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Digital Financial Inclusion Strategies and Service Quality: Evidence from Listed Commercial Banks in Nigeria

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ABSTRACT

The rapid evolution of digital financial inclusion strategies has significantly transformed banking service quality in Nigeria. This study examines the impact of mobile banking applications, internet banking platforms, USSD banking services, and digital payment solutions on service quality. Using a quantitative approach, data were collected from 366 customers of the top 5 selected commercial banks and analyzed through regression analysis. Findings reveal that mobile banking applications, internet banking platforms, USSD banking services, and digital payment solutions have the highest positive influence. The study concludes that digital financial innovations enhance service quality but require improved security and accessibility. It recommends policy interventions to strengthen infrastructure, enhance cybersecurity, and promote broader adoption of digital payment solutions for inclusive financial services.

Keywords: Digital Financial Inclusion, Service Quality, Commercial Banks, Customer Satisfaction, Mobile Banking.

INTRODUCTION

The rapid evolution of digital financial inclusion strategies in Nigeria has transformed the banking sector, driven by innovations such as mobile banking applications, internet banking platforms, USSD banking services, and digital payment solutions. These tools have become central to expanding financial access, particularly in a country where 36% of adults remain unbanked (World Bank, 2021). Mobile banking applications, for instance, have gained prominence due to Nigeria's high smartphone penetration, enabling real-time transactions and account management (Virginia et al., 2021). Similarly, internet banking platforms offer seamless online services, while USSD banking bridges the gap for users with limited Internet access through feature phones (Halima & Wepukhulu, 2020). Digital payment solutions, including instant transfers and QR codes, further streamline transactions, fostering a cashless economy aligned with the Central Bank of Nigeria's (CBN) policies. Despite these advancements, the interplay between these digital channels and service quality, encompassing reliability, accessibility, security, and user satisfaction—remains underexplored, posing challenges to sustainable financial inclusion.

A critical issue lies in the inconsistent service quality of these digital platforms. For instance, mobile banking applications, though widely adopted, frequently face technical glitches and downtime, undermining customer trust (Nasamu, 2020). Internet banking platforms, while efficient, grapple with cybersecurity threats, as evidenced by the Nigeria Deposit Insurance Corporation's (NDIC, 2018) report that 70% of banking frauds occur via electronic channels. USSD services, though vital for rural inclusion, suffer from network instability and complex user interfaces, limiting their effectiveness among low-literacy populations (Emezie, 2021). Digital payment solutions, despite their convenience, are plagued by transaction failures and delays, eroding user confidence. These challenges highlight a paradox: while digital tools expand access, their suboptimal service quality risks alienating the very populations they aim to serve.

Existing studies have examined individual components of digital banking such as mobile apps' impact on profitability (Virginia et al., 2021) or USSD's role in rural inclusion (Halima & Wepukhulu, 2020). Still, few analyze their collective effect on service quality and institutional performance. For example, while digital payment solutions enhance transaction speed, their reliability in Nigeria's infrastructure-constrained environment remains questionable (Okoye

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& Ezejiofor, 2013). Furthermore, the COVID-19 pandemic intensified reliance on these platforms, exposing vulnerabilities such as system overloads and fraud surges (NDIC, 2018). Regulatory frameworks, like the CBN's cybersecurity guidelines, aim to mitigate risks but lack enforcement, leaving gaps in service consistency. This fragmented landscape underscores the need for a holistic evaluation of how mobile banking applications, internet platforms, USSD services, and digital payment solutions collectively shape service quality and, ultimately, the financial inclusion goals of Nigeria's quoted commercial banks.

This research fills the existing knowledge gap through a study of digital financial inclusion strategies which explores the relationship between mobile banking and internet banking and USSD services and digital payments on service quality within the Nigerian banking sector. To offer useful suggestions for bank executives and legislators regarding tool optimizations that improve equitable, safe, and high-quality services, research will look at operational efficiency, security, and user satisfaction. The established research findings will advance digital inclusion framework development while creating technological solutions that match Nigeria's expanding banking user requirements.

OBJECTIVES

This study first examines the relationship between Mobile Banking Applications and Service Quality, focusing on how user-friendliness, reliability, and security features of mobile apps influence service quality. Also, the study assesses the impact of Internet Banking Platforms on service quality by evaluating the efficiency, accessibility, and cybersecurity measures of online systems. Equally, the study investigated the role of USSD Banking Services in shaping service quality, emphasizing their accessibility, simplicity, and network stability. Additionally, the study explores how Digital Payment Solutions affect service quality by analyzing their speed, reliability, and transparency.

LITERATURE REVIEW

Conceptual Review

Digital financial inclusion (DFI) strategies leverage technology to expand access to affordable financial services, addressing barriers such as geographic remoteness and socioeconomic disparities (Ozili, 2023). These strategies integrate tools like mobile banking applications (MBAs), internet banking platforms (IBPs), USSD banking services, and digital payment solutions to enhance financial accessibility. MBAs, for instance, facilitate remote transactions, fostering financial participation among previously unbanked populations, particularly in emerging markets (Abor et al., 2018). Similarly, IBPs enable real-time account management, improving financial autonomy but necessitating stable internet connectivity, a significant limitation in low-infrastructure regions (Meniago, 2025).

To bridge connectivity gaps, USSD banking services operate on basic mobile networks, ensuring accessibility for users without smartphones or internet access (Siano et al., 2020). Meanwhile, digital payment solutions such as mobile wallets and QR codes streamline transactions, reducing cash dependency and enhancing transparency (Koomson et al., 2020). However, the success of these tools' hinges on service quality factors, including reliability, security, and responsiveness. Studies indicate that transaction delays and security breaches undermine user trust, impeding adoption (Pokhrel & KC, 2024). For instance, USSD users frequently report frustration with slow menu navigation, highlighting the need for intuitive design (Olamilekan et al., 2022). Service quality is thus a pivotal mediator between DFI adoption and user satisfaction. While Parasuraman's SERVQUAL model (1988) remains foundational, recent adaptations emphasize digital-specific factors such as app responsiveness and cybersecurity (Pokhrel et al., 2024). Moving forward, addressing digital literacy gaps and infrastructural inequities is critical for ensuring inclusive financial ecosystems (Ozili, 2023; Koomson et al., 2020).

Empirical Review

The empirical findings from prior studies corroborate the significant impact of digital banking innovations on service quality. Komandla (2018) emphasizes that mobile banking applications enhance customer satisfaction through seamless transactions, real-time updates, and personalized financial management tools. Similarly, Chigori et al. (2020) highlight that mobile banking applications provide increased accessibility and efficiency, making them a dominant factor in improving service quality. Also, Ezechi et al. (2025) demonstrate that Internet banking platforms significantly enhance customer experience by offering 24/7 banking access, reducing reliance on physical branches,

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and streamlining banking operations. However, Hasan et al. (2025) caution that usability issues and cybersecurity risks may limit the full potential of Internet banking in improving service quality.

In the same vein, Musa & Al-Sammarraie (2024) recognize USSD banking as a vital tool in financial inclusion, particularly in regions with limited internet connectivity. Their study finds that USSD services provide cost-effective and accessible financial transactions, although security vulnerabilities and transaction limits remain concerns (Mwiya et al., 2021). Regarding digital payments, Putrevu & Mertzanis (2024) identify infrastructure challenges and security concerns as barriers to widespread adoption.

METHODS

Customers of the top 5 listed commercial banks in Nigeria were surveyed cross-sectionally as part of this study's descriptive survey research approach to gather primary data. A purposive sampling technique was used to determine the top five quoted commercial banks in Nigeria as of 2024, with an emphasis on publicly traded banks with the biggest asset sizes and clientele. This method gives a clear picture of the top tier of Nigeria's banking industry by guaranteeing that the chosen banks are reflective of the nation's top financial institutions. In order to ensure a thorough assessment of each bank's market presence and operational scale, the selection criteria were total assets, branch network, and customer base.

As of 2024, the top five quoted commercial banks in Nigeria by total assets are Access Bank, United Bank for Africa (UBA), Zenith Bank, First Bank of Nigeria, and Ecobank Nigeria, with customer deposits of N22.28 trillion, N14.89 trillion, N21.57 trillion, N16.72 trillion, and N10.37 trillion, respectively. The study used a total customer base of 180.3 million. Using Krejcie and Morgan's (1970) formula for determining sample size, a sample of 384 customers is deemed necessary for a 5% level of significance. The research used a multi-stage sampling method starting with selecting two bank branches in Lagos and Abuja after which it used a simple random sampling technique to proportionally sample respondents.

A structured questionnaire was disseminated using Google Forms and self-administration was used to gather the primary data. A five-point Likert scale is used in the survey to gauge respondents' opinions of online banking services. In addition to gathering demographic data, the two-part questionnaire evaluates the accessibility and contentment with online banking services. The Likert scale allows for complicated answers that fall between "strongly agree" and "strongly disagree." Senior academics' expert evaluation ensures content validity, and Cronbach's alpha is used to measure dependability; a threshold of 0.70 is deemed appropriate. The validity and reliability of the instrument are tested in a pilot study involving 36 bank clients. The results show satisfactory internal consistency and convergent validity as measured by AVE and composite reliability measures. In analyzing the data, descriptive statistics (means, standard deviations, frequencies, percentages), and the Ordinary Least Square Regression Model were used to test the relationship between the variables at a p-value less than 0.05. The model is stated as follows:

$$SQ = \alpha + \beta_1 MBA + \beta_2 IBP + \beta_3 UBS + \beta_4 DPS + \mu \quad \ldots\ldots\ldots\ldots\ldots 1$$

Where:

SQ = Service Quality

MBA= Mobile Banking Applications

IBP= Internet Banking Platforms

UBS= USSD Banking Services

DPS= Digital Payment Solutions

α = Intercept

β = Independent variable coefficient

μ = Error terms

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Research Article

RESULTS

Table 1 presents the descriptive statistics of the variables used in the study, including service quality, mobile banking applications, internet banking platforms, USSD banking services, and digital payment solutions, based on a sample of 366 respondents. The mean values indicate that mobile banking applications had the highest average rating (4.36), followed closely by service quality (4.30), internet banking platforms (4.22), digital payment solutions (4.17), and USSD banking services (4.10). The standard deviations suggest varying levels of dispersion, with USSD banking services (0.957) and digital payment solutions (0.953) exhibiting the highest variability, while service quality (0.736) had the least variability. The minimum and maximum values for all variables range from 1 or 2 to 5, indicating that respondents provided ratings across the full scale. These results suggest a generally positive perception of digital financial services and their contribution to service quality in the banking sector.

Table 1: Descriptive Statistics of the variables used in the study

	N	Minimum	Maximum	Mean	Std. Deviation
Service Quality	366	2	5	4.30	.736
Mobile Banking Applications	366	1	5	4.36	.764
Internet Banking Platforms	366	1	5	4.22	.916
USSD Banking Services	366	1	5	4.10	.957
Digital Payment Solutions	366	1	5	4.17	.953

Source; Field Survey, 2024

Table 2 presents the model summary of the relationship between digital financial services and service quality. The results indicate a strong positive relationship, with an R-value of 0.828, suggesting that the independent variables—digital payment solutions, USSD banking services, internet banking platforms, and mobile banking applications—collectively explain 68.6% of the variance in service quality, as reflected in the R Square value of 0.686. The adjusted R Square (0.682) confirms the model's robustness after accounting for the number of predictors. The standard error of the estimate is 0.415, indicating the average deviation of observed values from the regression line. Additionally, the Durbin-Watson statistic of 1.928 suggests that autocorrelation in the residuals is minimal, implying that the model does not suffer from significant serial correlation issues.

Table 2: Model Summary of the Relationship Between the Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.828[a]	.686	.682	.415	1.928

a. Predictors: (Constant), Digital Payment Solutions, USSD Banking Services, Internet Banking Platforms, Mobile Banking Applications
b. Dependent Variable: Service Quality

Source; Field Survey, 2024

Table 3 presents the ANOVA results, which assess the overall significance of the model. The regression sum of squares (135.672) is substantially higher than the residual sum of squares (62.169), indicating that the model accounts for most of the variance in service quality. The F-statistic of 196.953 is highly significant ($p = 0.000$), confirming that the independent variables—mobile banking applications, internet banking platforms, USSD banking services, and digital payment solutions—jointly have a statistically significant impact on service quality. This strong significance level ($p < 0.05$) validates the effectiveness of the model in explaining variations in service quality within the banking sector.

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Table 3: ANOVA of the Relationship Between the Variables

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	135.672	4	33.918	196.953	.000[b]
	Residual	62.169	361	.172		
	Total	197.841	365			

a. Dependent Variable: Service Quality
b. Predictors: (Constant), Digital Payment Solutions, USSD Banking Services, Internet Banking Platforms, Mobile Banking Applications

Source; Field Survey, 2024

Table 4 presents the coefficients of the regression model, detailing the individual contributions of each independent variable to service quality. Mobile banking applications have the highest positive impact (B = 0.607, p = 0.000), followed by USSD banking services (B = 0.201, p = 0.000), internet banking platforms (B = 0.173, p = 0.000), and digital payment solutions (B = 0.105, p = 0.000). The standardized beta coefficients further confirm that mobile banking applications exert the strongest influence on service quality (β = 0.629), while digital payment solutions have the least impact (β = 0.136). The Variance Inflation Factor (VIF) values, all below 2, indicate no significant multicollinearity among the predictors, confirming the reliability of the model. These results highlight the critical role of digital financial services in enhancing service quality in Nigeria's commercial banking sector.

Table 4: Coefficients of the Relationship Between the Variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.538	.143		3.752	.000		
	Mobile Banking Applications	.607	.037	.629	16.323	.000	.586	1.707
	Internet Banking Platforms	.173	.026	.215	6.540	.000	.804	1.243
	USSD Banking Services	.201	.026	.261	7.742	.000	.767	1.304
	Digital Payment Solutions	.105	.028	.136	3.822	.000	.685	1.460

a. Dependent Variable: Service Quality

Source; Field Survey, 2024

DISCUSSION

The coefficients in Table 4 provide crucial insights into the relationship between various digital banking services and service quality. The significant values across all independent variables suggest a strong positive influence of digital banking innovations on service quality. Mobile banking applications exhibit the highest impact, indicating that they have the most substantial influence on service quality. This finding aligns with previous studies that emphasize the convenience and efficiency of mobile banking applications in enhancing customer satisfaction and banking service accessibility (Komandla, 2018). Mobile banking applications offer seamless transactions, real-time updates, and personalized financial management tools, making them a crucial determinant of service quality in the digital banking ecosystem (Chigori et al., 2020).

Internet banking platforms also show a significant impact on service quality. While its influence is lower than that of mobile banking, it remains a vital component of digital financial services. Prior research has demonstrated that Internet banking enhances customer experience by providing 24/7 banking access, reducing the need for physical branch visits, and streamlining banking operations (Ezechi, 2025). However, usability concerns and cybersecurity risks have been cited as potential barriers to maximizing its full potential in service quality improvement (Hasan et al., 2025). The lower impact of Internet banking compared to mobile banking suggests that customers may prefer mobile-based solutions due to their ease of use and portability.

USSD banking services demonstrate a moderate impact on service quality. This result highlights the relevance of USSD technology, particularly in regions with limited internet connectivity. Empirical studies have shown that USSD banking provides a cost-effective and accessible alternative for conducting financial transactions, especially among users in rural areas and those with basic mobile phones (Musa & Al-Sammarraie, 2024). Despite its advantages, some studies have noted security vulnerabilities and transaction limits as drawbacks that could affect its overall contribution to service quality (Mwiya et al., 2021). Nonetheless, its significance in promoting financial inclusion and bridging the digital divide remains undisputed.

Digital payment solutions, including mobile wallets and contactless payment systems, have the least impact on service quality. Although their contribution is statistically significant, their relatively lower influence suggests that other digital banking services play a more dominant role in enhancing service quality. Prior literature has indicated that digital payment adoption is often hindered by infrastructure challenges, security concerns, and varying levels of consumer trust (Putrevu & Mertzanis, 2024). However, the growing preference for cashless transactions and the increasing adoption of fintech innovations indicate that digital payment solutions will likely become more influential in the future. Therefore, the findings corroborate existing empirical studies that highlight the transformative role of digital banking services in improving service quality and customer experience.

CONCLUSION AND RECOMMENDATIONS

In conclusion, digital banking services significantly contribute to improving service quality, with mobile banking applications being the most influential. Internet banking and USSD services also play vital roles, particularly in enhancing accessibility and bridging the digital divide. While digital payment solutions currently have a lesser impact, their potential for growth in the future remains promising. These findings underscore the importance of continued innovation and adaptation in the digital banking sector to meet evolving consumer demands and technological advancements.

Based on these findings, financial institutions should prioritize the expansion and enhancement of mobile banking services to maximize their impact on service quality. Additionally, efforts should be made to strengthen cybersecurity and usability features in Internet banking platforms to improve customer trust and engagement. USSD banking services should be further optimized to support financial inclusion in areas with limited internet access. Lastly, promoting awareness and infrastructure development for digital payment solutions can facilitate their wider adoption and contribution to service quality enhancement.

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