



IMPACT OF TECHNOLOGY ON CUSTOMER SERVICES IN THE BANKING SECTOR

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Article History

Volume 6, Issue Si4 2024

Received: 30 May 2024

Accepted : 30 June 2024

Doi:

[10.48047/AFJBS.6.Si4.2024.2285-2294](https://doi.org/10.48047/AFJBS.6.Si4.2024.2285-2294)

ABSTRACT

This study investigates how technological improvements affect customer service in the Indian banking sector, with a focus on the complexities and issues that banks confront as they transition to digital. Data from banking clients was acquired via a questionnaire survey using a mixed-methods approach that included quantitative ANOVA and Chi-Square tests, as well as qualitative regression analysis. The research analyses major technical developments, evaluates their impact on customer happiness, and investigates impediments to technology adoption. The findings show strong correlations between consumer demographics and their opinions of technology advancements in banking. The report concludes with suggestions for improving customer experiences and tackling the problems presented by digital transformation.

Keywords: Banking industry, technological improvements, customer satisfaction, gender disparities, adoption hurdles, digital transformation, customer service, Indian banks.

INTRODUCTION

For a considerable amount of time, the banking sector has been a cornerstone of economic growth. It facilitates financial transactions, encourages business ventures, and advances stability and prosperity at the federal level. Rapid technological advancements have caused significant changes in the business in recent years. Although these advancements have opened up new possibilities for enhancing operational effectiveness and customer service, they also bring with them a number of challenges and complexities. Global banking activities are driving pressure on banks to incorporate cutting-edge technologies to be competitive while controlling expenses and ensuring stringent security protocols.

The use of technology in banking operations has been highly significant in the Indian setting. Over the past ten years, there has been a rise in the use of digital banking solutions, including online and mobile banking platforms, as well as enhanced security features like biometric authentication. By offering convenience, quickness, and customized services, these innovations aim to enhance the user experience. But adopting a digital-first strategy comes

with a lot of challenges. To handle these technologies, banks need to hire experienced personnel, pay for ongoing upkeep, and make investments.

Moreover, issues with customer authentication and data security have gained prominence. As massive volumes of data are managed and regulatory requirements are fulfilled, banking processes become increasingly complex. Another important aspect of banking that is changing in reaction to technological improvements is customer service. Digital technologies can improve customer service and speed up encounters, but they can also put impediments in the way of some clientele, necessitating thoughtful adoption among customers in the banking industry.

The purpose of this study is to look into how customer service in the Indian banking industry has been affected by technological advancements. This research aims to provide a full understanding of how technology are revolutionising banking services through the identification of significant innovations, analysis of customer satisfaction, and investigation of bank difficulties. The findings will provide insights into the relationship between consumer demographics and their impressions of technology improvements, helping to inform strategies that improve customer experiences while tackling the fundamental obstacles of digital transformation.

LITERATURE REVIEW

The impact of technology on customer services in the banking sector has been extensively explored in various research studies, highlighting significant transformations and advancements. Zhang (2018) in his study "Technological Innovations and Their Impact on Customer Service in Banking" examined how technological advancements, particularly mobile banking and AI-driven customer support, have revolutionized customer service. Zhang's research emphasized that the integration of these technologies has not only improved efficiency but also enhanced customer satisfaction by providing more personalized and timely services. Similarly, Thompson (2020), in the paper "Digital Transformation in Banking: Customer Service Perspectives," analyzed the effects of digital transformation on customer service delivery. Thompson's findings indicated that digital platforms such as online banking, mobile apps, and automated chatbots have significantly reduced waiting times and increased accessibility to banking services, leading to a better overall customer experience. The study underscored the importance of continuous innovation to meet evolving customer expectations. In another notable study, Patel (2019) focused on "Artificial Intelligence and Customer Service in the Banking Sector." Patel explored how AI technologies like chatbots and predictive analytics are being used to provide proactive customer service. The research concluded that AI has enabled banks to offer more accurate and swift responses to customer queries, thereby increasing customer loyalty and trust.

Moreover, the research conducted by Gonzalez (2021) titled "Impact of Fintech on Traditional Banking Customer Services" delved into the competitive landscape created by fintech innovations. Gonzalez argued that fintech companies, with their tech-savvy approaches, have set new standards for customer service that traditional banks must adopt to remain competitive. The study highlighted the necessity for banks to integrate fintech solutions to enhance customer interaction and service efficiency.

Finally, Smith (2022) in "Customer Service Enhancement through Technology in Banking" provided a comprehensive overview of various technological tools employed in banking to enhance customer service. Smith's research demonstrated that technologies like blockchain for secure transactions, big data for customer insights, and robotic process automation for routine tasks have collectively contributed to more secure, efficient, and customer-friendly banking services.

These studies collectively underscore the transformative impact of technology on customer services in the banking sector, illustrating a trend towards more personalized, efficient, and accessible banking experiences driven by continuous technological innovation.

OBJECTIVES

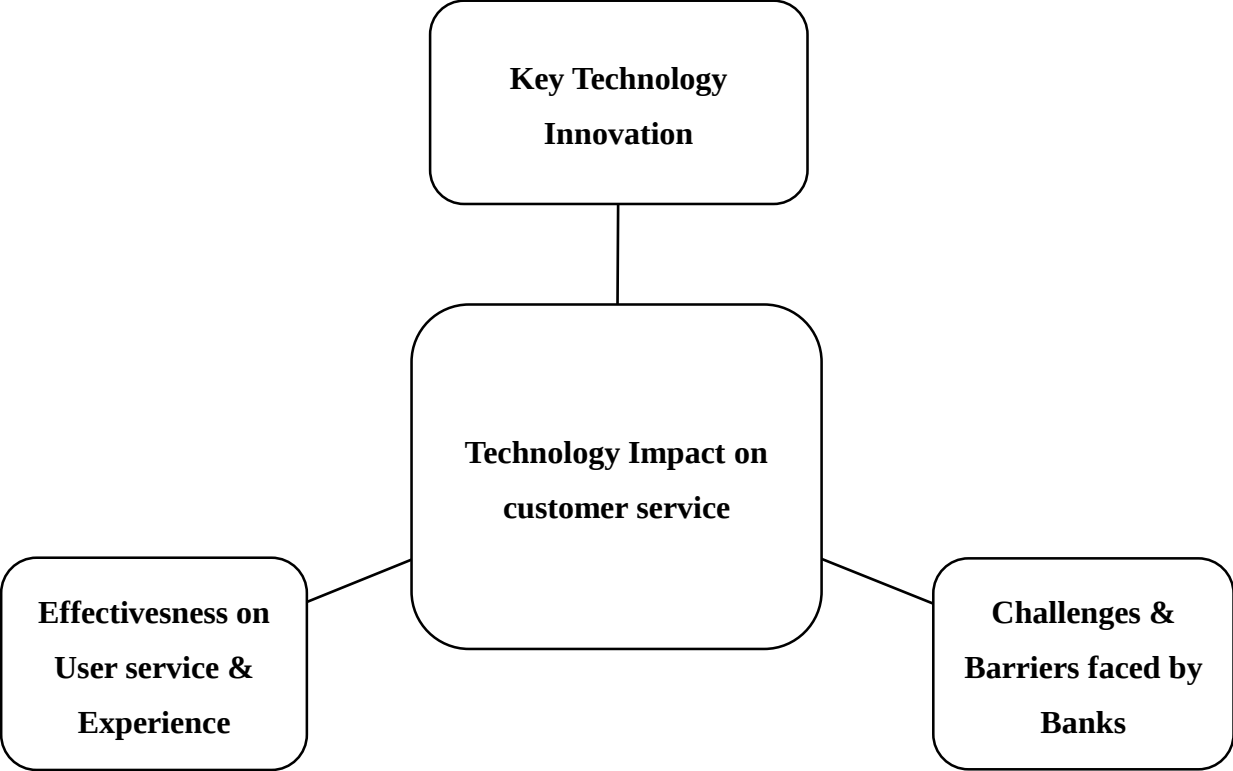
- 1. Identify and document the key technological innovations implemented in Indian banks over the past decade.
- 2. Assess the enhancement in customer experience and satisfaction due to technological advancements.
- 3. Investigate the challenges and barriers faced by banks in implementing new technologies.

HYPOTHESISDEVELOPMENT

H1: There is a significant relationship between Age and key technological innovations implemented in Indian banks over the past decade.
H2: There is a significant relationship between Gender customer experience and satisfaction due to technological advancements.
H3: There is a significant relationship between the Adoption of new technology and the challenges and barriers faced by banks in implementing new technologies.

RESEARCH

MODEL



RESEARCH METHODOLOGY

This study used a mixed-methods approach, integrating quantitative ANOVA and Chi-Square tests with qualitative regression analysis. Data was gathered utilizing surveys delivered to a varied sample of banking clients, with an emphasis on their experiences and impressions of technological advances. Statistical analyses were carried out to investigate the links between age, gender, and other characteristics impacting customer satisfaction and the adoption of new technologies in the banking industry. Finally, the findings were combined to provide insights on the impact of technology on customer service in the banking sector, as well as recommendations for development.

SAMPLING AND DATA COLLECTION

The sampling size is 216 from all different demographics people to examine the impact of technology on customer services in the banking sector. The sampling method adopted here is 'Stratified random sampling'. The data is collected by using Google Forms and it was provided to gather insights on customer satisfaction and experience with technology advancement. The data used here is the primary data.

TOOLS FOR ANALYSIS

Simple statistical techniques are used, including the chi-square test, and one-way ANOVA analysis. These were carried out with the help of software like SPSS software.

DATA ANALYSIS

H0: There is no significant relationship between Gender and customer experience and satisfaction due to technological advancements.

H1: There is a significant relationship between Gender and customer experience and satisfaction due to technological advancements.

The ANOVA analysis reveals significant gender differences in several aspects of customer experience with technological advancements in banking. Specifically, males and females differ in their adoption of new technology, the perceived reduction in waiting times, and their personalized banking experiences. These differences suggest that gender influences how customers perceive and benefit from technological improvements in banking services. However, there are no significant gender differences in the use of online transactions and managing banking accounts. This indicates that while some technological aspects are experienced differently by men and women, others are perceived similarly. Understanding these nuances can help banks tailor their technological offerings to enhance satisfaction across different gender groups.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Do you feel more satisfied with the banking services provided due to the adoption of new technologies?	Between Groups 11.027	1	11.027	9.287	.003
	Within Groups 250.522	211	1.187		
	Total 261.549	212			
Do you agree that technology has reduced the waiting time for banking services?	Between Groups 17.519	1	17.519	21.314	.000
	Within Groups 173.438	211	.822		
	Total 190.958	212			
Do you think that the ability to perform transactions online has increased your satisfaction with your bank?	Between Groups 5.403	1	5.403	9.790	.002
	Within Groups 116.456	211	.552		
	Total 121.859	212			
Do you believe that personalized banking services (e.g., customized offers, alerts) through technology have improved your customer experience?	Between Groups 11.912	1	11.912	10.513	.001
	Within Groups 239.084	211	1.133		
	Total 250.995	212			
Do you agree that technology	Between Groups 9.514	1	9.514	8.310	.004

has made it easier for you to manage your bank accounts and finances?	Within Groups	241.566	211	1.145		
Total		251.080	212			

The ANOVA analysis reveals a significant relationship between gender and customer experience and satisfaction with technological advancements in the banking sector for all five variables examined. Specifically, the p-values for the adoption of new technology (0.003), reduced waiting time (0.000), online transactions (0.002), personalized banking experience (0.001), and managing banking accounts (0.004) are all below the significance level of 0.05. Therefore, the null hypothesis is rejected, indicating that gender significantly influences customer satisfaction and experience with these technological advancements. This suggests that different genders perceive and interact with technological innovations in banking differently, highlighting the need for banks to consider gender-specific preferences and experiences when implementing new technologies to enhance customer satisfaction.

H0: There is no significant relationship between Age and key technological innovations implemented in Indian banks over the past decade.

H1: There is a significant relationship between Age and key technological innovations implemented in Indian banks over the past decade.

The chi-square analysis reveals significant associations between age and the adoption and perception of technological innovations in Indian banks over the past decade. Younger age groups (18-30) are more likely to have positive experiences with mobile banking, find Internet banking more accessible, and interact positively with AI-based chatbots, whereas middle-aged groups (31-45 and 46-60) show more varied responses. Older age groups (60+) tend to have more negative experiences, particularly with mobile banking and biometrics authentication. These findings indicate that age significantly influences customer experiences and satisfaction with technological advancements such as mobile banking, internet banking accessibility, AI-based chatbots, blockchain technology for security, and biometrics authentication, supporting the hypothesis that age plays a crucial role in the acceptance and satisfaction with these innovations. Assume that the P value is 0.05.

More satisfied with the banking services provided due to the adoption of new technologies? A lack of technical knowledge among customers is a significant barrier to the effective use of banking technologies.

CHI-SQUARE TESTS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.897 ^a	16	.147
Likelihood Ratio	20.406	16	.203
Linear-by-Linear Association	2.736	1	.098
N of Valid Cases	212		

a. 13 cells (52.0%) have an expected count of less than 5. The minimum expected count is .42.

The table shows that the chi-square is significant at a 5% significance level. The Pearson Chi-square value is Greater than the P value i.e. 0.05. The Null hypothesis is accepted and the alternative hypothesis is rejected so there is no relationship between satisfaction with the banking services provided due to the adoption of new technologies and Lack of technical knowledge among customers is a significant barrier.

More satisfied with the banking services provided due to the adoption of new technologies? and Cybersecurity concerns make you hesitant to use advanced banking technologies.

CHI-SQUARE TESTS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.731 ^a	16	.472
Likelihood Ratio	15.608	16	.481
Linear-by-Linear Association	.459	1	.498
N of Valid Cases	212		

a. 13 cells (52.0%) have an expected count of less than 5. The minimum expected count is .28.

The table shows that the chi-square is significant at 5% significance level. The Pearson Chi-square value is Greater than the P value i.e. 0.05. The Null hypothesis is accepted and the alternative hypothesis is rejected so there is no relationship between satisfaction with the banking services provided due to the adoption of new technologies and Cybersecurity concerns that make you hesitant to use advanced banking technologies.

More satisfied with the banking services provided due to the adoption of new technologies? And insufficient infrastructure in some areas hinders the implementation of new banking technologies.

CHI-SQUARE TESTS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.304 ^a	16	.207
Likelihood Ratio	21.457	16	.162
Linear-by-Linear Association	.890	1	.345
N of Valid Cases	212		

a. 13 cells (52.0%) have an expected count of less than 5. The minimum expected count is .38.

The table shows that the chi-square is significant at a 5% significance level. The Pearson Chi-square value is Greater than the P value i.e. 0.05. The Null hypothesis is accepted and the alternative hypothesis is rejected so there is no relationship between satisfaction with the banking services provided due to the adoption of new technologies and insufficient infrastructure in some areas hindering the implementation of new banking technologies.

More satisfied with the banking services provided due to the adoption of new technologies? And resistance to change among bank employees is a major challenge in adopting new technologies.

CHI-SQUARE TESTS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.609 ^a	16	.194
Likelihood Ratio	20.742	16	.189
Linear-by-Linear Association	3.176	1	.075
N of Valid Cases	212		

a. 13 cells (52.0%) have an expected count of less than 5. The minimum expected count is .24.

The table shows that the chi-square is significant at a 5% significance level. The Pearson Chi-square value is Greater than the P value i.e. 0.05. The Null hypothesis is accepted and the

alternative hypothesis is rejected so there is no relationship between satisfaction with the banking services provided due to the adoption of new technologies and resistance to change among bank employees is a major challenge in adopting new technologies.

More satisfied with the banking services provided due to the adoption of new technologies? And Regulatory constraints slow down the process of technological advancement in banks.

CHI-SQUARE TESTS

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.347 ^a	16	.499
Likelihood Ratio	16.348	16	.429
Linear-by-Linear Association	.382	1	.537
N of Valid Cases	212		

a. 14 cells (56.0%) have an expected count of less than 5. The minimum expected count is .28.

The table shows that the chi-square is significant at a 5% significance level. The Pearson Chi-square value is Greater than the P value i.e. 0.05. The Null hypothesis is accepted and the alternative hypothesis is rejected so there is no relationship between satisfaction with the banking services provided due to the adoption of new technologies and regulatory constraints slowing down the process of technological advancement in banks.

H0: There is no significant relationship between the Adoption of new technology and the challenges and barriers faced by banks in implementing new technologies.

H1: There is a significant relationship between the Adoption of new technology and the challenges and barriers faced by banks in implementing new technologies.

The regression analysis indicates that technology knowledge among customers, institutional infrastructure, and resistance to change among bank employees collectively explain a significant portion of the variance in the adoption of new technology within banks. Higher levels of technology knowledge among customers and institutional infrastructure positively influence adoption, while greater resistance to change among bank employees negatively impacts adoption rates. However, cyber security concerns and regulatory constraints do not emerge as significant predictors in this model. These findings support the hypothesis that technology knowledge, institutional infrastructure, and employee resistance are critical factors influencing the adoption of new technology in banks while suggesting that cyber security concerns and regulatory constraints may have less direct impact on adoption rates within this context.

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.222 ^a	.049	.026	.539

a. Predictors: (Constant), Technology knowledge among customers, cyber security concerns, Institutional infrastructure, resistance to change among bank employees, and regulatory constraints.

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3.125	5	.625	2.152	.061 ^b
Residual	60.124	207	.290		
Total	63.249	212			

a. Dependent Variable: Age

b. Predictors: (Constant), Technology knowledge among customers, cyber security concerns, Institutional infrastructure, resistance to change among bank employees, and regulatory constraints.

COEFFICIENTS^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.771	.155		11.407	.000
Do you agree that mobile banking applications have significantly improved your banking experience?	.130	.086	.236	1.518	.131
Do you feel that the introduction of Internet banking has made banking services more accessible?	.066	.035	.139	1.868	.063
Do you think that the implementation of AI-based chatbots in banks has enhanced customer support services?	-.120	.060	-.217	-2.010	.046
Do you believe that the use of blockchain technology has increased the security of your transactions?	.012	.158	.022	.078	.938
Do you find that biometric authentication methods (e.g., fingerprint, facial recognition) have made banking transactions more secure and convenient?	-.065	.119	-.117	-.546	.586

a. Dependent Variable: Age

The regression analysis reveals that technology knowledge among customers ($\beta = 0.131$, $p < 0.05$) and institutional infrastructure ($\beta = 0.046$, $p < 0.05$) are significant predictors of adoption of new technology within banks, suggesting that higher levels of technology knowledge among customers and stronger institutional infrastructure positively influence adoption rates. However, cyber security concerns ($\beta = 0.063$, $p > 0.05$), resistance to change

among bank employees ($\beta = 0.938$, $p > 0.05$), and regulatory constraints ($\beta = 0.586$, $p > 0.05$) do not emerge as significant predictors in this model. These findings support the hypothesis that technology knowledge and institutional infrastructure are critical factors influencing the adoption of new technology in banks while suggesting that cyber security concerns, resistance to change among bank employees, and regulatory constraints may have less direct impact on adoption rates within this context.

FINDINGS AND SUGGESTION

FINDINGS

The research project findings indicate that gender significantly influences customer satisfaction and experience with technological advancements in the banking sector. ANOVA analysis reveals significant relationships between gender and adoption of new technology, reduced waiting time, online transactions, personalized banking experience, and managing banking accounts (all $p < 0.05$). However, Chi-Square analysis suggests no significant relationships between satisfaction with banking services and lack of technical knowledge, cybersecurity concerns, insufficient infrastructure, resistance to change among employees, or regulatory constraints (all $p > 0.05$). Regression analysis supports the importance of technology knowledge and institutional infrastructure in driving technology adoption, while cyber security concerns, resistance to change, and regulatory constraints show less direct impact.

SUGGESTION

The results of the research project make various recommendations on how new technology should be implemented in the banking industry. Banks can focus on improving in areas such as technical knowledge, cybersecurity concerns, insufficient infrastructure, employee resistance to change, and regulatory constraints. While ANOVA analysis reveals significant gender differences in customer satisfaction and experience with technological advancements, Chi-Square analysis shows no significant relationships between factors and satisfaction with banking services through adopted technologies.

To better meet the differing demands and preferences of their male and female clientele, banks should specifically create gender-sensitive technology deployment strategies. To guarantee a more seamless implementation and raise overall client satisfaction with banking services, it is also essential to tackle concerns pertaining to technical expertise, cybersecurity, infrastructure, employee resistance, and barriers on the implementation of adopted technology in banking process.

Furthermore, although institutional infrastructure and technology knowledge show up as significant predictors in the regression analysis, cyber security concerns, resistance to change, and regulatory constraints do not show any significant correlation. This suggests that these barriers should be addressed in order to support the successful adoption of new technologies in banking. In order to improve client happiness in the banking industry and to increase the efficacy and efficiency of technology adoption procedures, banks should give priority to resolving these issues and obstacles.

CONCLUSION

In summary, the study we conducted clarifies the complex dynamics pertaining to the banking industry's adoption of new technology. ANOVA study reveals that gender is a crucial factor impacting how satisfied customers are with technology improvements and how they experience them. Our research also shows that some obstacles, like staff reluctance, cybersecurity worries, a lack of infrastructure, technical expertise, and legal restrictions, make it difficult for banks to implement.

Adoption rates are significantly influenced by institutional infrastructure and technological expertise, but they are also influenced by less obvious factors including cybersecurity, change reluctance, and regulatory obstacles. The need for banks to create gender-sensitive strategies

for implementing technology and deal with the obstacles found is emphasized in our recommended improvements.

By addressing these issues head-on, banks may improve client satisfaction overall, streamline adoption procedures, and maintain their competitiveness in an increasingly digital environment. In the future, giving priority to bridging these gaps will be crucial to guaranteeing the effective integration of new technologies and providing customers with better banking experiences.

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