

BANKING CUSTOMER BEHAVIOR AND BANKING SECTOR PERFORMANCE: THE ROLE OF THE DIGITAL INFRASTRUCTURE

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Abstract: Banks are a fundamental component of the financial system, as they are essential to economic growth. However, the significance of the banking sector in economic development is contingent upon the bank's performance and the client services it provides. In addition, the banking industry is transitioning from traditional to digital banking, where bank management is attempting to offer creative and distinctive services to improve performance. Prior study has been restricted to the individual and technological elements that influence the performance of banks, particularly digital financial institutions. In addition, no research investigates the impact of individual and behavioral characteristics on the performance of Saudi Arabian banks. This study's objective is to analyze the impact of perceived utility, perceived security, simplicity of use, banks' digital skills, and digital banking innovation on the performance of digital banks. Customers and workers using the bank's digital and employee services were sampled using a convenience sampling method. SPSS version 22 was used to analyze the data, and the regression analysis demonstrated that perceived utility, perceived security, ease of use, bank's digital skills, and digital banking innovation positively influence the performance of digital banks. Digital banking innovation and the bank's digital competencies impact bank performance among all criteria. This study's findings will assist banking professionals, policymakers, and researchers in better comprehending the roles of these components.

Keywords: Banks performance, digital banking innovation, Perceived security, Technology Adoption

Introduction

The financial services provided by the banking industry contribute significantly to the expansion of the private and public sectors. Increasing competition and globalization have prompted the banking industry to provide consumers with various options beyond basic accounts and debit and credit card services. This is intended to improve banking performance and enable banks to play their part in economic activity more effectively. According to Abu-Alkheil et al. (2012), a robust and efficient banking industry significantly contribute to economic growth. However, banks frequently struggle to comprehend the needs and demands of their customers based on their circumstances and actions. Kitsios et al. (2021) suggested that digitization has altered the character of financial services, with individuals preferring to utilize computers and smartphones to access banking services.

Technological improvements make it more challenging to comprehend the services, ways of delivering those services, and customer attitudes about new technology (Zainab et al., 2017) support of this, Chai et al. (2016) noted that the traditional banking sector has turned a significant portion of its services into online banking, where banks have been employing creative approaches to provide services to clients. In addition, banks have acknowledged that strengthening technology capabilities and advancing technological levels are crucial for achieving operational success and satisfying

consumer expectations. For this reason, banks have been attempting to use cutting-edge technologies to gain a deeper understanding of client behavior and preferences (Sangeetha & Mahalingam, 2011). These enhancements and procedures have aided the banking sector in enhancing its services and meeting the expanding demand for banking products and services, which are essential for economic expansion.

Several earlier research has examined the effect of behavioral and technological factors on digital banking adoption. Still, there have been fewer studies on the effect of behavioral and technology factors on banking performance. To the best of the researcher's knowledge, no study has explored the effect of digital banking innovation and banks' digital skills in increasing bank performance. Therefore, this study aims to identify the technological and behavioral customer elements that may impact banking performance. This study's objective is to evaluate the influence of security, perceived usefulness, perceived ease of use, digital banking innovation, and the bank's digital competencies in Saudi Arabia.

Literature Review

Digital banking has become essential for banks to play a part in economic development, remain competitive in the market, and improve their performance. However, numerous aspects influence bank performance, including convenience, self-efficacy, knowledge, trust, and the digital system.

Although there are a few studies (Carlson et al., 2001; Delgado et al., 2006; Sathye, 2005) on digital banking that do not affect bank performance, the majority of the research indicates a positive correlation between digital banking and bank performance (Hasan et al., 2002; Malhotra & Singh, 2009). Numerous studies in the past have explored crucial bank performance elements. The following part will discuss the relationships between the understudied but significant determinants and bank performance.

Digital Banks' performance

It is important for any organization, including banks, to measure their performance. A performance management system will help them improve weak areas and maintain vital areas to remain competitive in the market (Gallizo et al., 2011). However, this cannot be achieved without using innovative technologies and methods to provide competitive services. To begin their literature study, Neely et al. (2000) defined performance as "the quantification of an action's efficiency and effectiveness." Wei and Nair (2006) classified company performance into three distinct categories: organizational, departmental, and individual. They argued that organizational performance encompasses strategic level performance, departmental performance encompasses functional level performance, and individual level performance encompasses operational level performance. To maximize performance, organizations or banks must perform well at all levels, including the strategy level, the functional level, and the individual level. Therefore, banks must implement digital technology at every level to fully absorb the basics of digitalization.

Perceived Security

Wei and Nair (2006) said that consumers are an integral aspect of a company and that firms view customers as the success engine. As a result, to provide better services and please customers, banks give safe and secure digital services to customers, enabling banks to improve their performance. Massilamany and Nadarajan (2017) discovered that security is a significant aspect that influences human behavior in adopting digital banking. This may help banks enhance their performance in customer acquisition and return on assets and equity. In addition, Gupta (2017) and Yeremenko and Rudskaya (2016) discovered that security is essential in convincing clients to use digital banking services. They suggested that customers who feel unsafe may be hesitant to adopt digital banking services.

Perceived Ease of Use

Perceived usability is a crucial component of the technology

adoption model (TAM). Davis et al. (1989) defined perceived ease-of-use as the "individual's perception that using a certain system will be effortless." Mufarih et al. (2020) discovered that perceived ease-of-use influences banks' performance positively. In addition, Gao and Bai (2014) discovered that the perception of digital banking's usability predicts good user behavior. In addition, Aziz and Dali (2019) discovered that the perception of digital banking's usability predicts a favorable attitude toward its use. Kallanmarthodi and Vaithyanathan (2012) state that perceived simplicity motivates users to utilize digital banking. According to Kitsios et al. (2021), perceived ease-of-use influences an individual's propensity to utilize digital banking.

Digital Banking Innovation

According to Saunila and Ukko (2012), innovation is "transforming an idea into goods and services that satisfy client demands and desires." Digital banking was defined by Pavithra (2021). as conducting financial transactions via the Internet using secure websites. Digital banking offers several benefits for customers, including borderless transactions and easy access. Still, with the rapid technological advancements, the banking sector must be innovative while offering its services digitally to satisfy customer demand and requirements and compete in the market. In this context, McIntyre (2019) says that public cloud, artificial intelligence, and mobile banking are novel techniques utilized by banks to boost their digital presence. The ultimate objective of these digital banking innovation methods is to enhance the performance of the banking industry to attract and keep more clients. In addition, innovation in digital banking will help banks remain competitive in the market and contribute to economic growth. In addition, Mbama et al. (2018) discovered that digital banking innovation positively affects banks' performance by satisfying consumer requests and enhancing customer services. The authors explained that for banks to remain competitive, they must offer more innovative digital services.

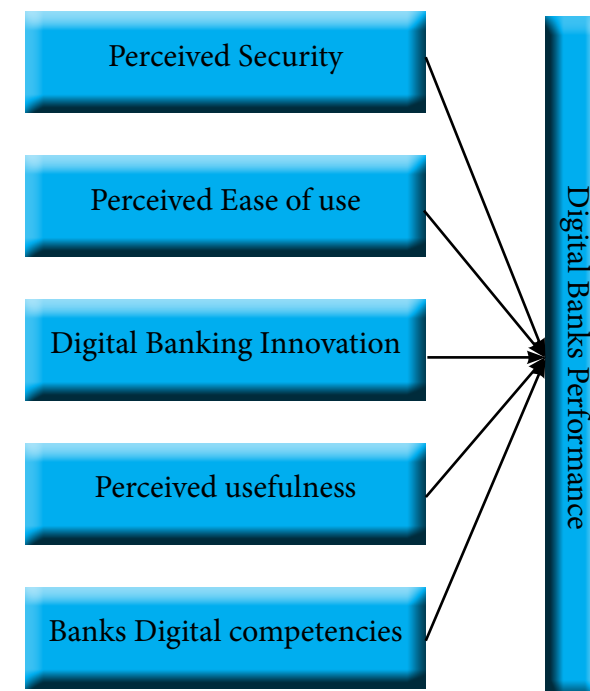
Perceived Usefulness

Perceived usefulness is another crucial component in the concept of technology adoption (TAM). As stated by Davis et al. (1989), perceived usefulness is the degree to which an individual believes that employing a particular method will enhance their performance. In this context, Mufarih et al. (2020) discovered that perceived utility influences an individual's decision to utilize a specific technology, such as digital banking, to access banking services. In addition, Aziz and Dali (2019) discovered that a good attitude toward digital banking is predicted by perceived usefulness.

Kallanmarthodi and Vaithyanathan (2012) argued that perceived utility is a significant factor in encouraging and supporting customers' use of digital banking Kitsios et al. (2021) Kitsios. Therefore, when individuals perceive digital banking as a valuable instrument for banking services, they will be more motivated to utilize it, attracting and keeping more customers, thereby enhancing the bank's performance.

Banks Digital Competencies

McIntyre (2019) noted that numerous criteria help establish whether a bank has digital skills. These aspects include mobile banking, data analytics and artificial intelligence, open banking platform as a service, borderless business activities, data-driven, public cloud, team sports, innovation at the center, fintech engagement, and technology and engineering talents with high value. McIntyre (2019) proposed that banks abandon conventional banking practices and embrace that mobile banking is the foundation of truly digital banking. Therefore, a bank is digitally competent if it can implement mobile banking instead of branches, ATMs, and call centers. In addition, the bank's use of data analytics and artificial intelligence is another indication of its digital competence. In addition, he noted that the public cloud and the approach to human resources that adds value to technology and engineering talents are other indicators of the banks' digital competencies. Therefore, their performance and operational success are enhanced when banks exhibit digital competencies. In addition, Kombe and Wafula (2015) emphasized that clients must have digital banking knowledge and ICT skills to improve bank performance.



Hypothesis

H1: Banking customers' perceived security positively influences a bank's performance.

H2: Banking customers' Perceived ease of use positively influence a bank's performance.

H3: Digital banking innovation positively influences a bank's performance.

H4: Banking customers' perceived usefulness positively influences the bank's performance.

H5: Banks' digital competencies positively influence bank's performance.

Methodology

To fulfill vision 2030, Saudi Arabia is relentlessly pursuing digitalization in every industry, including banking. In this connection, the Saudi Central Bank (SAMA) gave two digital banking operating licenses to STC and Saudi digital banks in November 2021. Previously known as STC pay, STC bank will now operate as an entirely digital bank under the name STC bank. The Saudi government does these steps to promote digital banking further so that more clients would be drawn to these digital banking services, which will subsequently support digital banks in enhancing their performance. Other nations, like Pakistan, Australia, and Malaysia, took comparable steps to promote digital banking. To remain competitive in the market, digital banks must evaluate customer behavior and the nature of digital services to attract and keep more clients. With this as a backdrop, the objective of this study is to identify the critical performance variables for digital banks. This study's objective is to investigate the relationship between perceived security, perceived ease-of-use, digital banking innovation, perceived utility, and digital competencies and the success of digital banks.

Data Collection

Specifically, two different questionnaires were constructed and distributed to collect data from respondents. In the first questionnaire, questions linked to banking consumers utilizing banking services were asked; this questionnaire aimed to learn what banking customers believe about security, usability, utility, innovation in digital banking services, and their digital competencies. In the second study, personnel in the banking industry were asked to evaluate the performance of digital banking. The data was collected via convenience sampling from both banking customers

and personnel of digital banks. 500 questionnaires were provided to banking consumers, while 200 questionnaires were distributed to workers working in digital banks in Pakistan, Saudi Arabia, Malaysia, and Australia, among others. After completion, a total of 226 questionnaires were returned by banking customers, and digital bank workers completed 64 questions. After “cleaning” the data, 210 customer questionnaires and 61 employee questionnaires were used in the analysis. For data collection, all scales were derived from prior studies. Here are the specifics of the measurement scales:

Measurements

Alan McIntyre's (2019) 10 items were accepted to test banks' digital capabilities, with slight modifications: “1- My bank has a mobile-first distribution approach. 2- My bank employs technology to eliminate back-office operations. 3- My bank favors Open Banking 4- My bank is prepared to test the limits of its business model. 5- My bank becomes an entirely data-driven enterprise 6- The default infrastructure for my bank is the public cloud. My bank recognizes that true enterprise agility is a team sport. 8- The heart of my bank's business strategy is innovation. 9- My bank's fintech engagement model is structured. 10 – My bank's culture and HR strategy place a premium on technology and engineering talents.”

To measure the security variable, Pavithra (2021) 4-item scale was utilized. These include “1- Security concerns have a substantial impact on the use of digital banking” and 2- I am concerned about the security of my digital banking transactions. 3- Greater trust in your network service provider is necessary for secure transactions 4- Digital banking operations necessitate technological knowledge to execute secure transfers.” Wei and Nair (2006)'s ten performance indicators were adopted to evaluate the bank. They categorized corporate performance into organizational, departmental, and individual levels. Performance at the organizational level was judged using four criteria: “1- Enterprise is successful, 2- Enterprise serves the needs of its clients, 3- Enterprise's future performance is secure, and 4- Enterprise is well-respected within the industry.” The performance of a department was judged using three criteria: “1. Department provides a significant contribution to the organization, 2. Department operates well as a team and 3. Department accomplishes its performance goals.” Individual performance was also measured using three items: “1-Individuals are satisfied working here, 2-Individuals are usually happy working here, and 3-Individuals are pleased with their performance.”

Utilizing 10 items adapted from Kitsios et al. (2021), the perceived utility was quantified “1- The use of digital banking applications or systems improves the quality of my work, 2 - The use of digital banking applications or systems makes my job more regulated, 3 - The use of digital banking applications or systems enables me to complete my tasks more quickly, and 4 - The use of digital banking applications or systems supports crucial facets of my work. 5- Using digital banking tools or systems improves my work productivity. The adoption of digital banking software or systems improves my work efficiency. 10-I believe that digital banking applications or systems generally benefit my profession.

Using 10 items adapted from Kitsios et al. (2021), the perceived ease-of-use was measured “I find it difficult to use automated digital banking applications or systems, 2 - It is simple for me to learn how to operate digital banking applications or systems, 3 - Interaction with digital banking systems or applications is always difficult, 4 - I find digital banking applications or systems easy to use to accomplish my goals, 5 - Digital banking applications or systems connect rigidly and inflexibly. The interaction with digital banking applications or systems demands a tremendous degree of mental effort. 8- My experience with digital banking applications or systems has been straightforward and understandable. 9- I believe it requires much work to utilize digital banking applications or systems in general. 10 — I believe digital banking applications or systems are simple to use” Finally, digital competencies were evaluated based on four safety-related criteria, adapted from Al Khateeb (2017).

Analysis and Findings

To analyze the collected data, SPSS version 22 was used, and the reliability of the constructs was measured as reported in table 1 below. Furthermore, correlation and regression analysis were used to examine the nature of relationships among variables.

Table 1: Reliability Test

Variables	Reliability
Perceived ease of use	0.65
Perceived usefulness	0.68
Perceived Security	0.60
Digital banking innovations	0.71
Banks digital competencies	0.77
Digital Banks performance	0.81

Notes: $\ast > 0.6$ (Bhatti & Sundram, 2015)

Table 2: Demographic profile

Demographics	No. of Banking Customers	Percentage	No. of Banking Employees	Percentage
Gender				
Male	155	73.9	48	75.6
Female	55	26.1	13	21.3
Age				
18-28 years	98	46.6	15	24.5
29-39 years	66	20.9	30	49.1
40 and above	44	20.9	16	26.2
Education				
Diploma	34	16.1	1	1.6
Graduates	110	52.3	40	65.5
Masters	55	26.1	20	32.7
Others	11	5.2	0	0
No. of years' using/working in digital banking				
less than 2 years	128	60.9	45	73.7
3-4 years	65	30.912	10	16.3
4 years and above	17	8.0	6	9.8

Table 3: Descriptive Statistics and Correlations

Variables	Mean	SD	1	2	3	4	5
Perceived usefulness	3.11	0.33					
Perceived ease of use	2.89	0.22	0.17				
Perceived Security	2.55	0.19	0.25	0.19			
Digital banking innovation	3.11	0.49	0.22	0.44	0.27		
Banks digital competencies	3.20	0.42	0.27	0.55	0.21	0.33	
Digital Banks performance	2.99	0.39	0.38	0.29	0.38	0.39	0.45

Notes: $p < 0.05$ (Awais Bhatti et al., 2014).

Table 4: Multiple Regressions for Psychological Attributes

Independent Variables	Beta	t-value
Perceived ease of use	0.41	2.33
Perceived usefulness	0.28	3.14
Perceived Security	0.33	2.44
Digital banking innovations	0.45	4.89
Banks digital competencies	0.44	5.22
Digital Banks performance	0.39	
F-value	79.0	
Durbin Watson	2.87	
R Square	0.55***	
Adjusted R square	0.65***	

*** $p < 0.01$; t-values > 1.96 (Awais Bhatti et al., 2014).

Regression results, as presented in table 4, explain that the relationship among independent variables (perceived ease-of-use, perceived security, perceived usefulness, digital banking innovations, the bank's digital competencies) and digital bank's performance has a statistically significant correlation ($p < 0.001$; Awais Bhatti et al. (2014). The regression results showed that a 55 percent variation (R-square 0.55) in digital bank performance could be explained by perceived ease of use, perceived security, perceived usefulness, digital banking innovations, and digital competencies. In addition, a bell-shaped histogram and P-P plots fulfilled the normality requirement of the sample. The Durbin-Watson coefficient of 2.01 was between the acceptable limits of 1.5 to 2.5.

The regression analysis results reported that tested relationships are significant at $p < 0.001$ (Awais Bhatti et al., 2014) and suggested that the tested hypothesis should be accepted for H1, H2, H3, H4, and H5. The beta value (standardized coefficient) of perceived ease-of-use style ($\beta = 0.41$; t-value=2.33) showed that the perceived ease-of-use positively influenced digital banks' performance. In addition, perceived usefulness ($\beta = 0.28$ t-value=3.14) showed that perceived usefulness predicts the higher performance of digital banks. Similarly, perceived security and digital bank performance have a positive relationship ($\beta = 0.33$ t-value=2.44). In addition, the results of this study also reported a positive relationship between digital bank innovations and digital bank performance ($\beta = 0.45$; t-value=4.89). Last but not least, the results of this study found that the banks' digital competencies have the highest impact on digital banks' performance ($\beta = 0.44$ t-value=5.22).

Discussion

The 21st century has brought about numerous human, societal, economic, and corporate changes, where digitization is transforming daily life. Similarly, the banking sector, which plays a crucial role in economic development, is transitioning from traditional to digital banking. Banks offer unique and creative services to their consumers, enabling them to increase performance and maintain market competitiveness. Pavithra (2021) suggested that banks can enhance their performance by providing their customers with secure and dependable digital banking services. However, without innovation in the provision of digital services, banks will not be able to attract and retain customers, which is crucial for improving bank performance. In this context, Wu et al. (2006) distinguished four distinct types of innovation: radical, disruptive, incremental, and transitional.

Additionally, he emphasized that banks should be innovative in these areas to enhance their performance by offering their consumers excellent and unique digital services. The findings of this study indicate that digital banking innovation favorably affects bank performance and that they correspond with and complement the findings and conceptualization of Wu et al. (2006). One of the possible explanations for these findings could be the intense market competition coupled with the digital revolution, which has resulted in banks providing creative and distinctive services with various features to attract and retain consumers. Therefore, banks that provide innovative services attract and retain more clients, eventually contributing to their enhanced performance.

Similar to the innovativeness of digital banking, digital competencies are an important component that can help banks enhance their performance. The results of this study indicate that digital competencies have a beneficial effect on bank performance. These results are comparable to those of Kombe and Wafula (2015). Their study determined that clients' ICT competencies impact internet banking's effectiveness, eventually improving bank performance. One possible explanation for these findings could be the banks' training and development programs for employees' skills and competencies (Awais Bhatti et al., 2014). According to the researcher, organizations sometimes implement modern and complex systems to manage business operations while working in the sector. Still, their personnel cannot use these systems due to a lack of skills and competencies. Therefore, when banks provide their staff with skill and competency development programs, it enables them to produce innovative services, creating a market advantage.

Perceived security is a significant component that determines bank performance, according to the study's findings, which are comparable to those of Gupta (2017). The possible explanation for these results could be that clients cannot utilize digital banking services unless they believe it is safe. Customers will not use digital services, regardless of the creativity employed to construct them, because security is a significant issue for employees utilizing digital banking (Zainab et al., 2017). Similarly, if these services are difficult to use, clients would be hesitant to utilize them, as most senior customers with common IT knowledge and skills prefer traditional banking services to digital banking services. These reasons are supported by the findings of this study, which indicate that usability favorably affects bank performance. If clients believe digital banking services to be user-friendly, they will be more likely to use them. Banks will attract and retain more consumers, which will increase their profitability. These findings are comparable to those

of Kitsios et al. (2021), who discovered that the ease of use of digital banking influences customer behavior. Lastly, the results of this study indicate that perceived usefulness is a crucial aspect in assisting banks to enhance their performance. These findings are consistent with Mufarih et al. (2020)'s explanation that perceived usefulness assists the client in deciding how to use a particular technology. Therefore, when customers view the system as useful, their propensity to utilize it will increase, and banks will acquire more clients, which will help them enhance performance.

Implications

Similar to other research, this work has both theoretical and practical consequences. Theoretically, the findings of this study will expand the bounds of knowledge, allowing researchers and academics to comprehend the significance of individual and technical elements in enhancing bank performance. Previous studies did not empirically validate the measurement scale for digital banking competencies. This study evaluated the assessment scale for digital competencies, which will aid comprehension of the idea of digital competencies. Similar to theoretical ramifications, this work has some practical consequences. First, the outcomes of this study will aid banking professionals and policymakers in comprehending the significance of perceived utility, perceived security, ease-of-use, banks' digital capabilities, and digital banking innovation on the success of digital banks. Secondly, the findings of this study indicated that operation managers in the banking industry should ensure that their employees are equipped with advanced digital skills that will allow them to effectively perform daily job tasks and develop innovative methods for offering digital banking services.

Limitations and Future Research Directions

Similar to prior studies, this one has a few shortcomings that will provide opportunities for future researchers. Firstly, the response rate from personnel working in the banking sector was low, which may hamper understanding of the bank's performance. Future research should employ a larger sample size and target population to validate the current study's conclusions. Second, convenience sampling was utilized to acquire the data, which may not be appropriate for the current study's design. Future research should concentrate on several clusters to better understand the significance of perceived utility, perceived security, usability, banks' digital competencies, and digital banking innovation. The age group may also have a role in determining the significance of these variables. Since generations X, Y, and baby boomers exhibit distinct behaviors, future research should investigate how

age groups or different types of generations will respond to perceived utility, perceived security, ease of use, banks' digital skills, and digital banking innovation.

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