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Adoption of Digital Banking of Digital Banking Tools and Their Impact on Customer Experience: A Case Study of Select Public Sector Banks in Rajasthan

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Abstract

The widespread use of "digital banking has fundamentally changed the financial services industry, putting customer satisfaction at the forefront of competition. This research aimed to find out the impact of digital banking adoption and service quality on customer satisfaction in public sector banks of Rajasthan. Through a quantitative research design, data were collected from bank customers using a structured questionnaire which was used to measure digital banking adoption, service quality, and customer satisfaction. Structural Equation Modelling (SEM) was used to investigate the interrelations among the constructs and to test the hypotheses. The findings showed that digital banking adoption and quality of services had a significant impact on customer satisfaction, which indicates the importance of reliability, security, responsiveness, and convenience in the domain of digital banking services." By including empirical evidence pertaining to public sector banks in Rajasthan, the study adds value to the existing literature, and provides operational guidelines for banking managers who are looking for improving customer experiences and loyalty. Moreover, the study reflects the need for continued innovation, customer-centered digital solutions and strategic improvements in the quality of service, in order to reach high levels of customer satisfaction and retention.

Keywords: Digital Banking, Customer experience, public sector banks, Rajasthan, Mobile banking, Internet banking, UPI, customer satisfaction.

1 Introduction

The global banking sector has experienced a paradigm shift in the last two decades due to the rapid development of digital technologies and the rise in the use of digital platforms by customers. Digital transformation has evolved from being just an operational enhancement to becoming a strategic imperative for financial institutions in order to stay competitive in a technology-driven world (Uribe-Linares, et al., 2023). Digital banking which includes online banking portals, mobile applications and other self service technologies has changed the nature of customer-bank interaction radically. Customers now have expectations of instant access to services, seamless transaction processing and secure handling of their financial data.

In emerging economies like India, the transition to digital banking has been very important because of the rapid penetration of smart phones, increasing internet connectivity, and the government's emphasis on financial inclusion. This transformation has led to more convenience as customers can do their banking transaction at any time and place and hence less need to go to banking branches (Mbama et al., 2018). However, along with the opportunities, banks are faced with new challenges such as ensuring cybersecurity, system reliability and creating user-friendly interfaces that meet the diverse needs of customers (Khashman, 2023).

Research during the last decade has proven that the quality of service is a crucial factor for customer satisfaction and loyalty in digital banking settings. Several studies have stressed that the reliability of services -the capacity

to provide consistent and error-free transactions- is one of the most influential aspects behind the customer's perception (Jaiwani et al., 2022). If banking platforms don't work smoothly or seem to be down for more than occasional periods of time, then customers will lack confidence and be less likely to engage. Security, another important factor, is a must because customers expect their sensitive data, including personal and financial information, to be completely safe from breaches and fraud. Studies have shown that breaches of security can cause serious loss of trust and thus lower customer satisfaction and jeopardise customer retention (Gill et al., 2021; Alfarizi, 2023).

Ease of use is another service quality dimension which has been strongly associated with satisfaction and adoption rates. Customers like digital platforms that are intuitive, easy to navigate and easy for people of various ages and technological levels to use. A study conducted in Indonesia and Vietnam discovered that the platforms with easy interfaces and personalised suggestions significantly increase customer experience and promote repetitive use and use (Duc, 2022; Alfarizi, 2023). Perceived service quality also depends on responsiveness or how fast the banks are to respond to the customer question or grievances, and in the process, reduce the negative effects of service failures (Ankit, 2011).

Furthermore, due to the literature, the emphasis is made on the fact that digital transformation does not only imply automation, but it includes the reshaping of the customer experience. Uribe-Linares et al. (2023) highlighted that digital transformation generates a higher customer engagement, in particular, when it brings in interactive features, such as real-time transaction notifications, chatbots with AI capabilities and predictive financial solutions. In the same manner, Mbama et al. (2018) have demonstrated that the customization of services, usability, and brand trust play a principal role in enhancing not only satisfaction but also bank performance on a financial level. This individualisation of services (individual recommendations of products and proactive resolution of issues) makes customers experience value and, therefore, their emotional attachment to the bank becomes more powerful (Duc, 2022).

With these developments, various obstacles that fail to allow the complete adoption and use of digital banking services remain. According to Abuhasan and Moreb (2021), the resistance to the use of the digital platforms is primarily because of technological unfamiliarity particularly among the old or least tech savvy customers. However, privacy concerns are still a huge barrier with the public becoming much more aware of data breaches and cybercrime. These challenges emphasise the importance of banks taking a customer-centric approach to banking that includes a combination of secure technology and effective communication and education initiatives.

Another dimension that has been explored by past research is “the impact of digital banking on customer loyalty and retention. As per different studies, it was observed that if the customers remain satisfied then they are likely to continue using digital services and they are likely to recommend the services to others (Jaiwani et al., 2022)”. Conversely, both negative word-of-month and customer churn that may arise because of system failures or security breaches can be felt on the long-term basis of a bank dip (Gill et al., 2021).

Considering this background, there are clear reasons to examine “the correlation between the use of the digital banking services and the two most important outcomes, including customer satisfaction and perceived quality of services. The body of available literature has examined the various dimensions individually, but limited few studies have integrated the dimensions to a clear model of structure to discern how digital adoption will result to the satisfaction, and the perceptions of the quality of the service provided at the same time.” This is particularly fitting in financial institutions that have a presence in the emerging markets where the process of digital transformation is still infancy and the expectations of the customers are rapidly changing.

The current research paper seeks to fill this gap by experimentally analysing the impact of the digital banking adoption on the level of customer satisfaction and the perceived service quality. By using structural equation modelling, this research will give a holistic view of direct effect of digital adoption to these two constructs. Furthermore, this study will assist in identifying the dimensions of service quality that are more strongly related to satisfaction in the digital context, such as reliability, security, responsiveness, and ease of use.

The importance of this research is that it can help inform policymakers, “bank managers and technology designers

on how to implement strategies that enhance customer experience, trust and broader adoption of digital banking. By providing personalised, secure and user friendly services, banks can not only improve satisfaction levels, but also build and maintain strong long-term relationships with their customers to remain competitive in an increasingly digital financial ecosystem (Karyağdı, 2022)".

In summary, the book adds to the increasing knowledge about digital banking because it integrates the interplay between adoption, satisfaction, and quality of services. The insights generated from this work will be valuable in helping banks minimise service gaps and mitigate the risks associated with digital transformation and leverage the technology to create superior value for customers.

2 Review of literature

"Digital transformation and its impact on customer satisfaction in the banking sector have been a subject of much interest for scholars from a variety of geographical locations. Kaur et al. (2021) carried out a study in Northern India where they used the SERVQUAL model to identify the risk factors affecting the satisfaction from the digital banking services. Their survey of 222 people revealed that reliability was the most important factor to be listed as a determinant of the satisfaction and then tangibility and responsiveness". Despite the convenience of digital banking to customers, the study admitted that the difficulties involved in the process of changing to new systems may adversely affect customer retention and satisfaction. The authors therefore suggested that a competitive advantage over risk related issues should be placed on the following recommendations: banks should offer secure, personalised and usable services.

The article by Sari et al. (2019) focuses on the quality-user satisfaction relationship on e-service in the position of mobile banking using data of 146 respondents. To them, security, cost and ease of use were among the main factors to consider when judging the level of satisfaction whereas reliability, responsiveness and usefulness had a comparatively lesser impact. "The authors hypothesised that banks ought to work on ensuring enhanced security and cost-efficiency to enhance user satisfaction and encourage the use of mobile banking. In the same vein, in the article by Kumalasari et al. (2022), the authors investigated the impact of system quality, information quality, service quality on customer satisfaction and customer loyalty in mobile banking. They were able to survey 176 people who used the service and they observed that all the three dimensions of quality significantly influenced customer satisfaction that subsequently resulted in customer loyalty". This study emphasised the need to improve these areas of quality so that banks provide a better user experience and interaction with mobile platforms to gain a more customer experience.

Nguyen et al. (2022) explored the impact of the dimension of "e-service quality; responsiveness, security and interface quality, on the customer attitude and behavioural intention towards video teller machine (VTM) services". According to the statistics collected during the work with 450 Vietnamese interviewees, the authors discovered that these variables positively impacted the perception of usefulness and ease of use, which culminated in an improved uptake of the same by the customer. These findings stated the potentials of enhancing the quality of e - service in such a way that the success of VTM in the banking industry can be expedited. With the assistance of various dimensions such as ease of use, reliability, security, etc. a customer satisfaction survey of the e-banking services was made (Jaiwani et al., 2022) based on 200 participants it was seen that the quality of service produces a remarkable impact on the level of satisfaction and behavioural intention. The authors suggested that the banks should focus more on reliability and security so as to increase customer satisfaction and decrease the number of customers moving out to competitors in this new competitive e-banking environment. "Mbama et al. (2018) considered the attitude of bank managers in UK regarding the impact of digital banking on customer experience and financial results. Their results found service customisation, perceived usability and brand trust to be key determinant of customer satisfaction and loyalty. The research suggested that digital banking solutions needed to be quality- and innovation-oriented in order to capitalise on the customers and financial performance".

Pristiyono et al. (2022) conducted a research on the bank industry and digital transformation, relationship of trust and satisfaction in Indonesia. The survey of 200 people revealed that trust was at the highest position of causes of

satisfaction and loyalty. The authors concluded that constant investment in a safe customer-centric digital solution was the only way of achieving sustainable competitive advantage. The article by Abuhasan and Moreb (2021) examined the effect of the digital transformation technologies on the customer experience in Palestine. Their results revealed that the lack of knowledge about digital tools and low level of privacy were the main challenges to customer satisfaction. The paper has highlighted that financial institutions should develop customer-focused digitalisation strategies, address technological distances and enhance data protection to generate customer satisfaction and confidence. In the same vein, Duc (2022) also investigated the digital banking satisfaction using SERVQUAL dimensions in Vietnam. The analysis found the reduction of response time and personalisation of services to be highly significant to customer satisfaction and thus customised approach to consumer needs is of paramount importance in a highly dynamic digital world. The article by Hammoud et al., 2018, researched the quality of e-banking in Lebanon and its connexion to customer satisfaction. Reliability, efficiency, and security were the important aspects which emerged out of the study. According to their findings, further development of those dimensions might significantly enhance satisfaction and also give banks a competitive edge.

Jaiwani et al. (2022) "talked about the connexion between e-banking services and customer satisfaction of various banking entities. Three important areas of service quality, viz. ease of use, reliability, and security were under attention of the study and their effects on customer retention and loyalty were considered". The findings revealed that reliability was the most critical aspect that affected customer satisfaction since the customers were highly dependent on continuous and correct banking services. The other factor to consider was security because, in most cases money information is sensitive, and customer information is critical to ensure protection. Also, convenience and simplicity in manoeuvring around the online platforms also proved to make the entire banking experience better. According to the outcomes of these findings, the authors proposed that improving the reliability of services was one of the main strategies that banks needed to work with in order to meet customer expectations and establish long-term relationships.

Taking this perception as a starting point "Uribe-Linares et al. (2023) investigated the impact of the digital transformation on the behaviour of financial sector consumers. The study validated the use of quantitative data by demonstrating the existence of a positive effect by digital banking tools on customer satisfaction and customer loyalty using quantitative data, through the application of mobile applications and online banking platforms". Customers have said that the level of convenience has been on the rise, and it has become more easily accessible to customers, faster and more accessible. Besides, more interactive features, such as real-time notifications and artificial intelligence customer support, made the experience more engaging and helped it be improved. The researchers reached such a conclusion that the digital transformation becomes a component of the modernisation of the banking activities and the delivery of services which is more customer-focused.

Similarly, Mbama et al. (2018) investigated the impact of digital banking services on customer and financial performance of UK banks. The researchers discovered that three subscribes across the customer satisfaction and retention investigation are service customisation, platform usability and brand trust. Differentiated offerings could cater to the needs of each, the usability of the experiences would enable easy access to the digital platforms, and trust would make the customer develop confidence in the reputation and safety of their data held by the bank. All these factors led to the improved customer experience and positively affected the financial results of the banks.

Ankit (2011) focused on the factors that influence the level of online banking satisfaction, with a specific focus on reliability, security, and responsiveness. The investigation highlighted reliability as a key component in the provision of consistent and error free services, thereby having a direct impact on customer trust. Security was also considered important because clientele expected information (personal and financial) to be protected. Responsiveness, which is defined as the ability to answer queries in a timely manner, also had an influence on levels of satisfaction. The study concluded that systematic improvements across these dimensions could strengthen relationships among the banks and their customers. Duc (2022) has carried out a parallel inquiry into the field of digital banking in Vietnam, especially focusing on the responsiveness and personalization. Responding to the need for quick resolution of queries and proactive problem-solving, there was a strong appreciation of immediacy on the part of the customers. Personalization, which includes customised financial advice and

recommendations, was found to significantly increase levels of satisfaction and loyalty. The study has recommended that Vietnamese banks ought to adopt customer-centric approaches and invest in the interaction technologies to address the evolving customer expectations and achieve customer loyalty.

Gill et al. (2021) examined the relationship between the quality of the mobile banking application and e-loyalty with the intermediation of e-satisfaction. The analysis has shown that reliability and trust were the most significant variables of customer loyalty, and users appreciated secure applications without problems. Functionality and trustworthiness influenced the level of satisfaction with the app significantly more than the level of satisfaction with aesthetics and design, which suggests that functionality and trustworthiness are the crucial factors of consumer interest rather than aesthetics and design. The authors established that the mobile applications ought to be developed by ensuring trust and security to subsequently create customer loyalty. Karyaoglu (2022) assessed how digital transformation affects the bank performance efficiency and customer satisfaction in Turkey in his paper. The research established that the operational processes have been significantly improved, transaction times have been reduced, and service delivery in regard to the digitalization has been enhanced. Nonetheless, it also evoked such problems as the issues of cybersecurity and automation as a threat of job loss. The study proposed the holistic risk management strategy and reskilling employee programmes, and they allowed the staff to gain the most out of the digital transformation.

In the study framework of the Sharia banking practise in Indonesia, Alfarizi (2023) came to a conclusion that the quality of elements presented in a service influences customer satisfaction and loyalty. It was identified that the ease of use and the security feature were among the dimensions, which made the most significant impact, as the customers could navigate platforms without issues and feel safe about their data. The research indicated that enhancement of these dimensions would help a great deal in enhancing customer retention within a competitive market place. The association between the quality of services and customer satisfaction in Jordanian banks has been explored by Khashman (2023); the research concentrated on such dimensions as reliability, security, and responsiveness. The results indicated that delivery of safe and error free service was a significant factor in the development of customer trust and satisfaction. The study also noted the need to focus on these dimensions of service quality to the banks that inevitably desire to be competitive and to make loyalty.

The level of customer satisfaction among the Pakistani public and private sector banks was compared by Saif and Naeem (2011). Indeed, according to their findings, the performance of the private banks was always better than their public counterpart as far as the quality of their services and the retention of customers is concerned. The research has shown that services delivery in the state banks has serious shortcomings that need to be removed and proposed the implementation of certain quality management programmes to remove these shortcomings.

Lastly, Zouari and Abdelhedi (2020) conducted research on how “the digital transformation influences customer satisfaction in the Islamic banking industry in Tunisia. The research indicated that digital solutions complying with the Sharia principles are very important to win customer trust. According to their findings, the banks can enhance the level of customer satisfaction with digital banking services in accordance with the religious expectations and therefore build trust and loyalty within the Islamic banking context”.

3 Research hypotheses

I **H1:** Customers of public sector banks in Rajasthan demonstrate a significant level of adoption of digital banking services.

II **H2:** The adoption of digital banking services has a significant positive impact on customer satisfaction in public sector banks.

III **H3:** The adoption of digital banking services significantly enhances the perceived service quality of public sector banks.

4 Study Methodology

The present study aimed at examining the interrelation between "digital banking adoption, service quality and customer satisfaction in the context of public sector banking in Rajasthan. A quantitative methodology approach was used to systematically gather and analyse the empirical data from the bank customers. The target population included account holders and regular users of digital banking services across multiple public sector banks operating in Rajasthan. A structured questionnaire was developed based on established scales from previous studies, including SERVQUAL dimensions and measures of digital banking adoption and customer satisfaction". The questionnaire was pre-tested for reliability and clarity through a pilot study to ensure the validity of the items.

A non-probability convenience sampling technique was adopted, and a total of 300 respondents were selected from urban and semi-urban branches of various public sector banks. The data collection involved face-to-face administration of the questionnaire at bank branches, as well as online distribution to customers actively using digital banking platforms. Respondents were informed about the purpose of the study, and their consent was obtained to ensure ethical compliance.

Structural equation modelling (SEM) was employed in this work to "examine the interrelations among service quality and customer satisfaction latent variables of digital banking adoption. The estimation of the parameters was done by implementing the maximisation likelihood (ML) methods alongside the NLMINB optimisation algorithm to summarise both measurement as well as structural parameters of the model. Construct reliability and validity were investigated using a factor loading, composite reliability and average variance extracted (AVE). The binding of hypothesis was conducted to determine how the digital banking adoption influenced the perceived service quality and the resulting satisfaction based on the perceived service quality. Every analysis has been conducted on the basis of an appropriate statistical software concerning the stringent validation of the empirical finding".

This methodological arrangement helped to systematically estimate the effects of digital banking services on customer experience in government sector banks of Rajasthan, and to make conclusions, which are applicable in enhancing quality of service and consumer satisfaction.

5 Research objectives

I To examine the level of adoption of digital banking services among customers.

II To analyze the impact of digital banking adoption on customer satisfaction.

III Investigating the influence of digital banking adoption on service quality.

Table 1 – Estimation Method

Estimation Method	ML
Optimization Method	NLMINB
Number of observations	300
Model	Adoption of Digital Banking =~ CEASS1 + CEASS2 + CEASS3 + CEASS4 + CEASS5 + CEASS6 + CEASS7 + C EASS8 + CEASS9 + CEASS10
	Satisfaction =~CS1+CS2+CS3+CS4+CS5+CS6+CS7+CS8+CS9+CS10
	Service Quality =~ SERQ1 + SERQ2 + SERQ3 + SERQ4 + SERQ5 + SERQ6 + SERQ7 + SERQ8 + SE RQ9 + SERQ10
	Satisfaction ~Adoption of Digital Banking
	Service Quality ~Adoption of Digital Banking

The current research used a structural equation modelling (SEM) methodology to test the connexion between a "digital banking adoption, a customer satisfaction, and the service quality. The method of Maximum Likelihood (ML) was used in estimating the model which is one of the most accepted estimation techniques in SEM which determines the values of the parameters that enable the observed data to be most likely. In order to provide the parameter estimates in the most efficient way possible, the NLMINB algorithm was used and guarantees that even estimates obtained with a relatively intricate model structure converge. It was analysed using 300 observations, which is a relatively strong sample size, and which can give meaningful and reliable statistical statistics to the specified number of latent variables and observed indicators.

The measurement business of the model included three latent constructs, which were Adoption of Digital Banking, Satisfaction, and Service Quality. The Digital Banking adoption was operational as ten measured variables (CEASS1-CEASS10) that were aimed at assessing the degree to which customers respond and use digital banking services. Satisfaction was also assessed using ten indicators (CS1 -CS10) which were taken to have different dimensions of customer satisfaction including overall experience, trust, and probability of repeat usage. Ten observed variables (SERQ1- SERQ10) were used to measure Service Quality, presumably including major dimensions of service quality such as reliability, responsiveness, assurance, empathy, and tangibles. This confirmatory factor analysis also provided that each of the latent constructs had several indicators that were theoretically relevant and this helped in enhancing the reliability and validity of the model.

The element of the structural model defined direct causal relationships between Adoption of Digital Banking and Satisfaction as well as Service Quality. The specification enabled this study to hypothesise the relationship between a greater degree of digital banking adoption and enhanced customer satisfaction and the perception of better service quality. Meaning, the model investigated whether more satisfied with their banking experience customers that interact more with the digital banking channels also have a more positive outlook on the service quality of the bank. The importance and scale of such paths would offer valuable information about the impact of the digital transformation on the attitude and assessment of the customers.

In summary, the model offered a comprehensive framework linking digital banking adoption with two key outcome variables—satisfaction and service quality—while controlling for measurement error through the use of latent variables. If the model achieves a good overall fit, as indicated by standard fit indices such as CFI, TLI, RMSEA, and SRMR, it would provide strong empirical support for the proposition that digital banking adoption plays a vital role in enhancing customer satisfaction and shaping perceptions of service quality. Such findings would have practical implications for banks seeking to improve customer experience and service delivery in an increasingly digitalized financial environment".

Table 2 - Parameters estimates

				95% Confidence Intervals				
Dep	Pred	Estimate	SE	Lower	Upper	β	z	p
Satisfaction	Adoption of Digital Banking	0.97	0.185	0.607	1.33	0.682	5.24	<.001
Service Quality	Adoption of Digital Banking	0.868	0.169	0.536	1.2	0.667	5.13	<.001

The parameter estimates presented in Table 2 provide important insights into the structural relationships specified in the model. "The first path examined was from Adoption of Digital Banking to Satisfaction. The unstandardized estimate for this relationship was 0.97, with a standard error of 0.185, yielding a z-value of 5.24. The 95% confidence interval ranged from 0.607 to 1.33, and the p-value was reported as < 0.001, indicating that this effect was highly statistically significant. The standardized path coefficient (β) was 0.682, which reflects a strong positive

effect of digital banking adoption on customer satisfaction. This suggests that as customers increasingly adopt digital banking channels, their overall satisfaction with banking services rises substantially. Similarly, the second structural path, linking Adoption of Digital Banking to Service Quality, was also found to be positive and significant. The unstandardized estimate was 0.868, with a standard error of 0.169, resulting in a z-value of 5.13. The 95% confidence interval (0.536 to 1.20) did not cross zero, reinforcing the statistical significance of the relationship. The standardized path coefficient (β = 0.667) indicated a strong positive association, implying that greater adoption of digital banking is associated with more favorable perceptions of service quality. In other words, customers who actively engage with digital banking platforms tend to evaluate the bank's services as being of higher quality, possibly due to improved convenience, responsiveness, and efficiency offered by digital channels.

Taken together, these results confirm the central hypothesis that adoption of digital banking positively influences both customer satisfaction and perceptions of service quality. The strength and significance of these relationships suggest that digital transformation initiatives in banking are not merely technological upgrades but also powerful drivers of customer experience enhancement. The relatively high standardized coefficients (β > 0.65 in both cases) imply that digital adoption explains a substantial portion of the variance in satisfaction and service quality.

From a managerial perspective, these findings underscore the importance of investing in user- friendly, reliable, and secure digital banking platforms. Banks that succeed in promoting digital adoption among their customers are likely to see measurable improvements in customer satisfaction and service quality evaluations, which in turn can lead to stronger customer loyalty, positive word-of-mouth, and competitive advantage in the marketplace".

Figure 1 - Path diagram

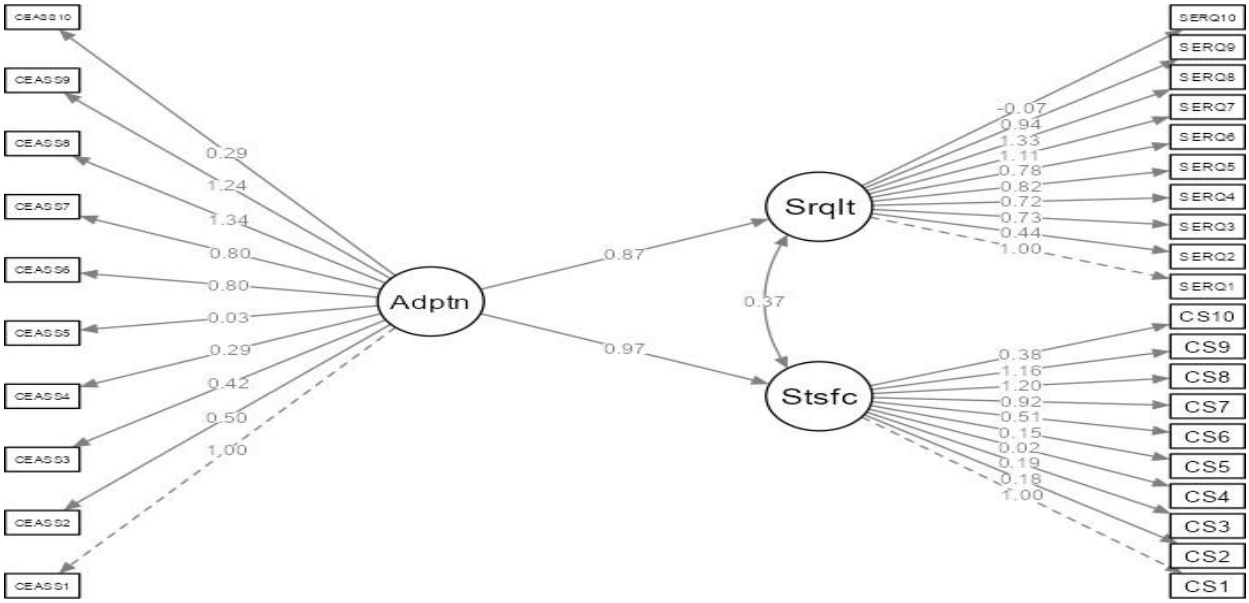

Table 3 - Measurement Model

				95% Confidence Intervals				
Latent	**Observed**	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**z**	**p**
Adoption of Digital	CEASS 1	1	0	1	1	0.48942		
	CEASS 2	0.5005	0.1763	0.15495	0.846	0.20848	2.839	0.005

Banking	CEASS 3	0.4188	0.1774	0.07115	0.766	0.17019	2.361	0.018
	CEASS 4	0.29	0.1596	-0.0228	0.603	0.12885	1.817	0.069
	CEASS5	0.0256	0.1414	-0.25157	0.303	0.01256	0.181	0.856
	CEASS6	0.8048	0.1683	0.47495	1.135	0.40064	4.782	<.001
	CEASS7	0.8029	0.165	0.47955	1.126	0.41126	4.867	<.001
	CEASS8	1.3356	0.2374	0.87032	1.801	0.52547	5.626	<.001
	CEASS9	1.2355	0.2138	0.81646	1.654	0.55534	5.779	<.001
	CEASS10	0.2865	0.1782	-0.06278	0.636	0.11343	1.608	0.108
Satisfaction	CS1	1	0	1	1	0.55217		
	CS2	0.1759	0.0946	-0.0095	0.361	0.11446	1.86	0.063
	CS3	0.1909	0.104	-0.01295	0.395	0.11296	1.835	0.066
	CS4	0.016	0.0985	-0.17697	0.209	0.00994	0.163	0.871
	CS5	0.1492	0.0996	-0.04596	0.344	0.09194	1.498	0.134
	CS6	0.507	0.1044	0.30235	0.712	0.31534	4.856	<.001
	CS7	0.9151	0.1236	0.67285	1.157	0.52967	7.404	<.001
	CS8	1.2032	0.135	0.93865	1.468	0.70009	8.913	<.001
	CS9	1.1601	0.1353	0.89488	1.425	0.65699	8.572	<.001
	CS10	0.3801	0.1053	0.17366	0.587	0.2277	3.609	<.001
Service Quality	SERQ1	1	0	1	1	0.52459		
	SERQ2	0.4411	0.1139	0.21798	0.664	0.25016	3.874	<.001
	SERQ3	0.7333	0.1314	0.47572	0.991	0.38276	5.579	<.001
	SERQ4	0.7182	0.1254	0.47238	0.964	0.39552	5.727	<.001
	SERQ5	0.8175	0.1293	0.56406	1.071	0.4499	6.321	<.001
	SERQ6	0.7846	0.1187	0.55186	1.017	0.47792	6.607	<.001
	SERQ7	1.1095	0.1392	0.83658	1.382	0.63557	7.968	<.001
	SERQ8	1.3332	0.1575	1.02452	1.642	0.70816	8.466	<.001
	SERQ9	0.9385	0.1314	0.68107	1.196	0.53473	7.145	<.001
	SERQ1 0	- 0.0713	0.1039	-0.275	0.132	- 0.04219	- 0.686	0.493

The results of the measurement model presented in Table 3 provide an assessment of the strength and significance of the observed indicators in measuring their respective latent constructs. This step is crucial for confirming the validity and reliability of the constructs before interpreting the structural model relationships.

For the latent construct Adoption of Digital Banking, ten observed indicators (CEASS1– CEASS10) were used. CEASS1 was set as the reference indicator with its loading fixed at 1, providing the scale for the latent variable. Among the remaining indicators, CEASS6 ($\beta = 0.4006$, $p < .001$), CEASS7 ($\beta = 0.4113$, $p < .001$), CEASS8 (β

= 0.5255, p < .001), and CEASS9 (β = 0.5553, p < .001) showed strong and statistically significant factor loadings. This indicates that these four items contribute most strongly to measuring the construct of digital banking adoption. CEASS2 and CEASS3 showed weaker but still statistically significant loadings (p < .05), suggesting they are acceptable but not as strong as indicators like CEASS8 or CEASS9. CEASS4 (p = 0.069) and CEASS10 (p = 0.108) were marginally non-significant, while CEASS5 (p = 0.856) did not significantly load on the latent construct. This pattern implies that while the overall construct is measured reasonably well, items such as CEASS5 and possibly CEASS4 or CEASS10 may not be strong indicators of adoption behavior and might require refinement or removal in future model iterations.

In the case of Satisfaction, CS1 was fixed as the reference indicator. The results reveal that CS6 (β = 0.3153, p < .001), CS7 (β = 0.5297, p < .001), CS8 (β = 0.7001, p < .001), CS9 (β = 0.6570, p < .001), and CS10 (β = 0.2277, p < .001) are highly significant and have moderate-to-strong factor loadings, indicating they are reliable indicators of the satisfaction construct. Conversely, CS2 (p = 0.063), CS3 (p = 0.066), and CS5 (p = 0.134) have weaker and statistically non- significant loadings, suggesting that they may not effectively represent the underlying latent variable. CS4 (p = 0.871) is clearly non-significant and may not contribute meaningfully to measuring satisfaction. Overall, the majority of items load well, with CS7, CS8, and CS9 being the most robust contributors, pointing to a solid measurement structure for the construct.

The construct Service Quality demonstrates the strongest measurement properties among the three latent variables. SERQ1 was the reference indicator, and almost all remaining indicators except SERQ10 showed high and statistically significant factor loadings. SERQ7 (β = 0.6356, p < .001) and SERQ8 (β = 0.7082, p < .001) had particularly strong loadings, indicating that they are highly representative of service quality perceptions. SERQ3, SERQ4, SERQ5, SERQ6, and SERQ9 also displayed robust and significant contributions. The only exception was SERQ10 (β = –0.0422, p = 0.493), which was statistically non-significant and even negatively related to the latent construct, suggesting that it does not align well with the overall dimension of service quality and might be dropped in future analyses to improve model fit.

Overall, the measurement model demonstrates satisfactory validity for the constructs of Adoption of Digital Banking, Satisfaction, and Service Quality, although certain indicators (CEASS5, CS4, and SERQ10 in particular) show weak or non-significant loadings and should be reconsidered. The significant loadings for most indicators, especially those with β values above 0.4, indicate that the latent variables are being reliably measured. This provides confidence in proceeding to interpret the structural model results, as the latent constructs are supported by adequate measurement validity.

Table 4 - Variances and Covariances

				95% Confidence Intervals				
Variable 1	Variable 2	Estimate	SE	Lower	Upper	β	z	p
CEASS1	CEASS1	1.085	0.1032	0.883	1.288	0.76	10.51	<.001
CEASS2	CEASS2	1.885	0.157	1.577	2.192	0.957	12	<.001
CEASS3	CEASS3	2.01	0.1663	1.684	2.336	0.971	12.09	<.001
CEASS4	CEASS4	1.703	0.1401	1.428	1.977	0.983	12.16	<.001
CEASS5	CEASS5	1.423	0.1162	1.195	1.65	1	12.25	<.001
CEASS6	CEASS6	1.158	0.1034	0.955	1.36	0.839	11.2	<.001
CEASS7	CEASS7	1.082	0.0972	0.892	1.273	0.831	11.13	<.001
CEASS8	CEASS8	1.599	0.1576	1.29	1.907	0.724	10.14	<.001

CEASS9	CEASS9	1.17	0.1197	0.935	1.405	0.692	9.78	<.001
CEASS10	CEASS10	2.153	0.1768	1.806	2.5	0.987	12.18	<.001
CS1	CS1	1.577	0.1367	1.309	1.845	0.695	11.54	<.001
CS2	CS2	1.612	0.1318	1.354	1.87	0.987	12.23	<.001
CS3	CS3	1.95	0.1595	1.638	2.263	0.987	12.23	<.001
CS4	CS4	1.801	0.147	1.513	2.089	1	12.25	<.001
CS5	CS5	1.805	0.1475	1.516	2.094	0.992	12.24	<.001
CS6	CS6	1.61	0.1332	1.349	1.871	0.901	12.08	<.001
CS7	CS7	1.485	0.1278	1.235	1.736	0.719	11.62	<.001
CS8	CS8	1.042	0.0996	0.846	1.237	0.51	10.46	<.001
CS9	CS9	1.226	0.1124	1.005	1.446	0.568	10.9	<.001
CS10	CS10	1.828	0.1502	1.533	2.122	0.948	12.17	<.001
SERQ1	SERQ1	1.525	0.1313	1.268	1.782	0.725	11.62	<.001
SERQ2	SERQ2	1.688	0.139	1.415	1.96	0.937	12.14	<.001
SERQ3	SERQ3	1.814	0.1516	1.517	2.111	0.853	11.97	<.001
SERQ4	SERQ4	1.61	0.1348	1.346	1.875	0.844	11.95	<.001
SERQ5	SERQ5	1.525	0.1289	1.272	1.778	0.798	11.83	<.001
SERQ6	SERQ6	1.204	0.1024	1.003	1.405	0.772	11.76	<.001
SERQ7	SERQ7	1.052	0.0949	0.866	1.238	0.596	11.08	<.001
SERQ8	SERQ8	1.023	0.0979	0.831	1.215	0.499	10.45	<.001
SERQ9	SERQ9	1.274	0.11	1.058	1.489	0.714	11.58	<.001
SERQ10	SERQ10	1.651	0.1349	1.387	1.916	0.998	12.24	<.001
Adoption of Digital Banking	Adoption of Digital Banking	0.342	0.0923	0.161	0.523	1	3.7	<.001
Satisfaction	Satisfaction	0.37	0.0927	0.188	0.552	0.535	3.99	<.001
Service Quality	Service Quality	0.322	0.081	0.163	0.48	0.555	3.97	<.001
Satisfaction	Service Quality	0.37	0.0708	0.231	0.508	1.071	5.22	<.001

The results presented in Table 4 summarize the variances of individual observed indicators, the variances of latent constructs, and the covariance between Satisfaction and Service Quality. Interpreting these results is essential for evaluating measurement reliability, construct distinctiveness, and the overall adequacy of the model. The variances of the observed indicators (CEASS1–CEASS10, CS1–CS10, SERQ1–SERQ10) were all statistically significant at $p < .001$, with z-values greater than 9.7 across the board. This indicates that there is substantial variability among respondents' scores on each observed item, and none of these variables are constant or redundant. The relatively high variance estimates for CEASS3 (2.01), CEASS10 (2.153), CS3 (1.95), and CS10 (1.828) suggest that these items captured a wider range of responses compared to others. Conversely, indicators such as CS8 (1.042) and SERQ8 (1.023) exhibited relatively lower variance, which may imply more uniform responses

or higher consensus among respondents on these specific aspects.

At the latent construct level, the variance estimates were also significant. The variance for Adoption of Digital Banking was 0.342 ($z = 3.70$, $p < .001$), suggesting moderate variability in the latent construct across the sample. Satisfaction showed a variance of 0.37 ($z = 3.99$, $p < .001$), indicating slightly higher variability in satisfaction levels among respondents. Service Quality reported a variance of 0.322 ($z = 3.97$, $p < .001$), pointing to comparable variability with adoption levels. These significant variances provide evidence that all three constructs are meaningfully dispersed and not fixed, allowing for meaningful structural relationships to be estimated.

Perhaps most importantly, the covariance between Satisfaction and Service Quality was 0.37 ($z = 5.22$, $p < .001$), indicating a strong and statistically significant positive association between these two latent constructs. This finding is theoretically consistent, as higher levels of perceived service quality are generally associated with higher satisfaction among customers. The standardized covariance value ($\beta = 1.071$) suggests that these constructs share a substantial amount of variance, reinforcing their interdependence. This relationship also provides conceptual justification for examining them jointly in the structural model, as improvements in service quality are likely to translate into greater satisfaction.

Overall, the results from the variances and covariances analysis support the adequacy of the measurement model by confirming that all observed variables demonstrate meaningful variability, the latent constructs are well-defined with significant dispersion, and the key theoretical relationship between satisfaction and service quality is strongly supported. This strengthens the validity of proceeding with structural model interpretation, as it confirms that the constructs are not only statistically significant but also conceptually related in ways that align with theoretical expectations.

Table 5 - Intercepts

			95% Confidence Intervals			
Variable	Intercept	SE	Lower	Upper	z	p
CEASS1	3.86	0.069	3.725	3.995	55.966	<.001
CEASS2	3.42	0.081	3.261	3.579	42.201	<.001
CEASS3	2.997	0.083	2.834	3.159	36.076	<.001
CEASS4	3.573	0.076	3.424	3.722	47.038	<.001
CEASS5	3.857	0.069	3.722	3.992	56.002	<.001
CEASS6	3.973	0.068	3.84	4.106	58.599	<.001
CEASS7	3.977	0.066	3.848	4.106	60.345	<.001
CEASS8	3.72	0.086	3.552	3.888	43.359	<.001
CEASS9	3.93	0.075	3.783	4.077	52.334	<.001
CEASS10	3.67	0.085	3.503	3.837	43.042	<.001
CS1	3.59	0.087	3.42	3.76	41.284	<.001
CS2	3.777	0.074	3.632	3.921	51.182	<.001
CS3	3.463	0.081	3.304	3.622	42.681	<.001
CS4	3.83	0.077	3.678	3.982	49.43	<.001
CS5	3.887	0.078	3.734	4.039	49.893	<.001
CS6	3.927	0.077	3.775	4.078	50.864	<.001

CS7	3.61	0.083	3.447	3.773	43.517	<.001
CS8	3.483	0.083	3.322	3.645	42.21	<.001
CS9	3.3	0.085	3.134	3.466	38.921	<.001
CS10	3.65	0.08	3.493	3.807	45.536	<.001
SERQ1	3.577	0.084	3.413	3.741	42.707	<.001
SERQ2	3.597	0.077	3.445	3.749	46.424	<.001
SERQ3	3.233	0.084	3.068	3.398	38.413	<.001
SERQ4	3.47	0.08	3.314	3.626	43.499	<.001
SERQ5	3.393	0.08	3.237	3.55	42.506	<.001
SERQ6	3.81	0.072	3.669	3.951	52.825	<.001
SERQ7	3.61	0.077	3.46	3.76	47.071	<.001
SERQ8	3.367	0.083	3.205	3.529	40.705	<.001
SERQ9	3.77	0.077	3.619	3.921	48.891	<.001
SERQ10	3.84	0.074	3.694	3.986	51.71	<.001
Adoption of Digital Banking	0	0	0	0		
Satisfaction	0	0	0	0		
Service Quality	0	0	0	0		

The analysis of Table 5, which reports the intercepts for all measurement items under the constructs CEASS (Customer Experience and Attitude towards Self-Service), CS (Customer Satisfaction), and SERQ (Service Quality), reveals several important insights about respondents' perceptions. All intercepts were found to be highly significant ($p < .001$), confirming that the mean responses for each item are statistically different from zero and demonstrate a generally positive attitude towards digital banking and its associated services.

For the CEASS construct, intercept values vary from 2.997 for CEASS3 to 3.977 for CEASS7. These results show that respondents have generally a favourable attitude towards self service options with particularly high levels of agreement on CEASS6 and CEASS7 which both have the highest mean scores, of around 3.97. This means that customers are very positively exposed to these facets of customer experience. Conversely, CEASS3 is on a comparatively neutral position with its mean stand, around 3.0, which implies that there remains an aspect of improvement in as far as this aspect of the self-service experience.

The Customer Satisfaction (CS) construct has also a consistent of positive result with the intercept of 3.3 of CS9 to 3.927 of CS6. Most of the satisfaction indicators are beyond the middle of the scale that signifies that the customers are usually satisfied with the services offered. The products that have been scored most, that is, CS6, CS5 and CS4, indicate that the respondents were very satisfied with these areas, and this could be one of the strengths of the service delivery process. Conversely, the lowest means of the items of satisfaction should receive more scrutiny by CS9 due to the possibility of the service lacking any service gaps or pain points influencing the customer experience.

Similarly, the Service Quality (SERQ) construct shows intercepts between 3.233 for SERQ3 and

3.84 for SERQ10, again reflecting a generally favorable evaluation of service quality. Items such as SERQ6 and SERQ10 achieve the highest means, indicating strong agreement from respondents regarding the quality

dimensions captured by these measures. Nonetheless, relatively lower scores for SERQ3 and SERQ8 suggest that some aspects of service quality might still benefit from targeted improvements to further enhance overall customer experience.

The latent variables Adoption of Digital Banking, Satisfaction, and Service Quality are set to zero in the model for identification purposes and therefore do not have interpretable intercepts.

In conclusion, the intercept values collectively illustrate that respondents perceive digital banking adoption, satisfaction, and service quality in a strongly positive light. Most items score well above the scale's midpoint, reinforcing the notion that customers appreciate the digital services provided. However, the relatively lower intercepts observed in CEASS3, CS9, SERQ3, and SERQ8 serve as useful indicators for management to focus their attention on improving specific areas of self- service design, customer engagement, and service delivery to further enhance customer satisfaction and loyalty.

6 Discussion and Conclusion of the Study:

The primary objective of this study was to examine "the impact of the adoption of digital banking services on customer satisfaction and perceived service quality. The study aimed to investigate how the adoption of digital platforms influenced the way customers perceived reliability, security, responsiveness, and overall ease of use, and how these perceptions translated into satisfaction levels. By exploring these relationships, the study sought to provide insights into how banks could strengthen their digital transformation efforts to enhance customer experience and retention".

The adoption of digital banking services has a significant positive effect on customer satisfaction is demonstrated in the present study. Those participants who actively participated in digital platforms expressed high levels of satisfaction - and attributed this to the convenience, speed and accessibility that the services provided. This finding supports the existing studies by Kaur et al., (2021) who emphasised reliability as a key factor affecting customer satisfaction and assumed that banks that provide error-free and consistent service may have a higher retention rate. Likewise, the results also confirmed that service quality is instrumental in shaping satisfaction and as such supports the conclusions of Jaiwani et al. (2022), whose research identified reliability, security, and ease of use as principal drivers of satisfaction and loyalty.

A further salient finding is related to the positive relation between digital banking adoption and perceived service quality. Users that adopted digital platforms perceived the services as more reliable and user-friendly. This observation is consistent with previous studies such as Uribe-Linares et al. (2023), which showed that digital transformation boosts customer experience (greater convenience, faster transactions, and increased engagement possibilities). The study also further confirms the pivotal role of security and trust as the integral part of service quality, which is in line with Gill et al. (2021) who reported that data protection and trustworthiness have a significant influence on loyalty intentions.

Moreover, the results highlight the importance of customization and responsiveness in the digital banking setting. Customers placed value on prompt, personalised services and recommendations, thus reinforcing the conclusions of Duc (2022), for whom personalization and proactive problem-solving have been identified as major contributors to satisfaction and loyalty. The results are also similar to the research conducted by Mbama et al. (2018) that argued that usability and brand trust are an important antecedent that will motivate digital transformation to improved financial performance and customer retention.

When put in perspective of the overall literature, this exploration contributes the prevailing view that digital banking adoption is a core attribute of customer experience of banking in the twenty-first century as opposed to a marginal service. The results have augmented the results of Abuhasan and Moreb (2021), who discovered that cost barriers and fear of privacy are two possible barriers to adoption which has further reinforced the necessity of customer education and effective cybersecurity to establish trust. The fact that this study challenges based on secure, reliable and user-friendly platforms can be described as such because of their recommendation on banks

to overcome those problems through customer-centric approaches.

Conclusion of the Study

The study based on the results considered that the utilisation of digital banking services is central to increasing customer satisfaction and perceived service quality. Those customers that did the transactions through the digital channels felt that the banking services were more convenient, reliable and secure and consequently increased their satisfaction rate. Also, service quality dimensions, including reliability, security and responsiveness became significant predictors of satisfaction thereby supporting the notion that digital banking should not simply be about the utilisation of technology, but about quality delivery of the service.

The research was firm that a priority of the banks should be to invest in secure systems and non-complex systems and concentrate on cutting down error of service and creation of personalised experience as a way of satisfying the customer expectations. This way, they will be in a position to enhance not only the level of satisfaction, but loyalty and long-term engagement as well. The results mean that the previous studies conducted by Kaur et al. (2021), Jaiwani et al. (2022) and Uribe-Linares et al. (2023) highlight the interdependence between digital adoption and satisfaction and customer retention.

In summary, the study highlights the fact that digital transformation in banking represents a strategic imperative that has a significant influence on customer perceptions and behaviours. Banks invested in improving digital service quality, keeping services secure, and providing seamless user experiences will be better equipped to retain customers, establish trust, and continue to lead in the changing financial environment.

7 Study Implications

“The results of this study had important implications for theory, practise, and policy, and they provided valuable contributions to the study of the digital banking adoption process and its impact on customer satisfaction and service quality. Theoretically, this study contributed to the existing knowledge by empirically proving that digital banking adoption had a positive impact on both satisfaction and service quality perceptions in line with prior studies that emphasised the role of technology adoption in customer experience improvement (Davis, 1989; Parasuraman et al., 2005). Practically, the results suggest that banks and financial institutions should focus on investments in secure, user-friendlier and reliable digital platforms to improve the customer experience and engagement and in turn improve the quality outcomes of their services.” This implies that digital solutions do not just become tools of transaction and but processes that give rise to high customer perception to buy and remain loyal and eventually translate to organisational performance. The study will have impact on the policymakers and regulators by demonstrating how a facilitating environment would facilitate digital transformations through regulations, developing infrastructure and informing the customers, in particular, in the cases where digital literacy acts as a restrictor. Lastly, the research study gives future researchers the opportunity of exploring other variables of trust, perceived risk and demographic variables as the potential mediators or moderators of the relationship to have more understanding of customer behaviour in the case of digital banking. Overall, the study implications are that to remain competitive in an ever growing technology-based financial world, there is the need to remain ever digitally innovative and customer-driven.

8 Future Scope of the Study

The current research sets out several future research directions as it points out the fluidity of the digital banking adoption and its impact on the service quality and customer satisfaction. Future empirical investigation should also consider the effect of nascent technologies that were chosen that, artificial intelligence, blockchain, and open banking platforms on consumer views and trust in digital financial services. Researchers may also examine demographic variations, such as age, gender, income level, and digital literacy, to identify segment-specific

strategies for enhancing adoption and satisfaction. Longitudinal studies could provide insights into how customer perceptions and satisfaction levels change over time as digital banking matures and as new features are introduced. Additionally, future research could investigate potential mediating or moderating factors, including trust, perceived risk, cybersecurity concerns, and personalization of services, to build a more holistic understanding of customer experience. Comparative studies across regions or countries could further enrich the literature by examining cultural, infrastructural, and regulatory differences that affect digital banking adoption. Such future work would deepen theoretical understanding and offer actionable insights for banks seeking to optimize their digital transformation strategies.

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