# THE IMPACT OF DIGITAL BANKING SERVICES ON CUSTOMER SATISFACTION: EVIDENCE FROM JOINT STOCK COMMERCIAL BANK FOR INVESTMENT AND DEVELOPMENT OF VIETNAM (BIDV), THUA THIEN HUE BRANCH

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## **ABSTRACT**

This study emphasizes the critical need for BIDV Thua Thien Hue Branch to prioritize customer satisfaction by continually enhancing the quality of its digital banking services. In a demanding economic environment, focusing on customer satisfaction is essential for attracting and retaining customers. The research employed a mixed-methods approach, integrating both qualitative and quantitative data collection techniques. In-depth interviews were conducted with banking experts in Hue City, including researchers, managers, entrepreneurs, and customers of BIDV Thua Thien Hue Branch. The study aimed to gather comprehensive insights into the current state of digital banking services, customer perceptions, and expert opinions. The findings reveal that independent variables have a significant positive influence on customer satisfaction, explaining 64.2% of the variability observed. These results underscore the pivotal role of these variables in enhancing the quality of digital banking services offered by BIDV Thua Thien Hue Branch. This study provides valuable insights for managers and experts in banking and information technology, deepening their understanding of digital banking services and guiding future developments in this rapidly evolving field.

Keywords: BIDV, Customer Satisfaction, Digital Banking.

#### 1. INTRODUCTION

The contemporary global landscape is undergoing a profound metamorphosis, characterized by the advent of the Fourth Industrial Revolution, also reffered to as Industry 4.0 (Manesh, Pellegrini, Marzi, & Dabic, 2020). This revolution transcends mere technological progress; it signifies a convergence of the physical and digital realms, blurring the lines that once separated them. Industry 4.0 is acting as a catalyst for a paradigm shift across diverse sectors, revolutionizing production processes, management practices, and the very nature of human-technology interaction.

The proliferation of smart connectivity, facilitated by the Internet of Things (IoT) and the Internet of Services (IoS), has unlocked unprecedented opportunities for innovation and economic growth (Ande, Adebisi, Hammoudeh, & Saleem, 2020; Xu et al., 2020). The transformative impact of this revolution extends far beyond the manufacturing sector; it is permeating a wide array of domains, including healthcare, education, and financial services, fundamentally reshaping their operational landscapes.

In the financial sector, information technology has emerged as a cornerstone, underpinning the implementation of a multitude of modern banking services. The convergence of artificial intelligence, big data analytics, and blockchain technology has heralded a new era of possibilities. Financial transactions have become exponentially faster and more flexible, ranging from the seamless opening of online accounts to the convenient management of personal finances through mobile applications.

Concurrently, information security has assumed paramount importance. Robust measures are being implemented to safeguard sensitive personal and financial data, mitigating the risks of loss and fraud in an increasingly digital world. Modern banks are evolving beyond their traditional role as mere facilitators of currency transactions. They are assuming the mantle of strategic partners, assisting individuals and businesses in their financial management endeavors, and thereby becoming integral components of the broader socioeconomic fabric.

Commercial banks in Vietnam are keenly focused on modernization and innovation in the banking sector, particularly in the face of intensifying competition. To maintain pace with their more advanced counterparts, they are continuously striving to provide new banking conveniences and enhance operational efficiency. In the current economic climate, offering cutting-edge banking services is paramount to attracting and retaining customers.



Vietnamese banks have established clear objectives for developing and implementing new technological solutions. Ranging from payment systems to smart mobile applications, they are investing in technology platforms to create entirely new digital banking experiences for their clientele. Modernizing banking and payment systems allows them to respond rapidly to the complexities of today's business environment. Simultaneously, improving operational efficiency is a top priority. Commercial banks in Vietnam are focusing on streamlining internal processes, optimizing costs, and enhancing their ability to respond swiftly to changing market conditions. This enables them to maintain flexibility and adaptability in the face of new challenges while providing diverse and effective banking services to their customers.

Digital banking has emerged as a significant driving force, bringing substantial benefits to customers, banks, and the economy. The convenience, speed, and accuracy of digital transactions are major advantages for customers. There is no longer a need to visit a physical bank branch; everything from opening an account to transferring money can be done online. Customers can track and manage their finances anytime, anywhere, through mobile apps or the bank's website, providing significant flexibility and control. For banks, transitioning to a digital banking model helps them optimize processes, reduce costs, and enhance service capabilities. They can offer 24/7 services without time or location constraints, strengthening customer relationships and attracting new users. The economy also benefits from the widespread adoption of digital banking, improving the efficiency and effectiveness of resource utilization. The accuracy in transactions and financial management contributes to the stability and development of the global financial system.

In the context of an increasingly competitive and open economy, establishing a clear position and implementing effective strategies are crucial steps for the Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV) - Thua Thien Hue Branch to ensure its continued survival and growth. Particularly in the banking sector, enhancing the quality of modern digital banking services plays a decisive role in attracting and retaining customers. To define its unique position, BIDV Thua Thien Hue Branch needs to clearly articulate its goals and formulate strategies that align with the local market conditions. This will allow them to focus on providing services and products that meet the specific needs of customers in the region. A robust local strategy can help BIDV, in general, capture market share, enhance trust, and create a competitive advantage.

Meanwhile, improving the quality of digital banking services is essential for attracting customers, especially the younger generation. BIDV Thua Thien Hue Branch needs to invest in technology and systems to provide a convenient, fast, and secure digital banking experience. Developing mobile applications, interactive websites, and online services will enable them to reach customers in a flexible and efficient manner.

The importance of conducting research on the impact of digital banking services on customer satisfaction, particularly for commercial banks like BIDV Thua Thien Hue Brach, is undeniable. As customers increasingly prefer digital banking solutions, a thorough understanding on their experiences or viewpoints is critical for commercial banks seeking competitiveness. Concentrating on customer satisfaction, this paper can reveal key areas for digital banking service enhancement which directly impact customer loyalty and retention. It aims to provide practical implications that BIDV Thua Thien Hue Brach, in particular, and BIDV, in general, can tailor its digital banking offerings to meet local needs while maintaining aligned with national banking trends.

The following section features an original conceptual framework and fomulates the hypothese of this empirical investigation. Next, the methodology gives details on the data collection process for this quantitative study. Subsequently, the result discussions present the findings in accordance with research model. To sum up, the paper identifies theoretical and managerial implications. It also discusses about the limitations of this study and outline future research avenues.

## 2. LITERATURE REVIEW

Customer satisfaction in digital banking services has attracted significant attention from researchers, particularly as digital platforms increasingly dominate the financial services sector. Numerous studies have searched to identify key determinants of customer satisfaction in accordance with service quality dimensions such as reliability, responsiveness, service capacity, empathy, and tangibility.

Ankit (2011) was one of the early contributors to this field, investigating customer satisfaction with online banking services in India. Utilizing data from 250 users, Ankit employed quality analysis methods such as reliability testing



(Cronbach's Alpha), exploratory factor analysis, and linear regression to identify ten key factors influencing customer satisfaction within the online banking context. These factors encompass the need for the service, core banking services, convenience, risk management and privacy considerations, continued use intentions, problem-solving capabilities, cost-effectiveness, interest rates, fees, and overall availability. The findings offer a comprehensive understanding of how technical and relational aspects of service influence customer satisfaction in digital banking environments.

Building on Ankit's work, Kumar et al. (2013) conducted a similar study in Bangalore, India, surveying 250 online banking customers and employing analogous quality analysis methods. Their findings also highlighted the influence of ten factors on customer satisfaction levels, including the need to use the service, core banking services, convenience, risk management and privacy, continued use intentions, problem-solving capabilities, cost-effectiveness, interest rates, fees, and availability. It can be said that a mix of functional and experiential factors are central to customer satisfaction. Both studies underscore the relevance of service reliability and responsiveness in shaping positive user experiences.

Expanding this concern geographically, Jazani et al. (2014) sought to identify the factors contributing to customer satisfaction with digital banking services in Tehran, Iran, using data from 708 customers. The research applied a linear structural model to analyze the collected data. Unlike the earlier Indian studies, the authors revealed five significant factors impacting customer satisfaction including efficiency, usability, website quality, security, and bank image. These findings could be considered as the dimension of tangibility, particularly interface and security features of digital banking platforms. The shift in focus from traditional service components to more digitally specific aspects like usability highlights the evolving nature of customer expectations in digital banking.

Similarly, Kapoor (2015) concentrated on analyzing customer satisfaction with online banking services within the Tricity area. Data was collected from 480 online banking customers, and an average score calculation method was employed. The study identified five factors significantly influencing customer satisfaction: support facilities, reliability, responsiveness, assurance, and empathy. These findings shed light on the crucial elements shaping user experience and customer satisfaction with online banking services in the Tricity region.

In Vietnam, several studies have focused on similar determinants of customer satisfaction in digital banking services. Nga (2012) investigated factors influencing the adoption of digital banking services at Agribank Bien Hoa, Vietnam. The study surveyed 250 digital banking users at this branch. Findings revealed six primary factors affecting customer satisfaction: transaction processes, reliability, technology systems, products and services, customer psychology, and accessibility. This study's inclusion of psychological factor suggested that in addition to the service process, customer perceptions also play a crucial role in shaping satisfaction. This related to earlier works, such as Ankit's (2011), by emphasizing the importance of both technical (reliability, technology) and relational (customer psychology) factors.

Thuan (2012) analyzed factors influencing individual customer satisfaction with digital banking services at Vietinbank Da Nang. As a result, service capacity, responsiveness, pricing perception, understanding, reliability, and physical facilities emerged as main factors. The service quality, as a key determinant of satisfaction, provides a viewpoint on how well a bank can meet customer needs promptly and effectively. This study also aligns with the conclusions drawn by Kapoor (2015), who emphasized responsiveness as an essential element, thus connecting both studies through their focus on service performance in forming customer perception.

Thang & Long (2013) further contributed to this concern by examining how digital banking service quality affects customer satisfaction and loyalty in Vietnam. Using data collected from 511 digital banking customers across major cities and employing structural equation modeling (SEM), they demonstrated that the overall quality of digital banking services, particularly information systems and banking service products, directly impacts both customer satisfaction and loyalty. This leads to a long-term perspective, where satisfaction not only depends on the immediate service experience but also influences customer retention, loyalty, and continued use of digital banking services. These results closely relate to Ankit's (2011) and Kumar et al.'s studies.

Hai (2017) shifted focus to service quality at the Vietinbank Da Nang Brach, surveying 160 customers. Employing Cronbach's Alpha analysis, factor discovery, and linear regression, the study found empathy, tangibility, and responsiveness to be the most significant variables impacting customer satisfaction. These results support the importance of the service quality factors established in previous studies, particularly empathy and responsiveness, and align with the current research.



Dat (2020) and Chi (2022) also examined digital banking satisfaction at BIDV, with Chi emphasizing customer acceptance behavior and Dat identifying employee service capacity, convenience, equipment modernity, and transaction process efficiency as key factors. Both studies reinforce the importance of service capacity and tangibility, the physical and technological resources that banks provide to ensure efficient service delivery, while also pointing to evolving customer expectations in Vietnam's increasingly digital banking environment.

In short, existing studies across different geographic regions focusing on key factors that impact customer satisfaction in digital banking services. The variables of reliability, responsiveness, service capacity, empathy, and tangibility consistently appear as main issue in shaping customer experiences. The present study aims to build upon these foundations by examining these factors specially within the context of a Vietnamese commercial bank, contributing to a deeper understanding of customer satisfaction in digital banking services.

#### 3. METHODOLOGY

The research employed a mixed-methods approach, incorporating both qualitative and quantitative data collection techniques. In-depth interviews were conducted with banking experts in Hue City, Vietnam encompassing researchers, managers, and entrepreneurs within the banking sector, as well as customers utilizing digital banking services at The Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV) - Thua Thien Hue Branch. This multifaceted approach aimed to gather comprehensive insights into the current state of digital banking services, customer perceptions, and expert opinions on the subject. The research design involved the collection and analysis of both primary and secondary data sources. Primary data was collected through the interviews, while secondary data was sourced from relevant literature, industry reports, and BIDV's internal documents. The integration of these diverse data sources facilitates a holistic understanding of the research phenomenon. Statistical methods were employed to rigorously analyze the collected data. Real-world data collection standardized statistical processing, and the utilization of specialized data analysis software ensured the accuracy and reliability of the research findings.

To ensure the representativeness of the survey sample, a probability sampling method was adopted. Consequently, the following formula (Yamane Taro, 1967) was utilized to determine the minimum sample size in the study:

$$n = \frac{Z^2 \cdot p \cdot q}{\varepsilon^2}$$

This formula enables the calculation of a sample size that is statistically sound and capable of yielding meaningful insights, thus contributing to the overall robustness of the research. Where:

n: Sample size (individuals)

Z: 1.96 (corresponding to a 95% confidence level)

p: Proportion of agreement

q: (q = 1 - p) Proportion of disagreement

 $\epsilon$ : sampling error allowed with  $\epsilon = \pm 0.05$  (5%)

The proportions p and q are determined as follows: The authors conducted a direct pilot survey with one hundred randomly selected customers and processed the data using SPSS to determine p and q. The survey used a 5-point scale, which was then transformed into a 2-point scale (combining "completely disagree" and "disagree" into "disagree," and considering responses from "normal" to higher as "agree"). Based on preliminary investigation, the author found p = 0.7 and q = 0.3. Substituting the given values (Z = 1.96,  $\varepsilon = 0.05$ , p = 0.7, and q = 0.3) into the formula, the study determined a minimum sample size of 323 observations.

The quantitative research methodology encompassed the following systematic steps:



#### (i) Survey Questionnaire Design

The survey questionnaire was meticulously crafted based on the theoretical framework of customer satisfaction with service quality. It incorporated five key criteria: Reliability, Responsiveness, Service Capacity, Empathy, and Tangible resources.

A 5-point Likert scale was employed to measure the level of customer agreement for each survey item. To ensure clarity, simplicity, and ease of response, the questionnaire underwent pilot testing with 50 customers, followed by necessary adjustments.

#### (ii) Survey Administration

Drawing upon prior research experience in the banking domain, 400 survey questionnaires were directly administered to individual customers utilizing digital banking services at The Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV) - Thua Thien Hue Branch during August and September 2023.

## (iii) Data Aggregation and Cleaning

Upon completion of the survey, responses were meticulously aggregated. Invalid responses were identified and removed, ensuring the integrity of the dataset for subsequent analysis. The remaining valid responses constituted the primary data for the research.

#### (iv) Data Analysis and Processing

The dataset was subjected to the following analytical procedures:

Cronbach's Alpha Test: This test was employed to assess the reliability of the observed variables within the measurement scale. It evaluated the internal consistency of the data by examining the reliability within the model, utilizing both Cronbach's Alpha coefficient and the total variable correlation coefficient. Following the guidelines of Hair, J.F.J., Anderson, R.E., Tatham, R.L., & Black, W. (1998), a Cronbach's Alpha coefficient between 0.6 and 0.7 was considered acceptable. In the socioeconomic context of this research, an approximate value of 0.8 signified good reliability. Values exceeding 0.9 suggested potential redundancy among variables due to strong linear relationships, prompting consideration for variable removal. Variable selection prioritized those with a Cronbach's Alpha coefficient greater than 0.7. Variables exhibiting a total variable correlation coefficient less than 0.3 were excluded from the model (Nunnally & Bernstein, 1994).

Exploratory Factor Analysis (EFA): This method was applied to reduce the dimensionality of the observed variables, aiming to create more meaningful groupings while preserving most of the information inherent in the original variables. EFA served as an exploratory technique to ascertain the scope and strength of relationships between observed variables and underlying factors. It provided the basis for constructing a set of measures to reduce the number of observed variables and integrate them into fundamental factors. Furthermore, EFA enabled the identification of convergence values and discriminant validity among variable groups. According to Hair, J.F.J., Anderson, R.E., Tatham, R.L. & Black, W. (1998), the correlation coefficient between variables was required to be  $\geq 0.5$ . Additionally, the difference between factors was expected to be  $\geq 0.3$ , as suggested by Jabnoun & Hassan Al-Tamimi (2003). Factors with Eigenvalues < 1 were excluded from the model (Kaiser, 1960). The total variance extracted was required to exceed 50%. The Kaiser-Meyer-Olkin (KMO) measure was expected to fall within the range of 0.5 < KMO < 1 to ensure the appropriateness of EFA analysis.

*Bartlett's Test:* This test was employed to examine the correlation between observed variables within the population. A statistical significance (Sig.) value of < 0.05 indicated the presence of correlation among the observed variables (Hair et al., 2006).



*OLS Regression Analysis:* The quality of digital banking services at BIDV - Thua Thien Hue Branch was evaluated by examining the relationship between digital banking service quality and customer satisfaction using Ordinary Least Squares (OLS) regression analysis.

## RESULTS AND DISCUSSION

The research collected 385 valid survey responses out of 400 distributed questionnaires to be used as data for the research, after eliminating inappropriate observations through screening questions and errors in filling out the questionnaire.

**Table 1. Data Description** 

Group		Number of observations	Ratio (%)
Gender	Men	160	41,56
	Women	225	58,44
Age	From 18 to 20	95	24,68
	From 20 to 30	237	61,56
	From 30 to 40	28	7,27
	Over 40	25	6,49
Occupation	Business	91	23,64
	Government officers	190	49,35
	Student	18	4,68
	Labor	41	10,65
	Housewife, retirement	45	11,69
Individual income	Under 2 million	45	11,69
	From 2-5 million	127	32,99
	From 5-10 million	182	47,27
	Over 10 million	31	8,05
<b>Total observations</b>		385	·

(Source: A collection and analysis of authors)

The SERVPERF model is employed to evaluate the key determinants of digital banking services that impact customer satisfaction at the BIDV Thua Thien Hue Branch.

The model is based on the following hypotheses:

- H1: Tangible Resources (HH) positively correlate with Customer Satisfaction (SHL).
- H2: Service Capability (NL) positively correlate with Customer Satisfaction (SHL).
- H3: Responsiveness (DU) positively correlate with Customer Satisfaction (SHL).
- H4: Empathy (DC) positively correlate with Customer Satisfaction (SHL).
- H5: Reliability (TC) positively correlate with Customer Satisfaction (SHL).

The research model established as follows:

$$SHL = Constant + \beta_1 HH + \beta_2 NL + \beta_3 DU + \beta_4 DC + \beta_5 TC + \varepsilon$$

Reliability Assessment Using Cronbach's Alpha:

Cronbach's Alpha serves as a critical measure for assessing the reliability of a measurement scale. It evaluates a set of observed variables associated with an underlying latent factor, aiming to identify variables that are both suitable and reflective of the factor's characteristics. The following conditions guide the selection of Cronbach's Alpha:

- Cronbach Alpha ≥ 0.6: A minimum threshold ensures acceptable internal consistency.
- Corrected Item-Total Correlation ≥ 0.3: The total variable correlation coefficient should exceed this value to maintain robustness.



Notably, all observed variables within the six factor groups meet these criteria, affirming their reliability and suitability for subsequent exploratory factor analysis (EFA).

## Exploratory Factor Analysis (EFA):

EFA plays a pivotal role in uncovering relationships among research data variables. By grouping observed variables with shared characteristics into latent factors, EFA ensures both discriminant validity and convergence for measurement scales. Key conditions for selecting EFA include:

- Kaiser Meyer Olkin (KMO) Score: A value between 0.5 and 1 indicates suitability for factor analysis based on the dataset.
- Bartlett's Test of Correlation: A significance level (Sig) below 0.05 confirms linear correlation between observed variables and the latent factor.
- Explained Variance: Eigenvalues greater than 1 and cumulative variance exceeding 50% demonstrate the proportion of variance explained by the observed variables.

Table 2. The estimated results

	<b>Unstandardized Coefficients</b>		Standardized Coefficients			
	В	Std. Error	В	t	Sig.	VIF
(Constant)	-0,089	0,369		-0,243	0,809	
HH	0,521	0,046	0,663	11,279	0,000	1,149
DU	0,091	0,053	0,097	1,719	0,088	1,051
NL	0,143	0,048	0,167	2,970	0,004	1,046
TC	0,079	0,038	0,120	2,049	0,043	1,139
DC	0,235	0,073	0,181	3,224	0,002	1,053

ANNOVA

F 43,665 Sig. .000

Durbin –Watson 1,941 Adjusted R<sup>2</sup> 0,642

(Source: An analysis of author)

Linear regression analysis serves as a powerful tool for understanding the direction and magnitude of the impact exerted by independent variables on a dependent variable. In our study, we employ the "Enter" method during the regression phase, adhering to the criterion that significance levels (Sig.) should be less than 0.05. Variables failing to meet this threshold are systematically excluded from the model.

As shown in Table 2, the Sig. values associated with our independent variables—namely, Tangible Resources (HH), Service Capability (NL), Reliability (TC), and Empathy (DC)—all exhibit statistical significance within the model, as each value is less than 0.05. However, the Responsiveness (DU) variable does not meet the significance threshold, with a Sig. value of 0.088 (> 0.05), leading to its exclusion from the proposed model. The research model comprises four influential factors: "Tangible Resources," "Service Capability," "Reliability," and "Empathy." These factors collectively shape the quality of digital banking services (DVNH) provided by BIDV Thua Thien Hue.

SHL = 0,663 HH + 0,167 NL + 0,120 TC + 0,181 DC +  $\varepsilon$ 

Let us delve into the interpretation of the coefficients:

- Tangible Resources ( $\beta 1 = 0.663$ ): A one-unit change in "Tangible Resources" corresponds to a 0.663-unit increase in overall "Satisfaction," assuming all other variables remain constant.
- Service Capability ( $\beta$ 3 = 0.167): Similarly, a one-unit change in "Service Capability" leads to a 0.167-unit increase in "Satisfaction."



Reliability ( $\beta 4 = 0.120$ ) and Empathy ( $\beta 5 = 0.181$ ): These coefficients represent the effects of "Reliability" and "Empathy," respectively.

Both independent variables positively influence "Satisfaction," emphasizing their pivotal role in enhancing the quality of digital banking services offered by BIDV Thua Thien Hue.

Furthermore, our ANOVA variance analysis results (as presented in Table 2) reveal an F-statistic of 43.665, accompanied by a significance level (Sig.) of 0.000 (< 0.05). This robustly confirms that our model aligns well with the dataset, demonstrating a linear correlation between independent variables and the dependent variable. Importantly, the Durbin–Watson statistic falls within the acceptable range (1 to 3), indicating the absence of autocorrelation.

Lastly, the adjusted R-squared (Adjusted R Square) value of 0.642 signifies that the independent variables (DC, DU, NL, TC, HH) collectively account for 64.2% of the variability observed in the "Satisfaction" variable. Although 35.8% of the variation remains unexplained, leaving room for further investigation into other potential determinants.

Shortly, this research identifies four key determinants that significantly influence the customer satisfaction on digital banking services at BIDV, Thua Thien Hue Branch. The results could provide actionable insights for bank managers, emphasizing the need to focus on enhancing these aspects of service to improve overall customer perception. While the responsiveness factor was not statistically significant in this study, future research could explore its potential indirect effects or its influence in different contexts.

## **CONCLUSION**

Based on the application of rigorous scientific research methodologies, this study has successfully achieved its stated research objectives, particularly focusing on customer satisfaction within the scope of digital banking services. Firstly, it elucidates the concept of digital banking services, offering a detailed analysis of the advantages these services present, and underscoring the imperative need for the development of digital banking at BIDV Thua Thien Hue Branch within the context of Vietnam's financial market, which is increasingly intertwined with advanced financial technologies emerging from the Fourth Industrial Revolution. The study subsequently undertakes a comprehensive evaluation of the quality of digital banking services at BIDV Thua Thien Hue, identifying both the favorable conditions conducive to their growth and the challenges that hinder their progress. In doing so, it not only highlights the branch's successes but also critically examines its limitations, thereby providing strategic directions and actionable solutions for the enhancement and refinement of digital banking services. By highlighting key areas for enhancement, the study offers practical implications for improving service quality to meet local customer needs.

Moreover, informed by the IT and payment service development roadmap set forth by the State Bank of Vietnam and BIDV until 2025, the study puts forward a series of recommendations aimed at accelerating the digital banking development process at BIDV Thua Thien Hue Branch. The successful implementation of these digital banking strategies is contingent upon a synergistic collaboration between the government, the State Bank of Vietnam, relevant regulatory authorities, and the concerted efforts of BIDV Thua Thien Hue.

While this research thoroughly explores both the theoretical and practical dimensions of digital banking and offers pertinent solutions for its development, it is focused on the digital banking services of BIDV. Consequently, the exploration of related issues in the broader context will necessitate further scientific inquiry. Despite the inherent limitations arising from the novel and complex nature of the research topic, this study contributes significant insights for managers and experts in the banking and information technology sectors, enhancing their understanding of digital banking services and informing future development prospects in this rapidly evolving field.

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