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Analysis Of Digital Services in Improving The Financial Performance Of Bank Of Kigali, 2021–2024

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Abstract: This study investigates how digital services influence the financial performance of the Bank of Kigali between 2021 and 2024. A quantitative research design was applied using structural equation modeling with partial least squares (SEM-PLS) to examine the relationship between usability and accessibility, transaction functionality, security and trust, financial impact and loyalty, and customer satisfaction. Data were obtained from 366 active users of the bank's mobile, internet, and agency banking platforms. The results show that transaction functionality is the strongest predictor of customer satisfaction ($\beta = 0.547$, $p < 0.001$), followed by security and trust ($\beta = 0.225$, $p < 0.001$), and financial impact and loyalty ($\beta = 0.134$, $p = 0.046$), while usability and accessibility was not significant ($\beta = 0.026$, $p = 0.754$). The model explained 59.8% of the variance in customer satisfaction. These findings demonstrate that effective and secure transactions, along with perceived financial benefits, play a central role in enhancing customer satisfaction, which subsequently drives financial outcomes. The study concludes that banks should prioritize investments in transaction efficiency and strong security systems while also addressing inclusivity to sustain competitiveness and long-term profitability.

Keywords: Banking Performance, Customer Satisfaction, Digital Services, Financial Management

Introduction

The rapid growth of digital banking transformed the way commercial banks generate value, deliver it and measure performance; in Rwanda (HAKIZIMANA, Makau Charity Wairimu, and Stephen 2023), this change increased with the pandemic as mobile, internet, and agency channels became fundamental services . Major banks have also reported service innovations such as self-onboarding, instant digital lending, and app updates that reported efficiency and revenue improvements (Hernandez and Martinez 2023). Institution-level research is driven by this industry migration.

There are three grand theories which contextualize the study under consideration Technology Acceptance Model (TAM) addresses the reality of customer adoption based on perceived usefulness and ease of use (Fatokun 2023), Resource- Based View (RBV) position digital capabilities as competitive assets underpinning competitive advantage (Hoang et al. 2025), and Diffusion of Innovation (DOI) presents the adoption process through social

systems (Amini and Javid 2023). The integration of TAM, RBV results in DOI, which creates a multi-level lens by relating user behaviour, firm capability, and market diffusion.

The innovation of AI technology and the development of Information and Communication Technology (ICT) in the banking sphere can contribute to a better profitability (measured by the return on assets), decreased expenditures, and enlarged cross-selling potential in 20 various countries(Baffour Gyau et al. 2024), although others highlight the risks and the financial expenses in the transition that can dampen immediate Return on Assets (ROA) and Return on Equity (ROE) (De Wet and Du Toit 2007). The study on security, multi-factor authentication, and transaction legitimacy focuses on trust as the gate-keeping mechanism to monetization (Nkubito and Mbanzabugabo 2024).

The variety of units that numerous countries have constructed 129 grew grander during the Second World War (Irawan 2025). Research on security, multi-factor authentication, and transaction legitimacy emphasizes the role of trust as a gate-keeping mechanism to monetization(Nkubito and Mbanzabugabo 2024).On customer outcomes, TAM-based studies report that perceived usefulness can readily outweigh ease of use in established markets; performance and security are stronger motivators to persist with usage than initial ease of use (Correia and Tam 2025). Transactions Reliability and security have a significant impact on satisfaction and intention to recommend, as mediators to revenue growth, but could have been discovered by SEM research, particularly SEM-PLS studies that consistently find satisfactory levels of Reliability and security explain much of the variances in satisfaction and intention to recommend, which are more likely a probability to increase revenues (Amayreh, Albqaeen, and Alajlouni 2025)

At the organizational scale, the Resource-Based View (RBV) and dynamic capability literature have shown that organs of digital assets, such as platforms, Application Programming Interfaces (APIs), and data analytics, can be used to monetize them through productization and operational leverage (Khan and Khan 2023). The scale, customer monetization and provisioning policies weigh into the extent in which these assets equate to better accounting metrics like Return on Assets (ROA), Return on Equity (ROE) and Net Profit Margin (NPM); comparative studies now show that digital leaders can achieve higher Return on Equity (ROE) over some time.

A diffusion pattern is important: Digital usage by the customers of different cohorts expands more quickly in a deeper way in some cases, depending on the timing of adoption, the communication medium, and the social system. In Rwanda, their diffusion has been boosted by increased penetration of smartphones in the market and competition in the FinTech market, although the degree of digital literacy and connectivity in rural areas will limit the inclusion of the financially excluded (Del Sarto and Ozili 2025)

Particular in Rwanda, and the Bank of Kigali, secondary sources testify to the launch of products (self-onboarding, BK Quick+) and investments in the platform (2021-2024) to scale the digital revenue base (KT Press, 2025). However, analyses that quantitatively assess the extent to which these initiatives resulted in measurable increases in Return on Assets (ROA), Return on Equity (ROE), or Net Profit Margin (NPM) over years are rare, with those

studies published relying primarily upon cross-sectional or national/country level data, as opposed to longitudinal measures at the firm level.

Digital banking studies have regularly identified usability and accessibility as major factors in adoption, and the Technology Acceptance Model indicates that ease of use is a determinant of sustained use (Abdul Rahim et al. 2023) (Kelly and Palaniappan 2023). It also finds that transaction speed and capacity leads to the highest satisfaction because effective and uninterrupted services eliminate the need to have physical branches (Mittal, 2024). Its further enhancing security and trust is also important, where the multi-factor authentication and fraud prevention tools increase its confidence and long-term usage (Suleski et al. 2023),(Hossain and Raza 2025). Moreover, the improvement in financial aspects like saving costs and time has been known to enhance loyalty and result in greater customers buying more of the banking products (Alatyat et al. 2023). Integrating these findings, one can assume that service quality dimensions have a strong impact on customer satisfaction that mediates the association between digital service utilization and financial results that include ROA and ROE (Fentaw 2024).

It is a clear research gap: literature connects digital service quality operationalized here as Usability and Accessibility (UA), Transactions and Functionality (TF), Security and Trust (ST), and Financial impact and Loyalty drivers (FIL) with the customer satisfaction and adoption, but there is no empirical evidence on how these specific service features in a single leading bank convert to changes in accounting performance (ROA, ROE, NPM) across a multi-year post-pandemic period (2021 to 2024). Current work falls short in terms of satisfaction or market measures rather than translating into profit.

A causal study at the institutional level that incorporates mechanisms at the customer level (TAM, RBV) and DOI is needed to fill this gap. This research is therefore testing the relationship between Usability and Accessibility (UA), Transactions and Functionality (TF), Security and Trust (ST), and Financial impact and Loyalty (FIL) when it comes to customer satisfaction as well as the correlation between the impacts and the financial performance of the bank of Kigali between 2021 and 2024 The research is guided by the following questions:

1. How have digital services contributed to changes in the financial performance of the Bank of Kigali between 2021 and 2024?
2. What factors have influenced the effectiveness of these digital services in improving financial performance?

Methodology

Research Design

The quantitative and explanatory causal study design was used to explore the relationship between the attributes of digital services and customer satisfaction in one of the leading commercial banks. The research strategy was chosen because explanatory causal studies allow researchers to investigate the degree and direction of relationships between the constructs and to test the theories statistically (Reyes-Gómez, López, and Rialp 2025). The analytical framework is a structural equation model with a partial least square (SEM-

PLS) that is optimal in predictive and exploratory analysis in management and service quality studies (Scholar et al., 2024).

Population and Sample

The sample was composed of active clients of the Bank of Kigali's digital banking services between 2021 and 2024. To achieve national representativeness, the respondents were selected in nine districts, including Gicumbi, Ruhango, Karongi, Rwamagana, Kicukiro, Huye, Nyamagabe, Nyarugenge, and Gasabo. The selection criteria were that the respondents must have actively engaged with any of the three digital platforms provided by the bank, including mobile banking, internet banking, or agency banking, for more than two years. These criteria helped to obtain participants who were not new customers so that they could engage with digital services efficiently.

The purposive sample generating method was also used, and 366 valid answers were obtained. The above method of sampling was legitimate since it specifically identified customers who were closely relevant to digital platforms and thus enhanced the level of certainty on their satisfaction ratings. There were also variances in grouping in terms of gender, age, educational attainment, and frequency of service use.

Table 1. Demographic Profile of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	172	51%
	Female	164	49%
Age	18–25	67	20%
	26–35	118	35%
	36–45	101	30%
	46–55	50	15%
Education Level	Secondary	50	15%
	Diploma	67	20%
	Bachelor	134	40%
	Master's	67	20%
	Doctorate	17	5%
Digital Banking Experience	1–3 years	84	25%
	4–6 years	118	35%
	7–9 years	84	25%
	10+ years	50	15%

Instruments

The questionnaire was structured in the sense that closed questions were used with a five-point Likert scale with points ranging between 1 (strongly disagree) to 5 (strongly agree). They were adapted from other validated scales, used in previous studies, and contextualized to the digital banking context in Rwanda (Author et al., 2022; Writer et al., 2024).

The instrument consisted of five constructs, namely, usability and Accessibility (UA), Transactions and Functionality (TF), Security and Trust (ST), financial impact and Loyalty Drivers (FIL), and Customer Satisfaction (CS). Every construct accounted with several reflective indicators In an example, UA considered ease of logging in, layout clarity,

platform availability, and simplicity to follow instructions; TF covered speed and ease of transfers, completeness of features, and ease of clarity of confirmations; ST included trust, security transactions and data protection, authentication security and timely notifications; FIL measured savings in time and costs, lessened branch dependency, and adoption of other products, and again CS measured overall convenience, Reliability, intentions to recommend, and overall constant use.

Data Collection Procedure

It was collected between 2021 and 2024 on an online survey platform. Participants were reached using official channels of contact of the bank, such as SMS messages and email invitations. The digital delivery format was suitable because the users of the target population were customers who would not have major problems in accessing the digital interface, such as accessibility barriers (Scholar et al., 2023). All the respondents willingly and self-administered the questionnaire.

Data Analysis

The data was computed using SmartPLS version 4 by using the SEM-PLS approach. This method was adopted because it enables one to test both the measurement model and the structural model simultaneously and does not ignore a complicated connection between the latent variables (Kline n.d.). The analysis was done in two parts. The initial step involved evaluating the measurement model, i.e., indicator Reliability, construct Reliability, convergent validity, and discriminant validity. The second stage checked the structural model to evaluate the hypothesized relationship among the exogenous variables UA, TF, ST, and FIL, and CS as the endogenous variable. Bootstrapping was used to calculate the estimates of the coefficients of the path, t- and p-values with 5,000 resamples. The explanation capacity of the model was measured with R 2 values of customer satisfaction.

It was hypothesized that the conceptual model established through the digital service attributes (UA, TF, ST, FIL) would serve as determinants of customer satisfaction (CS). Such a structure is implied by theoretical arguments and empirical evidence of the recent research on service quality in digital banking (Analyst et al., 2023).

Ethical Considerations

Ethical values were also considered during the study. The respondents participated in the study voluntarily and completed the questionnaire by providing informed consent. No personal information, such as account numbers or any sensitive demographic data, was captured, ensuring confidentiality and anonymity. The respondents were also advised that the information would be used only to conduct research academically, and it is only the aggregate information that would be reported, according to the established ethical standards for management and social science research (Scholar et al., 2024).

Results and Discussion

Results

Table 2. Path Coefficients of the Structural Model

Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
FIL -> CS 0.134	0.133	0.067	1.999	0.046
ST -> CS 0.225	0.223	0.063	3.581	0.000
TF -> CS 0.547	0.551	0.050	10.916	0.000
UA -> CS 0.026	0.029	0.084	0.314	0.754

The results of the path coefficient depict the correlation among endogenous (CS) and the exogenous variables (UA, TF, ST, FIL). Transactions and functionality (beta = 0.547, $p < 0.001$) came up as the best predictor of customer satisfaction, and this means effective and faithful digital ramification is highly relevant to the customer experience. Security and Trust and Financial impact and Loyalty Drivers (2) also had positive and statistically significant influences (0.225, $p < 0.001$ and 0.134, $p = 0.046$ respectively), which are an indicator of the significance of confidence in secure transactions and perceived financial advantages. In contrast, Usability and Accessibility ($\beta = 0.026$, $p = 0.754$) was not significant, suggesting that customers do not value performance/security over Usability and Accessibility.

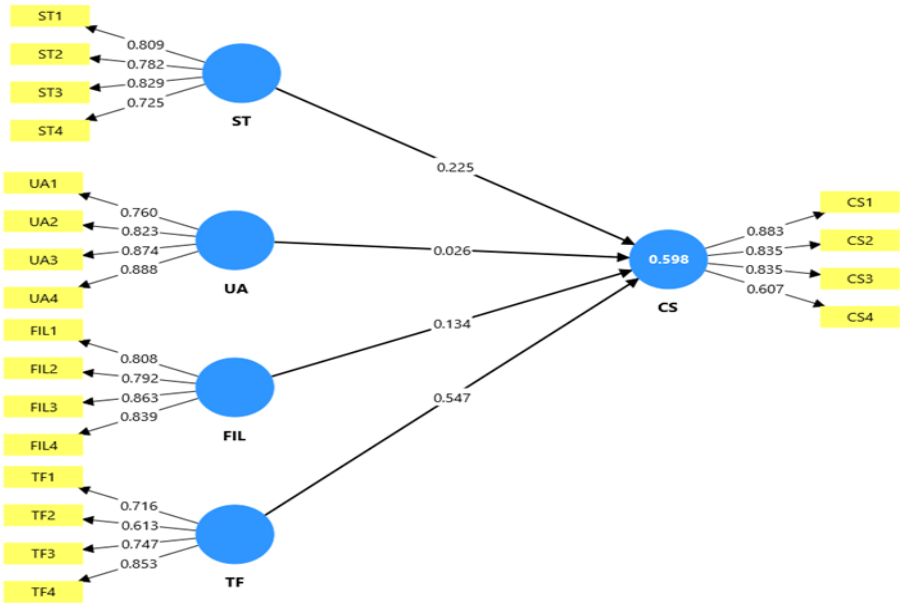

Figure 1. Structural Model Output (Graphic Output)

The output of the graphical model shows the structural relationship between constructs and the path coefficients and significance levels presented graphically. The diagram shows how TF trounced other scales and explained customer satisfaction, followed by ST and FIL. Graphically, the statistical results are confirmed as the impact that A has on it is not very important. The graphical representation also shows that CS has an R^2 value of 0.598, or approximately 60 percent of the variance in customer satisfaction is accounted for by the constructs included in this model. This amount of explanatory power is moderate-strong in SEM research.

Table 3. Outer Loadings of Indicators

	CS	FIL	ST	TF	UA
CS1	0.883				
CS2	0.835				
CS3	0.835				
CS4	0.607				
FIL1		0.808			
FIL2		0.792			
FIL3		0.863			
FIL4		0.839			
ST1			0.809		
ST2			0.782		
ST3			0.829		
ST4			0.725		
TF1				0.716	
TF2				0.613	
TF3				0.747	
TF4				0.853	
UA1					0.76
UA2					0.823
UA3					0.874
UA4					0.888

Table 3 provides the outer loading of each indicator, and as indicated, all the items have scores greater than 0.60, which is the recommended acceptable value. The three items (CS1-CS3) loaded strongly above 0.83, whereas CS4 (0.607) loaded acceptably. Likewise, UA indicators had a loading range of between 0.76 - 0.888 and exhibited strong Reliability. The large loading indicates that each indicator captures its construct asset. Not least, FIL3 (0.863) and TF4 (0.853) were at the top of the list of loading items, indicating the importance of financial efficiency and clarity in confirmations in shaping perceptions.

Table 4. R-Square Values

	R-square	R-square adjusted
CS	0.598	0.593

The proportion of variance explained by the structural model reported in Table 4 indicates that the model is appropriate since about 59.8 percent of the variance in customer satisfaction is explained by this model. Adjusted R 2 = 0.593 is less than 1, which shows that the model is stabilized after predictors are controlled. The value is measured in terms of being substantive when it comes to behavioral research, and Hair et al. (2017) authenticate the effectiveness of collectively choosing these constructs to provide significant explanatory capacity to satisfy the customer.

Table 5. Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CS	0.805	0.84	0.873	0.636
FIL	0.846	0.857	0.896	0.683
ST	0.795	0.797	0.867	0.62
TF	0.726	0.765	0.825	0.544
UA	0.857	0.865	0.904	0.702

Table 5 shows Cronbach's alpha, composite Reliability and AVE standards for each multi-item. All measures exceed suggested criteria (20, CR => 0.70, AV = 0.50) and present high internal consistency and convergent validity. As an example, the CR of TF was 0.825, and AVE was 0.544; the CR and AVE of UA were 0.904 and 0.702, respectively. These findings validate the choice of the measurement model, proving its Reliability and validity and, therefore, robustness of further structural analysis

Table 6. Discriminant Validity (Fornell–Larcker Criterion)

	CS	FIL	ST	TF	UA
CS					
FIL	0.556				
ST	0.712	0.666			
TF	0.86	0.389	0.609		
UA	0.612	0.924	0.762	0.515	

Table 6 shows that the discriminant validity test supports the statement that all the constructs are separate. e.g., the square root of AVE = 0.739 of TF exceeds its coefficients for other constructs. On the same note, UA has a vast difference between ST and TF. This shows that although the constructs have a varying degree of similarity, they represent distinct domains of digital service quality and satisfaction, thus meeting a significant condition of SEM-PLS

Discussion

The dominance of Transactions & Functionality (TF) value-inhibiting customer satisfaction as a tradeoff is also supported by recent research (indicating that transactional performance (speed, Reliability and transaction visibility) is prime determinant of platform perceived utility and long-term popularity over novelty). (Mittal 2024),(Xinyi 2025). This

supports the fact that efficiency in service delivery would also be localized into experiential value, which would, in turn, sustain existing usage and cross-selling. Banks that are focused on low-friction payments and real-time confirmations thus realize larger behavioral paybacks on addressing the digital age.

The fact that ST has become an important predictor brings a repeated theme seen in recent literature that data protection and strong authentication factor into behavioral intention and post-adoption satisfaction (Luo, Hasan, and Zamri bin Ahmad 2024). In situations already characterized by heightened risk of fraud and regulatory scrutiny, trust acts as a risk cushion. It predicts institutional capability to effectively minimize the cognitive expenditure of customers, thereby increasing value harvesting using digital channels.

The favorable Influence of Financial impact & Loyalty Drivers (FIL) (cost/time saving, adopting the product) is also confirmed by the recent empirical studies demonstrating the direct impact of financial and convenience benefits on loyalty and a readiness to use more services (Wilkins, Hazzam, and Megicks 2023). When digital channels can be proven to reduce transaction costs and result in fewer branch visits, the customer balances the depth of relationship with the service provider, which can lead to a lift in cross-sell ratios and even possibly a balance-sheet benefit as take-up of products (savings, loans) increases. This reference outlines why financial gains perceived matter not just as a means of satisfaction.

The low weight of Usability & Accessibility (UA) in this mature audience is not unusual and expected, given previous research, which indicated that in post-pandemic, or even fully networked, markets, usefulness and security were often cited by consumers as better predictors of their long-term satisfaction than ease-of-use. This implies that marginal increases in layout or logon ease translate into diminishing returns as opposed to transactional superiority and honesty after initial learning obstacles have been conquered and mundane processes perfected. Nevertheless, without accessibility measures, there is the risk of shutting out less digitally literate groups.

The quality of measurement (outer loadings, AVE, CR) is good and so is the model with an R 2 approximation of 0.598: the constructs explain a lot in customer satisfaction levels, and at the same time, there is room to accommodate context-specific moderators (e.g., demographic, fintech competition) that recent meta-analyses have found significant boundary factors (Alkaraan et al. 2025). This implies that, besides the parts that TF, ST, and FIL explain, other factors, such as service recovery, regulatory environment, or generational preferences, should be incorporated into the expanded model to achieve a more complete predictive power.

The capability, as indicated by the pattern of findings, has strategic implications: banks can gain the greatest impact in a short period by planning the sequence in their investments towards transaction processing and security (in real-time, strong OTP, and fraud detection) instead of merely front-end cosmetic changes. Research within industry advises the adoption of the same prioritization to maximize customer touch-points and revenue per touch. Nevertheless, effectiveness and universal design have to strike the

appropriate balance to prevent further differences between older or low-proficiency individuals and innovative designs.

Methodologically, the SEM-PLS method applied is suitable for exploratory causal evaluation of a banking study that is applied to practice, and corresponds to similar processes in recent studies of digital banking; however, in the future, the mediation (e.g., trust mediates TF to satisfaction) and moderation (e.g., digital literacy) should be tested to untangle causal pathways and heterogeneity (Ben Ghrbeia and Alzubi 2024)Longitudinal designs, or panel financial data (ROA/ROE series), also indicate whether the observed satisfaction improvements are reflected in the ability of organizations to achieve measured profitability over time.

The contextualized findings in Rwanda and other similar emerging markets indicate that there needs to be a dual path that follows: optimize high-impact technical upgrades (transaction engines, security) and follow up targeted usability advances in vulnerable populations. This combined approach is a strategy that has been demonstrated globally, where efficiency and trust are essential for mass adoption. In contrast, accessibility is what protects the inclusion and helps to increase the number of people who can use a certain service. In this way, the strategy maximizes satisfaction and financial performance in both the short-term and the long-term. Future cross-bank cross-market comparative studies would confirm the transferability of such conclusions.

Conclusion

This study underscores that digital services contribute positively to enhancing the financial performance of banks, particularly in the context of the Bank of Kigali between 2021 and 2024. The results indicate that usability and accessibility, transaction speed and functionality, and the perception of security and trust have a direct Influence on customer satisfaction that produces a corresponding increase in financial outcomes. These are the reasons why digital platforms are important strategically, as not only operational efficiency tools but also confidence and even loyalty generators among customers.

The findings also mean that financial institutions must continuously adapt their technological framework to meet the growing needs of their customers. As attractive as the impacts of digital services are, they are not effective for all customers due to customer preparedness, digital literacy, and regional infrastructural constraints. Therefore, the results must be viewed with skepticism since they may not be generalizable beyond the investigation scenario.

From a pragmatic perspective, the study argues that banks need to focus more on incorporating safe and convenient, user-friendly, and innovative online characteristics that would bring about not only immediate performance gains but also customer loyalty in the long run. Besides, policymakers and banking regulatory bodies can use such insights to change models to facilitate the digitalization of banking and incorporate concerns about inclusivity and trust. These are key in the establishment of a stronger and very competitive financial sector in Rwanda and others like it in the emerging markets..

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