend two hours while 38% told 1-2 hours and 17% give less than 1 hour. It shows that maximum no of youth uses social networking sites for more than two hours in a day (Figure 2).

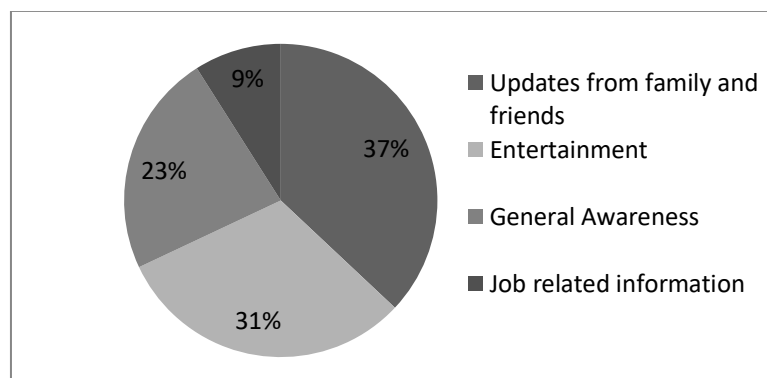
Figure 2: How Much Time Youth Spend While Accesing Various Social Networking Site?

Source: Primary survey

To find out nature of information the youth get from these kinds of social networking sites. Around 37% told that to get updates from their family and friends. Another 31% find this site an entertainment source while about 23% uses this site for

general awareness and around 9% uses them for job related news. This clearly shows that youth uses these social networking sites for awareness and information also but due to this they lose their focus towards goals, since very less youth gathers job and general awareness information (Figure 3).

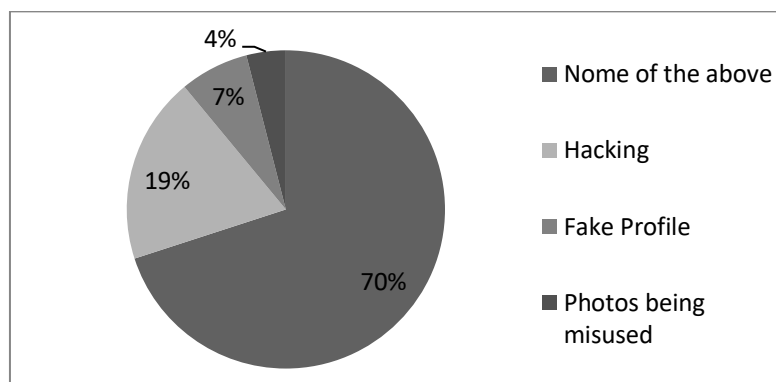
Figure 3: Nature Of Information Youth Derives from Various Scoial Networking Sites



Source: Primary survey

When the youth were asked about cyber crimes through these social networking sites around 70% told that these social networking sites due to their privacy and account setting seems to be immune from cyber crime .On the other 19% told that they were victim of hacking, 7% were victim of fake profiles, 4% were attacked with fake profile, thus indicating that still lot of youth becomes victim of cyber crime (Figure 4).

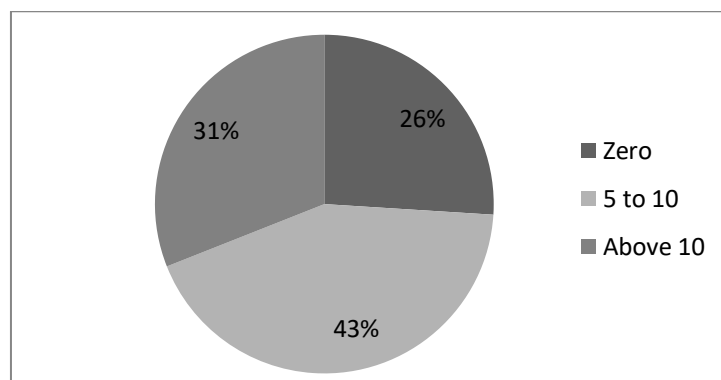
Figure 4: Whether Youth Have Become Victim of Cyber Crime



Source: Primary survey

When the youth were asked whether they add unknown people or stranger in their social networking site profile around 43% told that they have added 5-10, whereas 31 % answered 10 and above. But still 26% were there who have not added any unknown profile in view of privacy and secrecy (Figure 5).

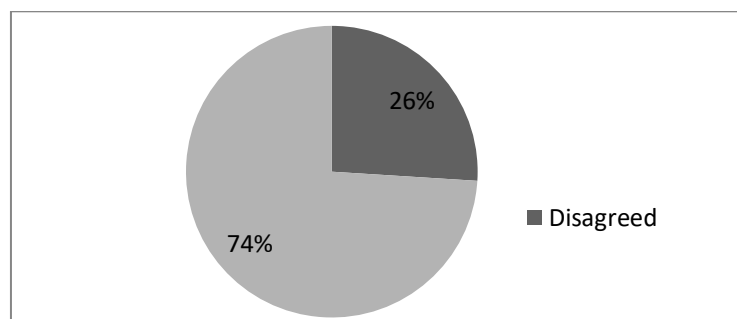
Figure 5: Whether Unknown People are Added in Their Profile by Youth



Source: Primary survey

When it was asked that whether social networking sites helps in building personal and professional relationship, around 74% agreed and 26% disagreed. This is a known fact that these sites not only connect people of various zones in their personal front but also the professional one. These sites are beneficial to every individual in their own way (Figure 6).

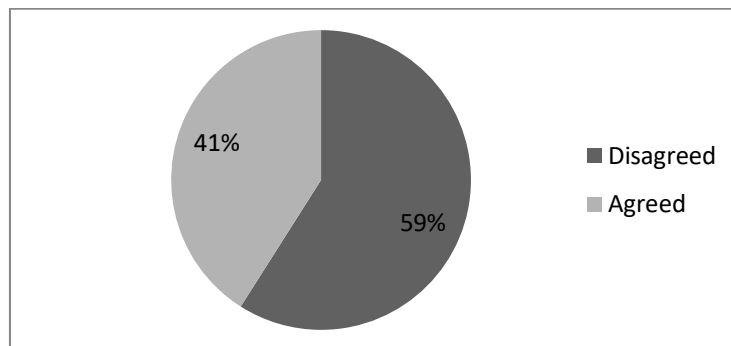
Figure 6: How Many of You Agree that Social Networking Sites Helps in Building Personal and Professional Relationship ?



Source: Primary survey

When it was examined whether social networking sites help in making stronger context, around 59% of the youth disagreed whereas 41% agreed to have stronger context. As there is a very thin line of opinion difference we can state that majority of the youth still feels that real world exists than the virtual. The influence of these sites is not to the extent where youth feels comfortable in making stronger context through social media (Figure 7).

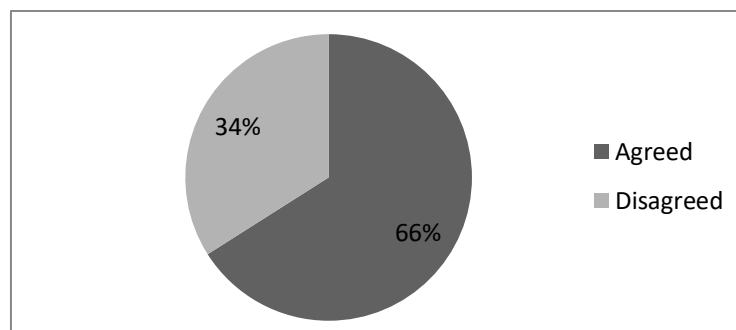
Figure 7: Whether Social Networking Sites Help in Making Stronger Context



Source: Primary survey

We have already analysed from collected data that large no of youth spends on an average two hours per day on various social networking sites which justifies that they neglect social gatherings and give preference to being at home and assessing social networking sites, As per our survey around 66% of youth is like this whereas other 34% admitted that these social networking sites are not any reason for hampering their social gatherings (Figure 8).

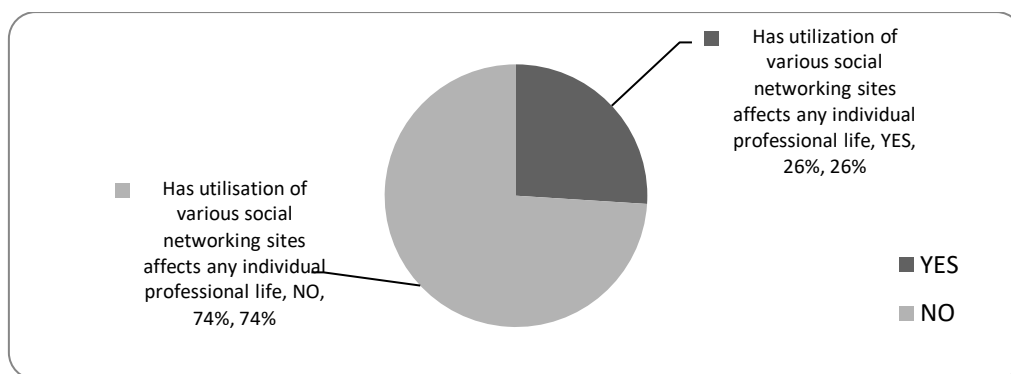
Figure 8: Does Social Networking Sites Hamper Social Gatherings?



Source: Primary survey

Around 74 % of youth which were targeted told that their professional work is not affected due to use of various social networking sites .It highlights the fact that how people have evolved to prioritise various task assigned. But this also shows that these social networking sites are gaining momentum in popularity and usage (Figure 9).

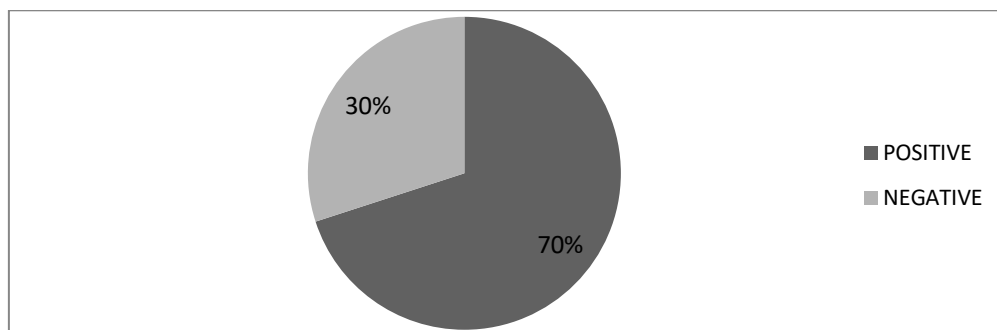
Figure 9: Has Utilization of Various Social Networking Sites Affects Any Individual Professional Life?



Source: Primary survey

When the question was asked about positive and also negative aspects of various social networking sites on individual's life, around 70% chose positive over negative. People are slowly understanding and getting used to proper usage of various social networking sites which results in positive aspects weighing heavier as compared to negative aspects (Figure 10).

Figure 10: Social Networking Sites Have More Positive or Negative Aspects



Source: Primary survey

6.0 Conclusion

With a primary objective of effectiveness of various social networking sites on an individual and evaluating various parameters like positive aspects and negative aspects, the study clearly exhibits about youth smartness, intelligence and better understanding of handling social media. Few conclusions have been drawn as per data collected based on the questionnaire being asked to them. Today's youth is aware of what is best for them and at same time also ready and positive to find out their own priorities. Through various social media sites a platform is being provided for connecting people globally without disturbing their working hours and without affecting their schedules. These sites help them in connecting and sharing their experiences with various people globally and which eventually helps in gaining exposure. It further facilitates youth to clearly identify difference between real world and virtual world and make them realise that through social networking sites building stronger contacts with people is lacking. Faith and trust are more between contacts made through real world as compared to virtual world due to vulnerability of various cybercrimes in virtual world.

As there are always two sides of coin, social networking sites side effects are also no exception. On an average, youth spends more than 2 hours on various social networking sites which prevents them for socialising and interacting with others. These sites are mainly used for entertainment and virtual socialising with friends and family rather than job related work. This study reveals that there are both positive and negative aspects and impacts in an individual's life. Today's youth being techno savvy and mature to know how to draw their boundaries and is also able to identify their limits.

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Big Data & Analytics for Service Operations: Innovations and Challenges

Vikram Hande* and Vivek Marathe**

ABSTRACT

This study examined the usage of big data & analytics for innovations in service operations. In a current industrial economy, service companies hold major share of India's Gross Domestic Product (GDP) and employment. Management of service operations is essential for the economic growth of a country. India's service sector includes trade, hotel, transport, storage, information technology, communication, financing, real estate, insurance, business service, personal, social services and other variety of activities. The service operations managers have to provide decision making in the context of variety of services. In service industries data is generated by devices, service blue prints, service life cycles. Researcher has designed how big data and analytics can be used with service blue print for new innovations to improve the service quality. This paper outlines the value of big data offers for service operations, innovations and challenges.

Keywords: Big data; Analytics; Service blue prints; Service operations; Innovations

1.0 Introduction

The productivity of services has recently become an intensively researched topic (Biege *et al.*, 2013). Innovation is regarded as new creations of economic significance (Manley, 2007). The focus on new service development and adding value with current services has forced companies to rethink on their strategies. Companies have to move towards collaborations with exchange of data. The use of big data and

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analytics can offer value for companies in each area such as new service developments, service quality, facility location, service inventory, blue prints, managing capacity and demand (Akhtar *et al.*, 2016). Big data analytics is now viewed as a disruptive technology that will significantly transform business intelligence and analytics (Olszak & Zurada, 2019).

In this paper researcher explored the role of big data and analytics in the global services operations. First authors explain big data, analytics and service blue print with previous literature.

Second phase shares information on challenges of 5V's of big data in service blue print. Then provided digital transformation innovations for service blue print to improve efficiency and competitiveness in service operations. This research will be helpful for industry and academia to understand service blue print, big data, analytics and digital transformations of service blue prints to develop new services or improve efficiency in existing services.

2.0 Big Data Analytics

Big data refers to datasets which are large in size and difficult for processing by using traditional tool and techniques (Constantiou & Kallinikos, 2015). Big data technologies have a positive impact in various industrial areas such as: it helps to improve supply chains; increasing sales and managing customer loyalty in marketing. It reduces costs in services by using real-time data. Minimises risks in financial and healthcare sectors. Big data has heterogeneous datasets in the digitised, networked and sensor loaded information. Big data can be described with 5 V's such as volume, velocity, variety, veracity, and value (George *et al.*, 2016).

In today's digital era almost all types of services have a digital presence and are data oriented. Service firms interact with their customers through several channels. The challenge then is to transform the data into strategic levers that help the firm to improve the current customer experience and quality of service. Data-driven decisions are better decisions. Using big data enables managers to decide on the basis of evidence rather than intuition.

Big data and analytics bring a new source of competitive advantages for service sector to carry out service operations so as to obtain visibility and capability to adjust under demand and supply fluctuations. It provides insights into customer behaviours and patterns so that companies can take decisions on pricing and quality services. Companies seek to use their data to identify trends, detect patterns, and to know their customers' habits and preferences better.

3.0 Service Innovations & Service Blue Print

Service innovation is referred as the new invention that is taking place in the various contexts of services (Robert & Nambisan, 2015). It includes the introduction of new services or incremental improvements in the existing services. It is basically different from product innovation due to lack of tangible nature.

Services may be highly custom-made according to the client/customer needs, and include many different stakeholders. Hertog (2000) has presented the “four-dimensional model of service innovation”, it captures the idea of service innovation in a knowledge-based economy (De Brentani, 2001). The model consists of the following dimensions:

- Service concept: A new service in the market
- Client interface: A new way as to which clients are involved in the service production
- Service delivery system: A new way in which the actual services are delivered to the customers
- Technology: Make sure that the services can be provided efficiently with technology

4.0 Service Blue Print

A service blueprint is a strategic tool that helps service provider’s team to understand how the customer experiences a service. It is a diagram that visualises relationships between people, processes, physical and digital touchpoints created to a specific customer journey.

Service blueprint was initially introduced in 1984 by G. Lynn Shostack in the Harvard Business Review. Service blueprint diagrams visually map out the steps in a service process, making it easier to design a new process or to document and improve an existing one (Bitner *et al.*, 2007). It is a process control technique for services that offers several advantages:

- More precise than verbal definitions
- Helps to solve problems early
- Assists to identify failure points in a service operation

5.0 Service Blue Print Elements

Physical Evidence: It is proof that the interaction actually happened with customer and service provider.

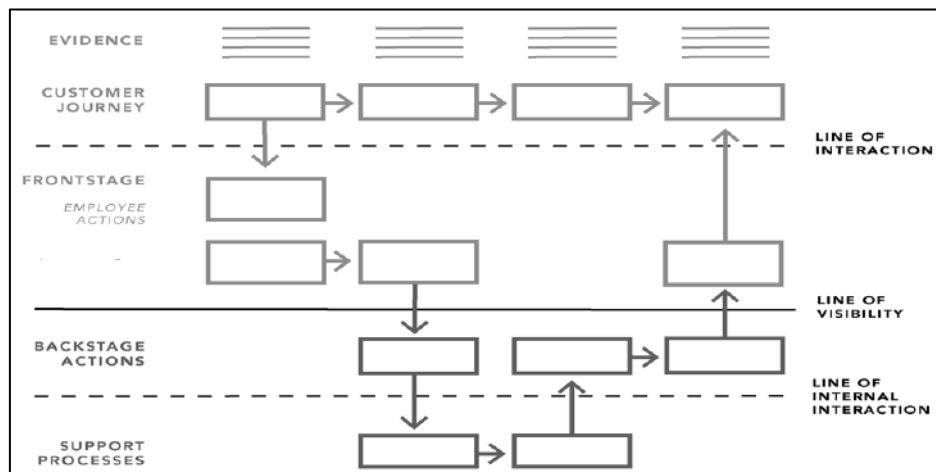
Customer Actions: It is provided by the service provider to map customer journey and extract information on steps, choices, activities, and interactions a customer may go through to meet their goals.

Onstage Actions: These actions happen in front of the customer. They are either human to human or human to machine.

Backstage Actions: These actions are not visible to customer

Support Processes: These are steps and interactions that support onstage employees to deliver a service to their customers.

Figure 1: Service Blue Print Diagram



Source: mngroup.com

Service blue prints have three key lines (Figure 1):

- **Line of interaction:** Direct interaction between customer and the organisation
- **Line of visibility:** It separates service visibility above the line and backstage is below the line.
- **Line of internal interaction:** It separates employees who have direct customer contact and who don't have direct customer contact.

6.0 Big Data in Service Operations

Service firms are attentive on the collection and storage of enormous data to improve service efficiency. However, they are facing challenges to make complete use of such data. The challenges are summarised in Table 1.

Table 1: Big Data Challenges in Service Operations Blue Print

Aspects	Big Data	Service Operations Blue Print
Volume	Refers to the huge amount of data generated in services	Large data generated in service processes
Velocity	High speed of accumulation of data	Data flows from mobiles, social media, e-commerce platforms
Variety	It refers to nature of data, structured, unstructured and semi-structured	Diverse sources and various sensors used in services
Veracity	Inconsistency and uncertainty in data. Degree of accuracy/truthfulness	Sources of data veracity includes human error and data sources in services
Value	Data must be converted into useful information	Improving operational efficiency with insights, reports, analytics and statistics

Service companies are working on application of big data to get competitive advantage. Table 1 provides assistance to the managers for understanding where they could begin to incorporate big data and analytics across their service operations.

The use of simulation with statistics and visualisation techniques allows analysing customer needs on real time. It supports for developing strategic, tactical and operational decision-making for service operations (Chae *et al.*, 2014). Service companies have to initiate total quality management, just in time and statistical processes to monitor quality of data in services.

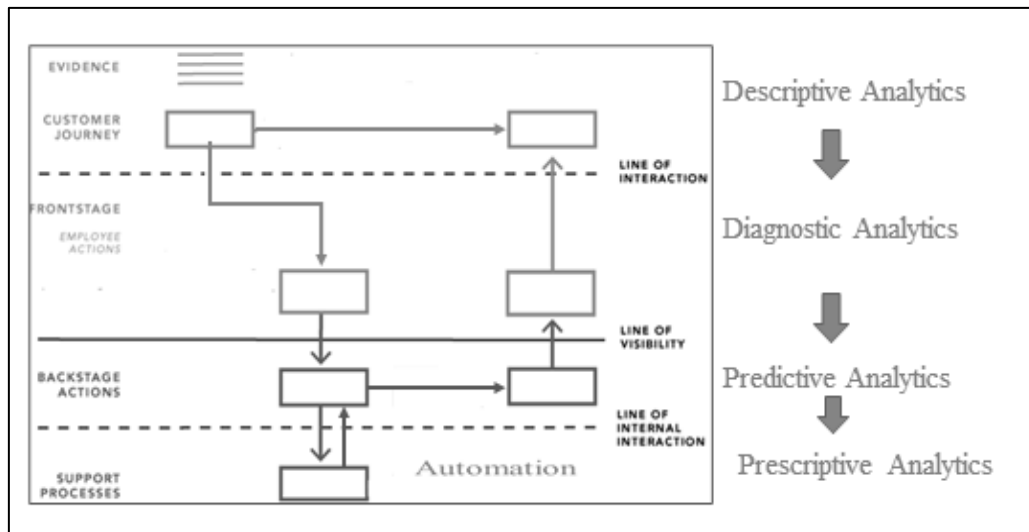
7.0 Innovations-Digital Transformation in Services Through Blue Print

Digital transformation through blue print will address the current customer issues and develop new services. It will address the need of consumer preferences, technology and competition. Example of Uber which has completely dominated the transportation sector, forcing other taxi service providers to discover ways to incorporate similar online app-based ride experience, ride-sharing, car on rent or other on-demand services into their business.

Digital transformation is setting new standards for service business growth. It is not just about incorporating newer technologies into business but it is a digital disruption, which requires restructuring everything in the business process and digital leadership (Lee *et al.*, 2017). The numbers of connected devices from smartphones to cars to industrial automation to smart cities and its connection to humans is increasing. Organisations that deliver digitally transformed services will gain a competitive

advantage. Digital transformation is about rethinking the services and processes, digitalising systems, and delivering highly connected and contextual experiences for the end consumers. Major focus of service companies will be to provide better digital customer experience. Emerging technologies such as internet of things, machine learning, artificial intelligence, virtual reality, augmented reality, big data and cloud computing are changing the way services will operate in future (Figure 2).

Figure 2: Digital Transformation in Services



Source: Author's Model

Digital transformation strategy should clearly define about the business process change, cultural change, and technology change for service innovations (Kane *et al.*, 2015). Data is a critical element for business decisions. Perform analytics on customer data, operational data and performance data to take decisions for the future.

8.0 Case: A Service Company has Provided Data for Service Problems

Service quality is priority of companies and a company measures the defects in services to improve customer experience. Managers can use big data and analytics to find the problems in existing services and with analytical tools they can get insights for service improvements. Digital dashboards can be created to take decisions and improve customer experience (Table 2).

Table 2 : Data for Service Problems

Service Quality- Problem	Count
Evidence	40
Customer waiting	330
Employee mistakes in services	270
Backstage Actions	30
Support Processes	40

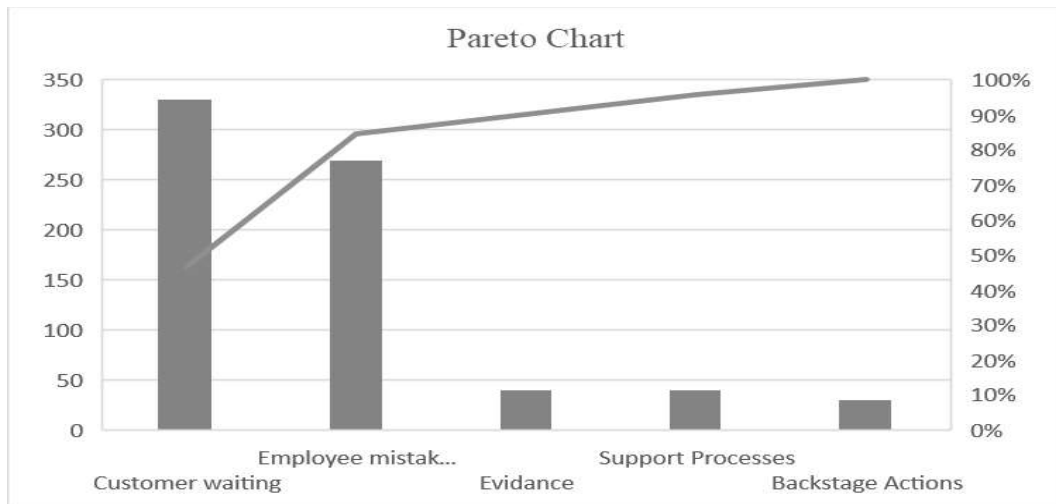
Source: Vimo Foods Pvt. Ltd.

Customer service dashboard provides insights that are necessary to improve the customer experience and type of support service the provider can offer with people, process and technologies (Figure 3).

Figure 3: Customer Service Dashboard

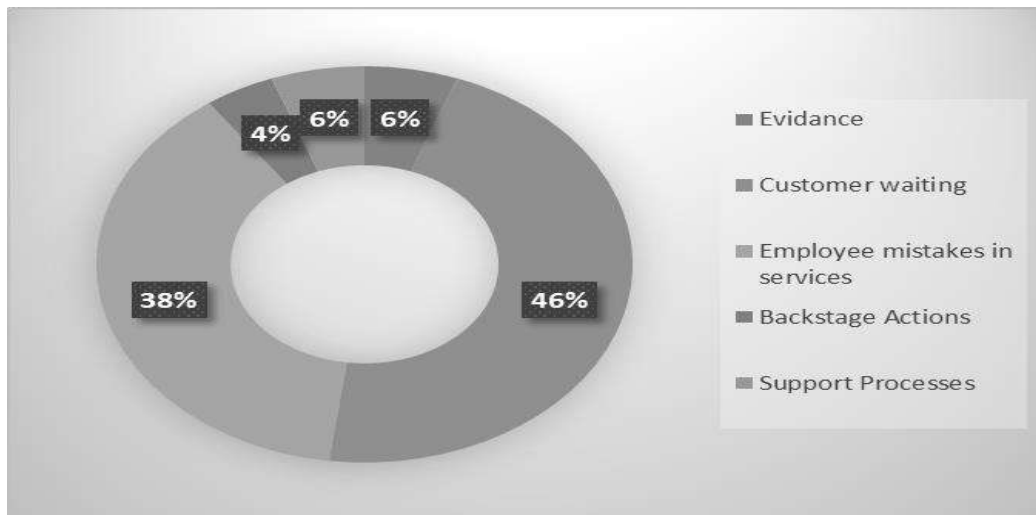
Pareto Analysis- It is based largely on the “80-20 rule”. As a decision-making technique, Pareto analysis statistically separates a limited number of input factors—either desirable or undesirable (Figure 4).

Figure 4: Pareto Analysis



Doughnut chart express the relationship of ‘part-to-whole’ where all parts represent 100% when collected together (Figure 5).

Figure 5: Doughnut Chart



Area Chart is a graphical representation useful for visualising how one or more quantity can change over time, by plotting values or data points. It is helpful for showing

key performance indicators. Area charts are used for analysing trends and making comparisons.

Problem: To study service quality

Solution: The data is gathered from the service company and plotted with a simple area chart as given Figure 6.

Figure 6: Area Chart



9.0 Conclusion

This research paper clears that there are specific activities that can help organisations derive value from their data. Digital transformation can help organisations to accelerate value creation in services through blue print and analytics. Researcher has observed previous literature available on service blue print for developing new services and to identify problems in existing services. Researcher has discussed challenges of big data in service blue prints. To improve customer experience in services researcher has recommended digital transformation of services through blue print. Paper discussed how descriptive, diagnostic, predictive, and prescriptive analytics can be used in service blue print to improve customer experience and reduce service gaps. Case study explained service quality problems. Managers on the basis of dashboard can take decisions to improve service quality. In future work researcher will study different types of services with reference to digital transformation.

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