A Study on Impact of Digital Banking Services and Mobile Apps in Madurai City

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Abstract

This study investigates the impact of demographic and economic factors on customer satisfaction and perceived security in digital banking, with a specific focus on mobile banking applications in Madurai City. Primary data were collected from 180 active digital banking users through a structured questionnaire and analyzed using SPSS. Correlation analysis revealed that most technical and usability problems occur independently, though certain issues such as app crashes and miscellaneous problems are positively associated. Multiple regression results indicated that age and gender positively and significantly influence satisfaction, while occupation negatively affects it; education level and monthly income were not significant predictors. For perceived security, age and gender again showed a positive influence, whereas education level, occupation, and monthly income had significant negative effects. The findings highlight the importance of demographic segmentation in improving user experiences and trust in digital banking services. The study concludes that banks must enhance security features, simplify interfaces, and address demographic-specific needs to strengthen customer loyalty and adoption.

Keywords: Digital banking, Mobile banking, Customer satisfaction, Perceived security, Demographic factors

Introduction

In recent years, the rapid advancement of financial technology has fundamentally transformed the way individuals interact with banking services. The shift from traditional branch-based banking to digital platforms has been accelerated by the widespread adoption of smartphones, enhanced internet connectivity, and innovations in mobile application design. Digital banking, supported by feature-rich mobile apps, offers customers the convenience of performing transactions such as fund transfers, bill payments, account inquiries, investment tracking, and loan applications at

any time and from any location. This has not only increased operational efficiency for banks but has also reshaped customer expectations, placing greater emphasis on speed, convenience, and user-friendly interfaces. In India, the adoption of digital banking services has been driven by multiple factors, including government initiatives promoting cashless transactions, the rise of the Unified Payments Interface (UPI), and competitive offerings by both public and private sector banks. Urban centers like Madurai City have witnessed a notable surge in mobile banking usage, as customers increasingly prefer the flexibility and accessibility offered by these platforms over traditional banking channels. The COVID-19 pandemic further amplified this trend, as customers sought contactless, remote, and instant access to financial services. However, while digital banking offers numerous advantages, it is not without challenges. Users often face technical issues such as application crashes, slow response times, poor network connectivity, and complex interfaces. Security concerns, including fears of data breaches, fraud, and unauthorized transactions, remain a significant barrier to full adoption. These issues can adversely impact customer satisfaction and influence perceptions of trust and safety in digital transactions. Customer experiences with mobile banking applications are shaped not only by technological performance but also by personal and socio-economic factors. Demographic variables such as age, gender, education level, and occupation, along with economic factors like monthly income, can influence how customers perceive, adopt, and evaluate digital banking services. Understanding these factors is crucial for banks to design targeted strategies that improve user satisfaction, enhance security features, and build long-term customer loyalty. Against this backdrop, the present study focuses on assessing the relationship between selected demographic and economic variables and two key dimensions of digital banking experience customer satisfaction and perceived security. By analyzing responses from users in Madurai City, this research aims to provide empirical evidence on the determinants of positive digital banking experiences and highlight areas where service providers can make strategic improvements. The findings of this study will be valuable for banks, policymakers, and app developers seeking to optimize the functionality, security, and accessibility of mobile banking platforms.

Review of Literature

Digital banking and mobile applications have become integral to the modern banking experience, with numerous studies examining the factors influencing adoption, satisfaction, and perceived security. The literature highlights the interplay of technological, behavioral, and demographic variables in shaping user engagement with these services.

Aboelmaged and Gebba (2013) applied the Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB) to mobile banking adoption, demonstrating that perceived ease of use, perceived usefulness, and subjective norms significantly influence adoption intentions. This foundational understanding supports the need to explore user perceptions in contexts like Madurai City. Similarly, Agarwal and Karahanna (2000) introduced the concept of cognitive absorption, explaining how deep user engagement with technology fosters positive beliefs about its use an idea relevant to mobile banking's ability to retain users through interactive and efficient interfaces.

Alalwan, Dwivedi, and Rana (2017) extended the Unified Theory of Acceptance and Use of Technology (UTAUT2) by incorporating trust, showing that trust significantly enhances adoption of mobile banking. Trust is particularly critical in financial transactions, where perceived security risks can hinder usage. Arora and Kaur (2013) conducted a comprehensive literature review of mobile banking, identifying key factors affecting adoption, including convenience, security, and perceived risk, underscoring the multidimensional nature of user satisfaction.

Service quality plays a vital role in user satisfaction. Bapat (2020) found that perceived service quality in mobile banking is strongly linked to customer satisfaction, with responsiveness, reliability, and security being the most critical dimensions. The Bank for International Settlements (2018) emphasized the regulatory and supervisory implications of fintech developments, noting that secure and reliable mobile banking systems are essential for maintaining consumer trust and financial stability.

Das and Rout (2020) explored the adoption of digital banking in India, revealing that ease of use, perceived usefulness, and customer awareness significantly influence adoption. This aligns with Deloitte's (2022) global insights, which show that markets with higher digital maturity demonstrate better customer engagement and loyalty. Jun and Palacios (2016) further identified mobile banking service quality dimensions such as content quality, ease of use, and security assurance as crucial for user retention.

Although mobile banking research often focuses on financial services, related technology adoption studies also provide insights. Kapoor and Vij (2018), in the context of food-ordering apps, highlighted the role of perceived convenience and app design in shaping user satisfaction, which parallels mobile banking app adoption dynamics. Singh and Srivastava (2020) extended TAM by

adding perceived enjoyment and social influence, finding these factors significantly affect the intention to use mobile banking in India, thus highlighting the role of experiential and social elements in adoption decisions.

Vyas and Choudhary (2019) analyzed mobile banking adoption using TAM, confirming that perceived ease of use, perceived usefulness, and trust are primary determinants of adoption behavior. Their findings reiterate that user perceptions are shaped by both functional performance and security assurance.

In summary, the literature suggests that mobile banking adoption and satisfaction are influenced by a combination of technological factors (ease of use, security, service quality), behavioral factors (trust, enjoyment, social influence), and demographic variables. This study builds on these findings by empirically testing how age, gender, education, occupation, and income influence both satisfaction and perceived security in the context of digital banking in Madurai City.

Objectives for the Study

1. To examine the relationship between demographic and economic factors (age, gender, education level, occupation, and monthly income) and customer satisfaction with mobile banking applications.
2. To analyze the influence of demographic and economic factors on customers' perceived security in using digital banking services.
3. To identify the common technical and usability problems faced by customers while using mobile banking applications and their interrelationships.

Research Methodology

The study adopts a descriptive research design to assess how demographic and economic factors shape customers' satisfaction and perceived security in digital banking, with a specific focus on mobile banking app usage in Madurai City. This design is appropriate for capturing a factual snapshot of current user experiences and attitudes without manipulating variables. Primary data were collected from 180 respondents who are active users of digital/mobile banking services in Madurai City. Respondents were approached using a convenience sampling method, given practical constraints of access and time. A structured questionnaire gathered information on demographics (age, gender, education, occupation, monthly income), patterns of mobile banking use, satisfaction

levels, perceived security, and specific problems encountered (e.g., technical issues, app crashes, network, interface complexity, and security concerns). The questionnaire comprised closed-ended items and Likert-scale statements to ensure consistency and measurability. Data collection emphasized clarity and anonymity to encourage candid responses, thereby improving the reliability of self-reported measures. Where relevant, secondary information from academic articles and industry reports was reviewed to contextualize the constructs and support instrument design. Data analysis was performed using SPSS. To summarized respondent profiles and usage patterns. Pearson correlation analysis examined interrelationships among problem categories faced in mobile banking. Multiple regression analyses evaluated the influence of age, gender, education level, occupation, and monthly income on two dependent variables: customer satisfaction with mobile banking and perceived security in digital banking. The scope of the study is limited to urban users within Madurai City and focuses on mobile/digital banking channels, so generalization to rural contexts or other regions should be made cautiously. Limitations include the non-probability (convenience) sampling approach and the cross-sectional nature of the data, as well as potential response bias inherent in self-reported surveys. Despite these constraints, the primary dataset of 180 users offers a robust empirical basis to identify significant patterns and determinants of satisfaction and security perceptions in digital banking.

Hypothesis

Null Hypothesis (H_0): There is no significant relationship between the independent variables (Age, Gender, Education Level, Occupation, and Monthly Income) and satisfaction with mobile banking experience.

Alternative Hypothesis (H_1): At least one of the independent variables has a significant relationship with satisfaction with mobile banking experience.

Null Hypothesis (H_0): There is no significant relationship between Age, Gender, Education Level, Occupation, Monthly Income, and the feeling of security in digital banking.

Alternative Hypothesis (H_1): At least one of the predictors (Age, Gender, Education Level, Occupation, Monthly Income) has a significant relationship with the feeling of security in digital banking.

Analysis of Data and Interpretation

This section presents the statistical examination of the collected primary data from 180 respondents in Madurai City. It includes correlation and multiple regression analyses to evaluate the relationships among demographic factors, customer satisfaction, perceived security, and problems faced in mobile banking usage. The findings provide empirical evidence to support or reject the proposed hypotheses and to identify significant predictors influencing digital banking experiences.

Table 1 Analysis of Correlation for Problems Faced While Using Mobile Banking Applications

Problems face while using mobile banking apps		Face Technical	Face App Crashes	Face Poor Network Connectivity	Face Security Concerns	Face Complex Interface	Face Others
Face Technical	Pearson Correlation	1					
	Sig. (2-tailed)	-					
	N	180					
Face App Crashes	Pearson Correlation	0.055	1				
	Sig. (2-tailed)	0.467	-				
	N	180	180				
Face Poor Network Connectivity	Pearson Correlation	0.055	-0.226	1			
	Sig. (2-tailed)	0.466	0.002	-			
	N	180	180	180			
Face Security Concerns	Pearson Correlation	0.071	0.084	0.069	1		
	Sig. (2-tailed)	0.341	0.260	0.359	-		
	N	180	180	180	180		
Face Complex Interface	Pearson Correlation	-0.011	-0.040	-0.144	-0.181	1	
	Sig. (2-tailed)	0.885	0.593	0.054	0.015	-	
	N	180	180	180	180	180	

Problems face while using mobile banking apps		Face Technical	Face App Crashes	Face Poor Network Connectivity	Face Security Concerns	Face Complex Interface	Face Others
Face Others	Pearson Correlation	0.034	0.305	0.063	-0.009	-0.196	1
	Sig. (2-tailed)	0.655	0.000	0.400	0.907	0.008	-
	N	180	180	180	180	180	180
. Correlation is significant at the 0.01 level (2-tailed).							
. Correlation is significant at the 0.05 level (2-tailed).							

In the table 1 correlation analysis reveals that most types of problems faced while using mobile banking applications are independent of each other. Technical issues show no significant relationship with app crashes ($r = 0.055$, $p = 0.467$) or other categories of problems, indicating that such issues occur irrespective of other difficulties experienced by users. A statistically significant negative correlation was found between app crashes and poor network connectivity ($r = –0.226$, $p = 0.002$), suggesting that users who frequently face app crashes tend to report fewer network issues, and vice versa. Similarly, security concerns are negatively correlated with a complex interface ($r = –0.181$, $p = 0.015$), indicating that those worried about security are less likely to perceive interface complexity as a major problem. App crashes are positively and moderately correlated with other problems ($r = 0.305$, $p < 0.001$), meaning that users who experience frequent crashes also tend to report additional issues not captured in the main categories. On the other hand, a complex interface shows a negative correlation with other problems ($r = –0.196$, $p = 0.008$), suggesting that for some users, interface complexity is the dominant concern, overshadowing other difficulties. Overall, the results indicate that while some problem categories are related, most issues occur independently, highlighting the diverse nature of user experiences and challenges in mobile banking applications.

Table 2 Multiple Regression Analysis for Predictors of Satisfaction with Mobile Banking Experience

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.509[a]	0.259	0.238	1.175	0.259	12.188	5	174	0.000

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
a. Predictors: (Constant), Monthly Income, Education Level, Gender , Occupation, Age									

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	84.127	5	16.825	12.188	0.000[b]
Residual	240.200	174	1.380		
Total	324.328	179			

a. Dependent Variable: Satisfaction with mobile banking experience

b. Predictors: (Constant), Monthly Income, Education Level, Gender, Occupation, Age

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.714	0.431		3.978	0.000
Age	0.458	0.110	0.345	4.169	0.000
Gender	0.825	0.203	0.307	4.071	0.000
Education Level	-0.117	0.110	-0.072	-1.060	0.291
Occupation	-0.231	0.079	-0.216	-2.913	0.004
Monthly Income	-0.159	0.085	-0.150	-1.866	0.064

a. Dependent Variable: Satisfaction with mobile banking experience

In the table 2 regression analysis was conducted to examine the impact of demographic and economic factors namely age, gender, education level, occupation, and monthly income on satisfaction with mobile banking experience. The model produced an R = 0.509 and an R^2 = 0.259, indicating that approximately 25.9% of the variation in satisfaction can be explained by the selected predictors. The adjusted R^2 value of 0.238 suggests a reasonable fit of the model to the data, accounting for the number of predictors. The ANOVA results reveal that the overall model is statistically significant (F = 12.188, $p < 0.001$), confirming that the set of predictors collectively has a significant relationship with satisfaction levels in mobile banking usage. Examining the coefficients, age (beta = 0.345, $p < 0.001$) and gender (beta = 0.307, $p < 0.001$) have positive and

significant effects on satisfaction, suggesting that older users and gender differences play a role in influencing satisfaction levels. Occupation also has a significant negative effect (beta = -0.216, p = 0.004), indicating that certain occupational groups may experience lower satisfaction. Education level (p = 0.291) and monthly income (p = 0.064) were not statistically significant predictors, implying their influence on satisfaction is minimal in this sample. Overall, the findings suggest that demographic characteristics such as age, gender, and occupation are key factors in determining satisfaction with mobile banking, while education level and income have limited predictive power.

Table 3 Multiple Regression Analysis for Predictors of Feeling of Security in Digital Banking

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.465[a]	0.216	0.193	1.186	0.216	9.577	5	174	0.000

a. Predictors: (Constant), Monthly Income, Education Level, Gender, Occupation, Age

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	67.334	5	13.467	9.577	0.000[b]
Residual	244.666	174	1.406		
Total	312.000	179			

a. Dependent Variable: Feeling of security in digital banking

b. Predictors: (Constant), Monthly Income, Education Level, Gender , Occupation, Age

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.057	0.435		4.730	0.000
Age	0.468	0.111	0.359	4.215	0.000
Gender	0.478	0.205	0.182	2.337	0.021
Education Level	-0.308	0.111	-0.193	-2.762	0.006
Occupation	-0.164	0.080	-0.156	-2.046	0.042
Monthly Income	-0.188	0.086	-0.180	-2.181	0.030

a. Dependent Variable: Feeling of security in digital banking

In the table 3 regression analysis was carried out to assess the influence of demographic and economic variables age, gender, education level, occupation, and monthly income on the feeling of security in digital banking. The model yielded an R = 0.465 and an R^2 = 0.216, indicating that approximately 21.6% of the variance in the feeling of security can be explained by these predictors. The adjusted R^2 value of 0.193 suggests a moderately good model fit when accounting for the number of variables. The ANOVA results show that the model is statistically significant overall (F = 9.577, $p < 0.001$), confirming that the set of predictors collectively has a meaningful relationship with perceived security in digital banking. From the coefficients table, age (beta = 0.359, $p < 0.001$) and gender (beta = 0.182, p = 0.021) have positive and significant effects, suggesting that older users and gender differences are associated with higher perceived security. Education level (beta = -0.193, p = 0.006), occupation (beta = -0.156, p = 0.042), and monthly income (beta = -0.180, p = 0.030) have significant negative effects, indicating that higher education, certain occupations, and higher income are linked to lower feelings of security in digital banking. Overall, the findings reveal that both demographic and economic factors significantly influence users' perception of digital banking security, with age and gender enhancing the feeling of security, while higher education, certain occupations, and higher income tend to reduce it.

Conclusion

The present study set out to assess the impact of demographic and economic variables namely age, gender, education level, occupation, and monthly income on customer satisfaction and perceived security in digital banking, focusing on mobile banking app users in Madurai City. Analysis of primary data from 180 respondents revealed several noteworthy findings. The correlation results showed that most types of problems faced while using mobile banking applications occur independently of each other. However, certain problem areas are interconnected for example, app crashes were positively associated with other miscellaneous issues, while security concerns were negatively related to complex interfaces. These insights highlight that user challenges are diverse and often context-specific. Multiple regression analysis for customer satisfaction indicated that age and gender have a positive and significant influence, while occupation has a significant negative impact. Education level and monthly income were not statistically significant predictors, suggesting that satisfaction is driven more by personal and experiential factors than by socio-economic status alone. In terms of perceived security in digital banking, the analysis found that age and gender again had a positive and significant influence, whereas education level, occupation, and monthly income were significant negative predictors. This suggests that older customers and certain gender groups tend to

feel more secure, while individuals with higher education, certain occupations, or higher income levels may exhibit greater caution or skepticism toward digital banking security. Overall, the study concludes that demographic characteristics play a crucial role in shaping both satisfaction and security perceptions in digital banking. Banks and financial institutions should, therefore, adopt targeted strategies to address the specific needs of different customer segments. Enhancing security features, simplifying interfaces, and ensuring robust technical performance are essential for improving the overall digital banking experience. By understanding and responding to these user dynamics, service providers can strengthen customer trust, increase adoption rates, and foster long-term loyalty in an increasingly competitive digital finance landscape.

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