



Effect of Innovative Banking Technologies on Customer Satisfaction and Operational Efficiency with reference to selected Commercial Banks in Bengaluru.

Konyn Tuba Lappay

M.com

Kristu Jayanti College

Abstract:

This study aimed to examine the effect of Innovative Banking Technologies on Customer satisfaction with special reference to Bengaluru. To achieve the objectives of this study, data were collected through questionnaire from a sample of 50 bank customers and 50 bank employees. These respondents were selected using convenience sampling method. The data collected from the questionnaire were analysed using Statistical tools such as mean, standard deviation, Spearman's Rank correlation, Simple Linear regression analysis and Mann Whitney U test using SPSS version 20. The results of this study indicated that the adoption of Innovative Banking technologies by banks will have a positive impact on customer satisfaction and will also help the banks to improve their operational efficiency. The finding of this study also indicates that the awareness and adoption of Innovative banking technologies especially Upgraded ATMs is high among banks compared to other banking technologies.

Keywords: Innovative Banking Technologies, Operational Efficiency, Customer Satisfaction, Canara bank and HDFC Bank.

I Introduction

1.1 Meaning: Electronic banking is the use of electronic and telecommunications network for delivering various banking products and services. Through e-banking, a customer can access his account and conduct many transactions using his computer or mobile phone.

1.2 Innovative Banking Technologies:

Upgraded ATMs: Usually ATMs provide receipts in form of paper for any transaction done through ATMs but the Upgraded ATMs have come up with e- receipts for any transaction where in customers will get an e-mail for their transactions performed.

Like E-wallets which requires smart phones and personal identification to perform banking transaction, similarly upgraded ATMs have come up with Card less access where NFC(near field communication) technology is built in smartphones which enable mobile phones to communicate with certain devices with in close proximity without internet connection and helps customers to perform their transaction with ATMs. The basic concept of an ATM was to eliminate the need for a human teller to service a customer. However, banks are making ATMs less automated by offering real-time video conferencing with a live teller.

Apple Store Style Experience: Today many people perform their transaction using mobile phones by downloading apps and through ATMs. The in-bank practice of the future might be more like shopping at an Apple store. The typical in-bank customer today is seeking help connecting a personal interaction. Banks hoping to increase transactions in the future are considering this transformation as a way for customers to involve more directly with the bank and its products, just like in an Apple store, leading customers to interact with tech kiosks for some transactions an reserving person to person interaction for answering questions or addressing needs unique to the individual consumer.

Blockchain technology: It is set to fundamentally transform banking and financial services. It decentralizes financial management from a central authority to a widespread network of computers. Financial transactions are broken down into encrypted packets, or blocks, which are then added to the chain of computer code and encrypted for enhanced cyber security.

Automated Financial services employees: Across major industries, robotic process automation, or RPA, is being used as part of an organization's digital transformation strategy to automate burdensome, high-volume and time-consuming business processes. Best suited for rule-based transactional and repetitive tasks involving structured and/or semi-structured data, logic-driven robots, or bots are used to capture and interpret information from existing user interfaces to process data, communicate with other systems, and execute tasks without affecting the organization's existing IT infrastructure

Wearables: Such as smart watches are poised to become the future of the retail banking experience, according to Samsung Insights. One example is that banks could use Bluetooth beacons to push personal greetings to customers' smart watches when they enter a banking location. Another type of wearable might be smart glasses for bank tellers, according to a report from Deloitte, which could process customer banking information for the employee as the employee is simultaneously doing other customer service tasks. Overall, consumer behaviour and smart device trends are steering banking technology advances in the direction of convenience.

Proliferation of Nonbanks: Banks are hoping that technology will allow them to deliver a faster, more transparent experience to consumers. A large portion of their resources, however, is necessarily dedicated to security, compliance and other industry-specific requirements, which has allowed non-banks — or financial service providers that are not regulated by the banking industry — to flourish, according to a 2016 report from market intelligence firm Greenwich Associates. Since these companies can devote a greater percentage of their assets to cutting-edge financial technology, they might be able to innovate more rapidly than traditional banks, attracting tech-savvy customers in the process.

II Review of Literature

A significant amount of research has been carried out both within and outside the country on E- Banking. It has been observed from the review of literature that many studies have been undertaken on E- Banking covering various aspects such as profitability, risk, efficiency and satisfaction of E-banking customers and operational performance of banks on different parts of the country. However, there are hardly any specific studies relating to Innovative Banking Technologies having its impact on Customer satisfaction and operational efficiencies of the banks. Hence, the researcher is interested to carry out the research on the effect of Innovative Banking Technologies on Customer Satisfaction.

2.1 Statement of the Problem:

The Importance of Electronic banking is growing day by day as it maximizes the advantage for banks and clients. And there are many significant changes taking place in customers' preference towards E-banking services and there is also a change in operational performance of bank employees after E-banking. This study is carried with an attempt to know the need for banks to identify the changes in customers' perception towards E-banking and need for the banks to adopt Innovative Banking technologies.

2.2 Scope of the Study

The study is confined to E- banking customers of selected commercial banks in Bengaluru. The study is confined to employees of selected commercial banks in Bengaluru. The Banks selected for study are Canara Bank and HDFC Bank.

2.3 Objectives of the study:

- To study the awareness and adoption level of Innovative banking Technologies among banks.
- To study the impact of innovative banking technologies on operational efficiency of banks.
- To study the impact of innovative banking technologies on customer satisfaction.

2.4 Hypothesis of the Study

1	H ₀	There is no significant difference in the Awareness level of employees of Canara and HDFC bank about innovative e-banking services.
	H ₁	There is a significant difference in the Awareness level of employees of Canara and HDFC bank about innovative e-banking services.
2	H ₀	There is no significant difference in the Adoption level of employees of Canara and HDFC bank about innovative e-banking services.
	H ₁	There is a significant difference in the Adoption level of employees of Canara and HDFC bank about innovative e-banking services.
3	H ₀	There is no significant difference in the opinion of Canara and HDFC bank employees towards operational efficiency on adoption of Innovative banking technologies.
	H ₁	There is a significant difference in the opinion of Canara and HDFC bank employees towards operational efficiency on adoption of Innovative banking technologies.
4	H ₀	There is no significant relationship between adoption of Innovative banking technologies by banks and customer Satisfaction.
	H ₁	There is a significant relationship between adoption of Innovative banking technologies by banks and customer Satisfaction.

III Research Methodology

3.1 Research Design: The study is empirical in nature and employs sampling method in assessing the impact of innovative banking technologies on operational performance and customer satisfaction of selected commercial banks in Bengaluru.

3.2 Sampling Design: The target population of the study are all the customers and employees of banks using E-banking services. Since the size of population is infinite and unknown to researcher the sampling technique used for selecting respondents is Convenience Sampling Technique. Under the study, the researcher uses CONVENIENCE SAMPLING METHOD for the collection of Primary data and the sample size is 100 respondents where 50 respondents are bank customers and 50 respondents are bank employees.

3.3 Data Collection: In order to understand the impact of Innovative banking Technologies on operational performance and customer satisfaction of selected commercial banks, the researcher has used Primary Data.

Primary Data: Primary Data is a first- hand data which is collected by the researcher through the structured questionnaire and Interview Schedule from a particular group of respondents, For the purpose of study the respondents will be customers and employees of E-banking, therefore the researcher prepared two set of questionnaire for data collection.

3.4 Tools used for Analysis: The primary data that is collected by the researcher was analysed using Non Parametric statistical tools such as Cronbach's Alpha Test, Spearman's rank correlation, Simple Linear regression and Mann Whitney U test.

IV Results and Discussion:

a) Demographic Profile of respondents

Table 4.1: Bank Customers

Variables	Category	Frequency	Percentage
Gender	Male	17	34.0
	Female	33	66.0
Age	21-30	28	56.0
	31-40	10	20.0
	41-50	7	14.0
	Above 51	5	10.0
Qualification	Basic education	10	20.0
	Graduated	22	44.0
	Post graduated	17	34.0
	Professional degree	1	2.0
Occupational Status	Salaried employee	14	28.0
	Business man	10	20.0
	Professional	5	10.0
	student	11	22.0
	House maker	10	20.0

Table 4.2: Bank Employees

Variables	Category	Frequency	Percentage
Gender	Male	35	70.0
	Female	15	15.0
Age	21-30	21	42.0
	31-40	20	40.0
	41-50	6	12.0
	Above 51	3	6.0
Qualification	Matric	6	12.0
	Graduated	16	32.0
	Post graduated	25	50.0
	Professional degree	3	6.0

Occupational Status	Bank manager	8	16.0
	Branch manger	13	26.0
	Officer	2	42.0
	cashier	8	16.0

b) **Descriptive Statistics:**

.Table 4.3: Descriptive Statistics of Adoption of Innovative banking technologies

Adoption of Innovative banking technologies	N	Mean	Std. Deviation
Upgraded ATMs	50	4.52	.50
Apple Store Style Experience	50	4.00	0.00
Blockchain Technology	50	4.02	.14
Automated Financial services employees	50	3.50	.54
Wearables	50	3.52	.50
Proliferation of Nonbanks	50	3.76	.87
Valid N (listwise)	50		

Inference: Table 4.3 shows The data is consistent as the mean value of all the variables are greater than standard deviation and the mean value of adoption of Upgraded ATM's is higher compared to other innovative banking technologies.

Table 4.4: Descriptive Statistics of Operational Efficiency

Descriptive Statistics			
Operational Efficiency dimensions	N	Mean	Std. Deviation
Time Taken in processing of transaction	50	2.060	1.2357
Complexity in transaction	50	2.260	.9216
Availability of staff at counter	50	1.820	.6289
Knowledge of staff about banks product	50	3.540	.8855
Level of accuracy in processing of transaction	50	3.780	.4647
Responding queries of the customers	50	3.720	.4965
Workload	50	3.960	1.0872
Valid N (listwise)	50		

Inference: The above table 4.4 explains that data is consistent as the mean value of all the operational efficiency dimensions is higher than standard deviation. Hence it can be inferred that data is consistent. And the mean value for 'Workload' is higher compared to all other dimensions

c) Mann Whitney U test:

H₀: There is no significant difference in the Awareness level of employees of Canara and HDFC bank about innovative e-banking services.

H₁: There is a significant difference in the Awareness level of employees of Canara and HDFC bank about innovative e-banking services.

Table 4.5: Awareness level of Innovative E-banking services among Bank employees

Awareness level	Mean Rank of Canara bank	Mean Rank of HDFC bank	Mann-Whitney U Test	Significant Value	Decision
Upgrade ATMs	19.50	31.50	162.500	.000	Sig.
Apple Store Style Experience	18.76	32.24	144.000	.000	Sig.
Blockchain Technology	31.24	19.76	169.000	.000	Sig.
Automated Financial services employees	26.00	25.00	300.000	.317	Not Sig.
Wearables	14.00	37.00	25.000	.000	Sig.
Proliferation of Non banks	13.50	37.50	12.500	.000	Sig.

Inference:

The above table 4.5 explains that there is a significant difference in the Awareness level of employees of Canara and HDFC bank about innovative e-banking services as the p value is < 0.05 . Except for 'Automated financial services employees' as the p value > 0.05 .

The awareness level towards Upgraded ATMs, Apple store style Experience, Wearables and Proliferation of Nonbanks is observed high among HDFC bank employees compared to Canara Bank employees with reference to their respective mean rank. Whereas, the awareness level towards Block chain technology is observed high among Canara Bank employees compared to HDFC bank employees and both the banks are equally aware of Automated Financial services employees.

H₀: There is no significant difference in the Adoption level of employees of Canara and HDFC bank about innovative e-banking services.

H₁: There is a significant difference in the Adoption level of employees of Canara and HDFC bank about innovative e-banking services.

Table 4.6: Adoption level of Innovative E-banking services

Adoption Level	Mean Rank of canara bank	Mean Rank of HDFC bank	Mann-Whitney U Test	Significant Value	Decision
Upgrade ATMs	13.50	17.500	12.500	.000	Sig.
Apple Store Style Experience	25.50	25.50	312.500	1.000	Not Sig.
Blockchain Technology	26.00	25.00	300.000	.317	Not Sig.
Automated Financial services employees	13.50	37.50	12.500	.000	Sig.
Wearables	13.50	37.50	12.500	.000	Sig.
Proliferation of Non banks	13.76	37.24	19.000	.000	Sig.

Inference:

The above table 4.6 explains that there is a significant difference in the Adoption level of employees of Canara and HDFC bank about innovative e-banking services as the p value is < 0.05 . Except Apple Store style experience and Block chain technology as the p value > 0.05 .

The adoption level towards Innovative Banking technologies such as Upgrade ATMs, Automated Financial services employees, Wearables, Proliferation of Non banks is observed high among HDFC bank employees compared to Canara bank employees. Whereas, the adoption level towards Innovative Banking technologies like Apple Store Style Experience and Blockchain Technology is observed equally among both the bank employees.

H₀: There is no significant difference in the opinion of Canara and HDFC bank employees towards operational efficiency on adoption of Innovative Banking technologies.

H₁: There is a significant difference in the opinion of Canara and HDFC bank employees towards operational efficiency on adoption of Innovative Banking technologies.

Table 4.7 Impact of Innovative banking technologies on Operational Efficiency

Operational Efficiency	Mean Rank of Canara Bank	Mean Rank of HDFC bank	Mann-Whitney U	Significant Value	Decision
Time Taken in processing transaction	14.02	36.98	25.5	.000	Sig.
Complexity in transaction	37.76	13.24	6.000	.000	Sig.
Availability of staff at counter	31.76	19.24	156.000	.000	Sig.
Knowledge of staff about banks product	31.76	19.24	152.000	.000	Sig.
Level of accuracy in processing of transaction	31.76	19.24	150.000	.000	Sig.
Responding queries of the customers	30.76	20.24	181.000	.001	Sig.
Workload	13.00	38.00	28.6	.000	Sig.

Inference:

From the above table 4.7 it can be inferred Operational Efficiency dimensions has p value < 0.05 for 'Time Taken in processing transaction' (U value = 25.5, p value=0.00), 'Complexity in transaction' (U value = 6, p value= 0.00) and 'Availability of staff at counter' (U value = 156, p value=0.00), 'Knowledge of staff about banks product' (U value = 152, p value= 0.00) and for 'Level of accuracy in processing of transaction' (U value= 150, p value=0.00). 'Responding queries of the customers' (U value = 181, p value= 0.01) and for 'Workload' (U value= 28, p value=0.00).Hence it can be inferred that there is a significant difference in the opinion of Canara and HDFC bank employees towards operational efficiency on adoption of Innovative Banking technologies.

Impact of Innovative Banking Technologies on Customer Satisfaction

d) Item Reliability Test

Table 4.8: Item reliability statistics

Constructs	Cronbach's alpha	No of items
Customer Satisfaction	0.871	4
Adoption of Innovative banking technologies	0.835	6

Inference:

The above table 4.8 explains that alpha coefficient of two variables value is more than 0.7 therefore the items considered for study is statistically reliable and valid.

e) Correlation Analysis

H₀: There is no significant relationship between adoption of Innovative banking technologies by banks and customer Satisfaction.

H₁: There is no significant relationship between adoption of Innovative banking technologies by banks and customer Satisfaction.

Table 4.9: Correlations

		Adoption level	Customer satisfaction	
Spearman's rho	Adoption level	Correlation Coefficient	1.000	1.000**
		Sig. (2-tailed)	.	.
		N	50	50
		Customer satisfaction	Correlation Coefficient	1.000**
	Sig. (2-tailed)		.	.
	N		50	50
	**. Correlation is significant at the 0.01 level (2-tailed).			

Inference:

The above table explain that there is a significant positive correlation between adoption of Innovative banking technologies by banks and customer Satisfaction as the r value = 1.00 and the correlation is significant with p value <0.01.

f) Regression Analysis

The Simple Linear Regression Model is carried out to predict the customer satisfaction when banks are adopting Innovative banking technologies.

Hypothesis Model:

Customer Satisfaction = $B_0 + B_1 * \text{Adoption of Innovative banking technologies}$

H₀: The Model is not Significant

H₁: The Model is Significant

Table 4.10: Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate	F	Sig.
1	.995 ^a	.991	.991		.054	5148.214	.000 ^b
a. Predictors: (Constant), adoption level							
b. Dependent Variable: customer satisfaction							

Inference:

From the above table 4.10 it can be inferred that model captures 99% of variation as the R square value is 0.99 and explains good prediction model and Anova test on the general significance of the model as the p value is less than 0.05, hence it can be inferred that Model is significant.

Table 4.11: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.950	.079		24.555	.000
	Adoption level	1.460	.020	.995	71.751	.000
a. Dependent Variable: customer satisfaction						

Inference:

Table 4.11 shows that unit change in independent variable adoption of Innovative banking technologies, banks can expect an average increase in Customer Satisfaction. The regression coefficient is statistically significant (t= 24.55 with significance value <0.05).

IV Findings, Suggestions and Conclusions:

5.1 Findings:

- The researcher also finds that adoption of innovative banking technologies i.e, Upgraded ATM's is high compared to other banking technologies.
- There is a significant difference in the Adoption level of employees of Canara and HDFC bank about innovative e-banking services.
- The researcher finds that bank employees of Canara and HDFC bank consider that innovative banking technologies will substantially reduce their workload and time taken in processing of transaction is very much reduced.
- There is a significant difference between operational efficiency of employees in Canara and HDFC Bank.
- There is a significant positive correlation between adoption of Innovative banking technologies by banks and customer Satisfaction.
- A change in independent variable (adoption of Innovative banking technologies) banks can expect an average increase in Customer Satisfaction.

5.2 Suggestions:

- Banks can implement innovative banking technologies as mentioned in the study like Upgraded ATMs, Apple Store Style Experience, Blockchain Technology, Wearables etc.
- Like Apple has taken security and convenience a step further by adding face recognition. Bordering on science fiction, the face recognition feature opens the phone and enables mobile payments without users having to remember increasingly complex passwords. Likewise Indian Banks can also adapt these innovative techniques to achieve customers' delightment and also to improve the standard of living of Indians.

5.3 Conclusions:

It is important for the banks to understand the changes in their sector in terms of information technologies and adapt to these changes in order to provide better service to their customers and satisfy their customize needs by adopting and implementing various innovative banking technologies that will assist the banks in rendering better and quality service to their customers.

References:

- Darazo Rabiou Ibrahim, Sirajo Ladan, Ahmed Usman Hafiz, Garba Murtala, “ Impact of E-banking on operational efficiency of Nigeria banks”, Human Resource Management Academic Research Society, Vol. 9, No. 2, 2019.
- Ejigu Simon Nahusenay, “E-Banking Service Quality and its Impact on Customer Satisfaction in State Owned Banks in East Gojjam Zon”; Ethiopia, Global Journal of Management and Business Research: B Economics and Commerce, Volume 16 Issue 8 Version 1.0, Year 2016, Published in USA.
- J.N Taiwo, M, Agwu “Operational Performance Of Commercial Banks In The Chinese Transitional Economy”, The Journal of Developing Areas, Vol. 44, No. 1, 2018.
- Kumar Kuldeep Rai, R.S. Dugar Anurag, “Impact of Service Quality on Customer Satisfaction and Loyalty in the Sector of Telecom Service Provider in Delhi-NCR”, International Journal of Innovative Technology and Exploring Engineering (IJITEE), Volume-8 Issue-8, June 2019.
- Mahdina Syed and Sargu Alina, “The Impact of Internet Banking on the Performance of Romanian Banks”, Procedia Economic and Finance, Volume- 20, No. 4, 2015.

