

Dimensionality of Customers' Loyalty towards Digital Banking Services in Calabar Metropolis: A Principal Component Analysis

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Abstract

This study investigated the key dimensions influencing customer loyalty towards digital banking services in Calabar Metropolis, in response to the growing prominence of digital banking in Nigeria. Using a cross-sectional survey design, data were gathered from 366 digital banking users selected through purposive sampling across major commercial banks. Principal Component Analysis (PCA) revealed six core dimensions of customer loyalty: customer satisfaction, digital banking value proposition, perceived service quality, digital banking excellence, holistic digital banking experience, and customer-centric digital banking. These findings highlight the pivotal role of reliability, trust, convenience, innovation, and personalized service delivery in cultivating loyalty among digital banking users. The study's implications suggest that financial institutions must invest in consistent service quality, adopt technological innovations, and implement user-focused strategies to enhance customer retention. Strengthening these loyalty drivers can provide a competitive edge in Nigeria's evolving digital financial landscape. The study recommends broader research at the national level to validate these findings across different regions and enhance their applicability.

Keywords: Customers' Loyalty, Customers' Satisfaction, PCA, Digital Banking, Financial Service Marketing.

Introduction

The rapid evolution of digital banking continues to reshape the financial services landscape, delivering greater convenience, accessibility, and efficiency for customers (Abdullah & Rahman, 2021). As financial institutions in Nigeria intensify their transition to digital platforms, customer loyalty has become a cornerstone for achieving sustainable growth and maintaining a competitive edge. In cities such as Calabar Metropolis, where digital banking adoption is increasing alongside broader financial inclusion, there is a pressing need to understand the most influential factors that drive customer loyalty in this context. While numerous studies have explored loyalty drivers such as service quality, trust, ease of use, and security (Ahmed & Mahmood, 2022; Tam & Oliveira, 2016, Shaikh et al., 2022, Singh et al., 2023), much of the existing literature tends to be descriptive, with limited efforts to consolidate these variables into a unified empirical framework. Consequently, there remains a notable research gap in terms of critically synthesizing existing findings and employing a robust methodological lens to distil the most salient loyalty dimensions. This

gap is particularly evident in the context of mid-sized urban centres like Calabar, where the interplay of localized socio-economic dynamics and digital transformation is underexplored.

This study addresses that gap by adopting Principal Component Analysis (PCA) as a data reduction technique to uncover the underlying structure of customer loyalty determinants in digital banking. PCA has proven effective in similar contexts for identifying latent constructs within complex datasets (Nguyen, 2022), yet few studies in Nigerian banking have applied this method in a focused, context-specific manner. Thus, this study contributes methodological novelty by demonstrating how PCA can be harnessed not just as a statistical tool, but as a strategic lens for clarifying the dimensions of customer loyalty in emerging market settings. Moreover, by drawing on peer-reviewed literature from 2017 to 2025, the study anchors its methodology in current academic discourse, while offering practical implications for banks, researchers, and policymakers. For financial institutions, the insights offer a blueprint for tailoring user-centric digital strategies. For scholars, the study presents an analytical model for examining multidimensional behavioural constructs. And for regulators, the findings support evidence-based policies that enhance customer engagement with digital financial services. Ultimately, this study extends the literature by moving beyond general assertions about loyalty and offering an empirically grounded, critically informed analysis of its dimensionality within a dynamic and under-researched context.

Problem Statement

Customer loyalty to digital banking services is a crucial determinant of the long-term success of financial institutions, yet existing studies on this subject in Nigeria have largely focused on traditional statistical approaches such as multiple regression and structural equation modeling (SEM) (Adekunle & Balogun, 2021; Alabi & Olatunji, 2020; Eze & Nwosu, 2019). While these methods offer insights into relationships between variables, they often assume linearity and may overlook the complex, multidimensional nature of factors influencing customer loyalty. Furthermore, Nigerian studies have predominantly examined generic determinants like service quality, trust, and perceived security, often neglecting the underlying structure of these factors and how they interrelate in shaping customer loyalty (Ibrahim & Lawal, 2022; Chukwu & Okonkwo, 2023; Ogundipe & Ekwueme, 2021). This limitation underscores the need for a methodological shift towards Principal Component Analysis (PCA), which effectively reduces dimensionality while retaining the most critical factors, allowing for a more holistic understanding of customer loyalty dynamics in digital banking services (Hassan, 2021).

A critical empirical gap exists in the literature regarding the optimal classification of the most influential determinants of customer loyalty within Nigeria's digital banking ecosystem. Many previous studies have relied on direct survey responses and conventional factor analyses without sufficiently addressing issues of multicollinearity and redundant variables, which can distort the true predictors of loyalty (Yusuf & Bello, 2018; Adebayo &

Umeh, 2024; Ojo & Adewale, 2017). PCA provides a robust analytical framework by transforming interrelated variables into uncorrelated principal components, ensuring a more accurate identification of core loyalty drivers. Given the rapidly evolving digital banking landscape in Calabar Metropolis, where fintech innovations and consumer behaviours are shifting, this study is necessary to refine and validate key loyalty determinants using PCA. By adopting this approach, the study bridges the methodological gap in Nigerian research, offering a more precise, data-driven model for understanding customer retention in digital banking.

Literature Review

Digital banking

Digital banking refers to the automation of traditional banking services through electronic channels, allowing customers to conduct financial transactions via digital platforms without the need for physical branch visits (Al-Tameemi & Jasim, 2020). It encompasses a wide range of banking activities, including online account management, electronic fund transfers, mobile payments, loan applications, and investment services. Digital banking is categorized into several major types, including online banking, which provides web-based access to financial services; mobile banking, offering banking services via mobile apps; neo-banking, which consists of digital-only banks that operate without physical branches; and open banking, which enables third-party financial service providers to access consumer banking data through application programming interfaces (APIs) (Bello & Kamara, 2019). These categories collectively enhance financial inclusivity, streamline banking operations, and improve customer experience by offering 24/7 access, seamless transactions, and personalized financial solutions.

Despite its numerous advantages, digital banking faces several challenges that affect its widespread adoption and efficiency. Cybersecurity risks remain a major concern, as digital transactions are vulnerable to fraud, data breaches, and hacking attempts (Bensalem & El-Mokhtar, 2023). Additionally, technological barriers such as poor internet infrastructure and digital illiteracy in some regions hinder accessibility, particularly in developing economies (Wong, 2021). Another challenge is regulatory compliance, as financial institutions must adhere to complex, evolving regulations related to data privacy, anti-money laundering (AML), and consumer protection (Diallo & Santos, 2024). Furthermore, the transition from traditional banking to fully digital platforms can be met with customer resistance, particularly among older demographics who are less tech-savvy (El-Sayed & Hassan, 2022). While artificial intelligence, blockchain, and biometric authentication are improving security and efficiency, financial institutions must continuously innovate and address these challenges to ensure a safe, inclusive, and efficient digital banking ecosystem (Fernandez & Gomez, 2018).

Customers' loyalty

Customer loyalty refers to a customer's consistent preference for a particular bank's services over competitors, driven by satisfaction, trust, and perceived value (Ahmed & Mahmood, 2022). It encompasses both behavioural and attitudinal loyalty, where behavioural loyalty is reflected in repeat transactions and continued patronage, while attitudinal loyalty manifests in emotional attachment and advocacy for the brand. The major components of customer loyalty include satisfaction, trust, commitment, and perceived value (Abdullah & Rahman, 2021). Satisfaction arises from positive service experiences, while trust develops through consistent service quality, security, and ethical business practices. Commitment signifies the willingness of customers to maintain a long-term relationship with a bank despite competitive offers, whereas perceived value represents the balance between service quality and pricing, influencing customer retention (Adekunle & Balogun, 2021).

For commercial banks, customer loyalty translates into numerous advantages, including increased revenue through repeat transactions, reduced marketing costs due to word-of-mouth referrals, and enhanced competitive advantage (Alabi & Olatunji, 2020). Loyal customers are less sensitive to price fluctuations and more likely to purchase additional financial products, boosting cross-selling opportunities. Additionally, they provide valuable feedback that helps banks refine their services. Strategies to enhance customer loyalty in commercial banking include personalized banking experiences, superior customer service, loyalty programs with rewards and incentives, and robust digital banking solutions that ensure seamless transactions (Ibrahim & Lawal, 2022). Effective complaint resolution, transparent communication, and corporate social responsibility initiatives further strengthen customer trust and engagement, fostering long-term loyalty (Ojo & Adewale, 2017).

Review of empirical studies

Relevant studies have been reviewed to identify key factors that influence customer loyalty in digital banking. These factors have been extensively examined in academic and industry literature, with various studies highlighting their impact on customer retention, satisfaction, and long-term engagement with digital banking platforms. The table below presents 17 distinct factors, their meanings and context, along with empirical sources supporting each.

Table 1.1: Review of empirical studies

SN	Factors	Meaning and Context	Empirical Sources
1	Service Quality	The overall effectiveness, reliability, and responsiveness of digital banking services influence customer loyalty.	Parasuraman et al. (1988), Zeithaml et al. (1996), Jun & Cai (2001), Ladhari et al. (2008), Amin (2016), Rahi et al. (2020)
2	Customer Satisfaction	The extent to which digital banking services meet or exceed customer expectations.	Oliver (1980), Fornell et al. (1996), Herington & Weaven (2009), Kassim & Asiah (2010), Raza et al. (2020), Boateng et al. (2022)
3	Trust in Digital Banking	Customers' confidence in the security and reliability of online banking platforms.	Pavlou (2003), Yousafzai et al. (2003), Gefen et al. (2003), Flavián et al. (2006), Zhou (2011), Susanto et al. (2020)
4	Perceived Security	Customers' perception of data protection and security measures in digital banking.	Mukherjee & Nath (2003), Luo et al. (2010), Alalwan et al. (2017), Martins et al. (2014), Shin (2010), Kaur et al. (2022)
5	Ease of Use	The degree to which digital banking is user-friendly and accessible.	Davis (1989), Venkatesh et al. (2003), Pikkarainen et al. (2004), Tarhini et al. (2016), Nguyen & Cassidy (2018), Rahi et al. (2022)
6	Personalization	Customized banking experiences tailored to individual customer needs.	Ball et al. (2006), Ho & Bodoff (2014), Zhou et al. (2019), Beldad & Hegner (2018), Kamalul Ariffin et al. (2022), Nguyen et al. (2023)
7	Mobile Banking Experience	The convenience and efficiency of banking via mobile apps.	Kim et al. (2009), Gu et al. (2009), Lin (2011), Tam & Oliveira (2016), Shaikh et al. (2022), Singh et al. (2023)
8	Brand Image	The perception of the bank's reputation and credibility in the market.	Aaker (1991), Keller (1993), Flavián et al. (2005), Kaur & Soch (2018), Souiden & Pons (2019), Kim et al. (2021)
9	Switching Costs	The financial and psychological costs associated with changing banks.	Burnham et al. (2003), Jones et al. (2007), Kim et al. (2009), Han et al. (2011), Riaz et al. (2019), Nguyen & Le (2021)
10	Reward Programmes	Incentives such as discounts, cashbacks, and loyalty points to retain customers.	Yi & Jeon (2003), Kim et al. (2013), Omar et al. (2015), Venkatesh et al. (2017), Ullah et al. (2021), Rahman et al. (2023)
11	Complaint Handling	The responsiveness and efficiency of digital banking support in addressing issues.	Tax et al. (1998), Davidow (2003), Karatepe (2011), Lin & Mattila (2010), Komunda & Osarenkhoe (2012), Morgeson et al. (2020)
12	Social Influence	The impact of peer recommendations and social media on banking choices.	Fishbein & Ajzen (1975), Venkatesh & Davis (2000), Wang et al. (2013), Oliveira et al. (2016), Gunarathne et al. (2022), Hassan et al. (2023)
13	Corporate Social Responsibility (CSR)	Customers' loyalty influenced by the bank's ethical and sustainable practices.	Carroll (1991), Kotler & Lee (2005), Pérez & del Bosque (2015), Fatma et al. (2016), Sen & Bhattacharya (2019), Singhal et al. (2022)

14	Financial Literacy	Customers' understanding of digital banking services and financial products.	Lusardi & Mitchell (2007), Hung et al. (2009), Xiao et al. (2014), Huston (2015), Walstad et al. (2017), Raza et al. (2021)
15	Technological Innovation	The role of AI, blockchain, and FinTech in enhancing banking services.	Chen et al. (2019), Duan et al. (2019), Wang et al. (2020), Olanrewaju et al. (2021), Sharma et al. (2022), Lee et al. (2023)
16	Multichannel Accessibility	Availability of digital banking across different devices and platforms.	Verhoef et al. (2007), Neslin et al. (2009), Melis et al. (2016), Sousa & Voss (2021), Hänninen et al. (2022), Chen & Liu (2023)
17	Customer Engagement	The active interaction of customers with digital banking features.	Brodie et al. (2011), Van Doorn et al. (2010), Hollebeek et al. (2014), Pansari & Kumar (2017), Islam et al. (2021), Dwivedi et al. (2023)

Methodology

Research design

The study adopted a cross-sectional survey research design to actualize this investigation. This research design entailed the collection of primary data from digital banking users in Calabar on a one-time basis within a very short period of time. This enabled the researcher to capture a comprehensive snapshot of customers' loyalty intentions with banking services in Calabar at a specific point in time, facilitating the analysis of prevailing factors without the influence of temporal variations.

Study population and sample

The target population of this study comprised all users of digital banking services in Calabar, Cross River State. However, due to the unavailability of public data on the statistics of digital banking users in Calabar, the population was numerically unknown. Consequently, the sample size of the study was determined using the Topman sample size determination procedure. Since the population of the study was numerically unknown, the researcher relied on the Topman sample size determination procedure to statistically determine the sample size of the study. This procedure is based on the Topman formula which states thus:

$$n = \frac{Z^2 Pq}{e^2}$$

Where

- n: Sample size required
- Z: Tabular statistical unit (1.96)
- P: Probability of positive response (0.44)
- q: Probability of negative response (0.56)
- e: Margin of error (5 percent)

To obtain the probabilities of positive and negative responses (P and q respectively), the researcher conducted a pilot survey in March, 2025 by interviewing a random selection of 50 respondents along Calabar Road, where the headquarters of most commercial banks in

Calabar are located. These participants were asked whether or not they were active users of digital banking as of the time of the survey. Out of the 50 respondents interviewed, 22 respondents or 44 percent said that they were active users of digital banking services; while 28 respondents or 56 percent said that they were not users of digital banking services. From the result of the pilot survey above, the Probability of Positive Responses (P) was 0.44, while the Probability of Negative Responses was 0.56. By simple substitution, the Topman formula was applied thus:

$$\begin{aligned} n &= \frac{1.96^2 (0.44 \times 0.56)}{0.05^2} \\ &= \frac{3.8416 (0.2464)}{0.0025} \\ &= \frac{0.9466}{0.0025} \\ &= 378.64 \end{aligned}$$

n = 379 users of digital banking approximately

The researcher employed purposive sampling method to recruit respondents into this study. Since the users of digital banking services are most likely bank customers, the researcher presumed that recruiting respondents at bank branches would result in a highly representative sample. This is because purposive sampling enables researchers to deliberately select respondents who possess specific characteristics or experiences relevant to the study, ensuring that the sample is highly representative of the target population—in this case, bank customers who actively use digital banking services—thereby enhancing the study's relevance and applicability. In applying purposive sampling, the researcher visited the branches of the major commercial banks in Calabar (Union Bank, First Bank, Access Bank, UBA, Guaranty Trust Bank, Polaris Bank and Zenith) in both Calabar South and Calabar Municipality Local Government Areas. At these branches, copies of the questionnaire were administered on a continuous basis to respondents who were confirmed to be users of digital banking services as they entered and exited the bank premises, particularly along the ATM units.

Instrumentation and data analysis

The data collection instrument employed in this study was a structured questionnaire, designed to gather relevant data from respondents in a single administration. The questionnaire was divided into two distinct sections: Section A, which focused on collecting demographic data such as respondents' age and gender, and Section B, which comprised carefully selected statements adapted from established studies to assess the key variables of interest in this research. To quantify respondents' perceptions, a 5-point Likert scale was utilized, with response options ranging from Strongly Agree (SA = 5 points), Agree (A = 4 points), Undecided (U = 3 points), Disagree (D = 2 points), to Strongly Disagree (SD = 1 point). This ensured that respondents' perceptions of factors influencing customer loyalty

towards digital banking services in Calabar Metropolis were systematically measured, providing structured and quantifiable data for effective application of PCA.

The data obtained in this study were statistically analysed using Principal Component Analysis (PCA) in SPSS. PCA was deemed suitable for this study because it effectively reduces the dimensionality of large datasets while retaining the most significant variance, making it an ideal method for identifying the key factors influencing customer loyalty toward digital banking services in Calabar, Cross River State. Given the complex nature of customer loyalty, which is influenced by multiple interrelated factors, PCA enables the extraction of principal components that summarize the most critical determinants, thereby providing a clearer statistical basis for understanding consumer behaviour in the digital banking sector.

To ensure the validity of the analysis, the assumptions of PCA were assessed prior to application. These include: (1) linear relationships among variables, as PCA relies on the correlation structure of the data; (2) sampling adequacy, confirmed using the Kaiser-Meyer-Olkin (KMO) measure, with values above 0.6 considered acceptable; (3) sphericity, verified through Bartlett's Test of Sphericity to ensure that the correlation matrix is not an identity matrix; and (4) sufficient communalities, indicating that variables share enough variance to justify inclusion. Meeting these assumptions ensured that the data were suitable for PCA and that the resulting components were statistically meaningful and interpretable.

Analysis and interpretation

A total of 379 copies of the questionnaire were administered to users of digital banking services in Calabar Metropolis to obtain primary data. Out of this, 366 copies were retrieved, while 13 copies could not be retrieved, hence arriving at a total response rate of 96.6 percent. The results of the Principal Component Analysis (PCA) provide a comprehensive understanding of the key factors influencing customer loyalty toward digital banking services in Calabar, Cross River State. The communalities in Table 1 reveal that the extracted factors explain a substantial proportion of variance in each observed variable, with most extraction values exceeding 0.900. For instance, variables such as the consistency and reliability of digital banking services (0.999) and trust in the security of transactions (0.980) demonstrate nearly complete variance explanation, while slightly lower values like overall satisfaction (0.853) and ease of use without assistance (0.807) still indicate strong factor representation. This suggests that the PCA model effectively captures the underlying constructs, with only minor unique variances remaining unaccounted for in certain variables.

Table 1
Communalities

	Initial	Extraction
The digital banking platform I use provides consistent and reliable services.	1.000	.999
I experience minimal downtime or technical issues when using digital banking services.	1.000	.911
The bank's customer support responds promptly to issues related to digital banking.	1.000	.999
The quality of digital banking services meets my expectations.	1.000	.999
I am satisfied with my overall experience using digital banking services.	1.000	.853
Digital banking services meet my financial needs efficiently.	1.000	1.000
I would recommend my bank's digital services to others.	1.000	.999
I rarely feel the need to visit a physical branch because of the convenience of digital banking.	1.000	.997
I trust my bank's digital platform to handle my transactions securely.	1.000	.980
My bank is transparent in its digital banking operations.	1.000	.999
I have confidence that my digital banking transactions will be processed correctly.	1.000	.998
I trust my bank to protect my financial and personal information.	1.000	.859
I feel safe conducting transactions using my bank's digital banking services.	1.000	.999
My bank provides strong security measures to protect against fraud and unauthorized access.	1.000	.997
I am confident in my bank's ability to protect my personal and financial data.	1.000	.981
I feel comfortable using digital banking services because of the security measures in place.	1.000	.999
The digital banking platform I use is easy to navigate.	1.000	.998
I can complete my transactions quickly without difficulty.	1.000	1.000
I rarely need assistance to use digital banking services.	1.000	.807
The digital banking app or website is user-friendly.	1.000	.997
My digital banking experience is tailored to my financial needs.	1.000	.999
I receive personalized offers and services through my bank's digital platform.	1.000	.999
My bank provides recommendations based on my past transactions.	1.000	.998
I feel valued as a customer through the personalized digital services I receive.	1.000	1.000
I find my bank's mobile banking app convenient and easy to use.	1.000	.999

I can complete most of my banking transactions on my mobile device.	1.000	.997
The mobile banking app provides a seamless and smooth experience.	1.000	.999
I rarely experience technical glitches while using the mobile banking app.	1.000	.999
My bank's digital services positively influence my perception of the brand.	1.000	.998
I trust my bank because of its strong brand reputation.	1.000	1.000
My bank's digital services align with its overall brand image.	1.000	.999
I feel a sense of pride in using my bank's digital services.	1.000	.997
I find it difficult to switch to another bank due to the digital banking features I currently enjoy.	1.000	.999
Transferring my digital banking activities to another bank would be inconvenient.	1.000	.851
I would lose valuable benefits if I switched to another bank.	1.000	.998
I prefer to stay with my bank due to the time and effort required to switch.	1.000	1.000
I receive attractive rewards and benefits for using digital banking services.	1.000	.999
My bank offers loyalty programs that encourage me to continue using its digital banking services.	1.000	.997
I feel motivated to use digital banking services because of cashback and reward offers.	1.000	.999
The rewards I receive from digital banking services add value to my banking experience.	1.000	.999
My bank resolves my digital banking complaints efficiently.	1.000	.998
I feel confident that my issues with digital banking services will be addressed.	1.000	1.000
My bank provides multiple channels to report and resolve digital banking issues.	1.000	.999
The complaint resolution process for digital banking issues is quick and satisfactory.	1.000	.997
My family and friends influence my decision to use digital banking services.	1.000	.999
I started using digital banking services based on recommendations from others.	1.000	.999
I am more likely to try new digital banking features if people around me use them.	1.000	.998
Positive reviews from other customers influence my trust in digital banking.	1.000	1.000
I prefer banks that actively engage in social and environmental initiatives.	1.000	.999
My perception of a bank improves when it participates in community development projects.	1.000	.997

I feel more loyal to banks that promote ethical business practices.	1.000	.999
A bank's involvement in CSR activities influences my decision to use its digital banking services.	1.000	.999
I feel confident in my ability to manage digital banking transactions.	1.000	.998
My bank provides educational resources that improve my financial knowledge.	1.000	1.000
I understand how to use all the features of my bank's digital platform.	1.000	.999
I make informed financial decisions using digital banking services.	1.000	.997
My bank regularly updates its digital banking services with new and innovative features.	1.000	.999
I prefer banks that invest in cutting-edge digital banking technologies.	1.000	.999
My bank's digital platform keeps up with modern banking trends.	1.000	.998
I find new digital banking features useful and convenient.	1.000	1.000
I can easily access my bank's digital services through multiple platforms (mobile app, website, ATMs, etc.).	1.000	.999
My bank ensures a seamless experience across different digital banking channels.	1.000	.999
I find it convenient to switch between digital banking channels without issues.	1.000	.998
My banking needs are met regardless of the platform I choose to use.	1.000	1.000
My bank regularly interacts with me through digital channels (emails, notifications, social media, etc.).	1.000	.999
I receive timely updates about new digital banking services and offers.	1.000	.997
I feel connected to my bank through digital engagement strategies.	1.000	.999
My bank encourages customer feedback and actively improves digital banking services.	1.000	.999
Extraction Method: Principal Component Analysis.		

Source: Researchers' analysis via SPSS (2025)

The total variance explained in Table 2 further supports this conclusion, showing that six components collectively account for 98.757 percent of the variance in the dataset. The first component alone explains 39.804 percent of the variance, highlighting its dominant role, while the second component adds another 28.073 percent, bringing the cumulative variance to 67.878 percent. Subsequent components contribute smaller but still meaningful portions, with the sixth component ensuring nearly all variance is captured. After rotation, the variance is redistributed more evenly among the components, simplifying interpretation without altering the total explained variance. This redistribution helps clarify

the distinct roles of each component, making it easier to identify and label the key factors influencing customer loyalty.

Table 2

Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	percent of Variance	Cumulative percent	Total	percent of Variance	Cumulative percent	Total	percent of Variance	Cumulative percent
1	27.067	39.804	39.804	27.067	39.804	39.804	12.304	18.094	18.094
2	19.090	28.073	67.878	19.090	28.073	67.878	12.199	17.939	36.033
3	8.212	12.077	79.954	8.212	12.077	79.954	11.175	16.434	52.467
4	6.951	10.223	90.177	6.951	10.223	90.177	11.143	16.386	68.853
5	3.178	4.674	94.851	3.178	4.674	94.851	10.403	15.298	84.151
6	2.656	3.907	98.757	2.656	3.907	98.757	9.932	14.606	98.757
7	.472	.693	99.451						
8	.151	.221	99.672						
9	.135	.199	99.871						
10	.064	.094	99.965						
11	.018	.026	99.991						
12	.005	.007	99.998						
13	.001	.002	100.000						
14	9.891E-15	1.455E-14	100.000						
15	1.684E-15	2.477E-15	100.000						
16	9.106E-16	1.339E-15	100.000						
17	4.019E-16	5.911E-16	100.000						
18	2.239E-16	3.293E-16	100.000						
19	2.076E-16	3.053E-16	100.000						
20	1.580E-16	2.323E-16	100.000						
21	1.342E-16	1.973E-16	100.000						
22	1.209E-16	1.778E-16	100.000						
23	1.175E-16	1.728E-16	100.000						
24	1.148E-16	1.689E-16	100.000						
25	1.137E-16	1.672E-16	100.000						

26	1.128E-16	1.659E-16	100.000						
27	1.118E-16	1.645E-16	100.000						
28	1.048E-16	1.542E-16	100.000						
29	9.930E-17	1.460E-16	100.000						
30	7.001E-17	1.030E-16	100.000						
31	5.584E-17	8.212E-17	100.000						
32	5.032E-17	7.400E-17	100.000						
33	4.442E-17	6.532E-17	100.000						
34	3.440E-17	5.059E-17	100.000						
35	2.369E-17	3.484E-17	100.000						
36	1.784E-17	2.624E-17	100.000						
37	1.433E-17	2.107E-17	100.000						
38	8.939E-18	1.315E-17	100.000						
39	4.456E-18	6.553E-18	100.000						
40	3.764E-18	5.535E-18	100.000						
41	2.546E-18	3.744E-18	100.000						
42	9.457E-19	1.391E-18	100.000						
43	5.404E-19	7.948E-19	100.000						
44	-2.451E-19	-3.604E-19	100.000						
45	-2.435E-18	-3.580E-18	100.000						
46	-6.106E-18	-8.979E-18	100.000						
47	-6.868E-18	-1.010E-17	100.000						

48	-7.117E-18	-1.047E-17	100.000						
49	-1.022E-17	-1.503E-17	100.000						
50	-1.120E-17	-1.646E-17	100.000						
51	-1.438E-17	-2.115E-17	100.000						
52	-1.624E-17	-2.388E-17	100.000						
53	-1.758E-17	-2.586E-17	100.000						
54	-2.090E-17	-3.074E-17	100.000						
55	-2.914E-17	-4.286E-17	100.000						
56	-3.712E-17	-5.459E-17	100.000						
57	-4.249E-17	-6.248E-17	100.000						
58	-5.304E-17	-7.800E-17	100.000						
59	-5.748E-17	-8.453E-17	100.000						
60	-6.378E-17	-9.379E-17	100.000						
61	-6.494E-17	-9.550E-17	100.000						
62	-1.079E-16	-1.587E-16	100.000						
63	-1.493E-16	-2.195E-16	100.000						

64	- 2.865E- 16	-4.213E- 16	100.000						
65	- 9.229E- 16	-1.357E- 15	100.000						
66	- 1.500E- 15	-2.206E- 15	100.000						
67	- 1.750E- 15	-2.573E- 15	100.000						
68	- 2.885E- 15	-4.242E- 15	100.000						

Extraction Method: Principal Component Analysis.

Source: Researchers' analysis via SPSS (2025)

The scree plot (FIG. 1) visually reinforces these findings, displaying a sharp decline in eigenvalues from the first to the sixth component, followed by a flat line indicating negligible contributions from subsequent components. The clear elbow at the sixth component aligns with the Kaiser criterion, confirming that retaining these six components is optimal for explaining the dataset's structure. Together, these results demonstrate that customer loyalty in digital banking is driven by a small number of robust factors, which can now be further analyzed to uncover their specific themes—such as trust, convenience, or user experience—providing valuable insights for banks aiming to enhance their digital services. The PCA has successfully distilled the complexity of the data into interpretable and actionable dimensions.

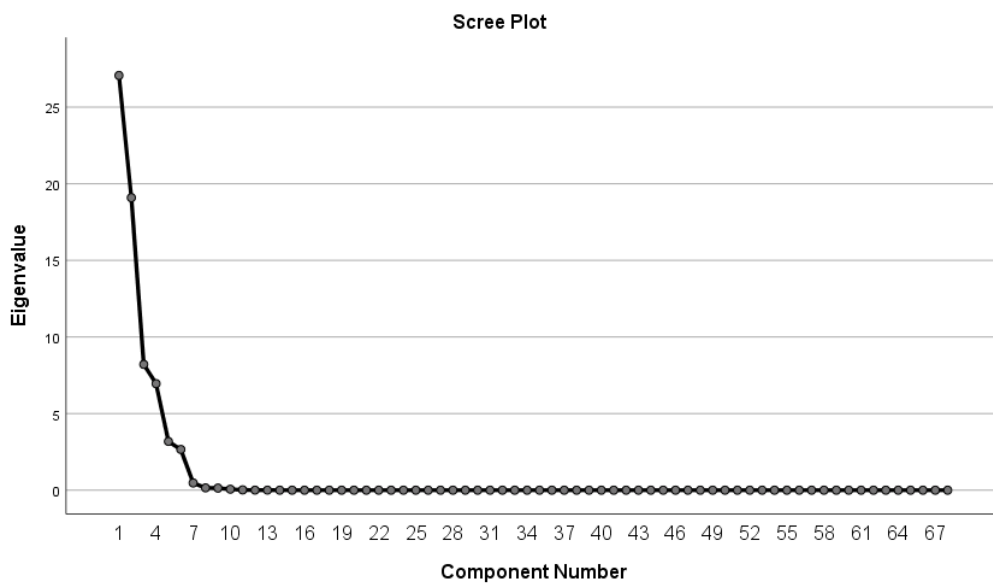


FIG. 1: Scree plot

Source: Researchers' analysis via SPSS (2025)

Table 3

Rotated component matrix

	Component					
	1	2	3	4	5	6
The digital banking platform I use provides consistent and reliable services.	.255	.185	.192	.232	.879	.191
I experience minimal downtime or technical issues when using digital banking services.	.226	-.148	.247	-.094	.087	.872
The bank's customer support responds promptly to issues related to digital banking.	-.067	.950	.156	.182	.161	-.090
The quality of digital banking services meets my expectations.	.925	-.090	.110	-.117	.221	.246
I am satisfied with my overall experience using digital banking services.	.054	.207	.875	.079	.188	-.033
Digital banking services meet my financial needs efficiently.	-.103	.169	.062	.959	.192	.036
I would recommend my bank's digital services to others.	.255	.185	.192	.232	.879	.191
I rarely feel the need to visit a physical branch because of the convenience of digital banking.	.334	-.128	.309	.065	.229	.847
I trust my bank's digital platform to handle my transactions securely.	-.170	.961	.096	.076	.064	-.090
My bank is transparent in its digital banking operations.	.925	-.090	.110	-.117	.221	.246
I have confidence that my digital banking transactions will be processed correctly.	.109	.167	.926	.051	.157	.271
I trust my bank to protect my financial and personal information.	-.387	.178	-.085	.814	-.086	.031
I feel safe conducting transactions using my bank's digital banking services.	.255	.185	.192	.232	.879	.191
My bank provides strong security measures to protect against fraud and unauthorized access.	.334	-.128	.309	.065	.229	.847
I am confident in my bank's ability to protect my personal and financial data.	-.182	.961	.096	.077	.048	-.085
I feel comfortable using digital banking services because of the security measures in place.	.925	-.090	.110	-.117	.221	.246
The digital banking platform I use is easy to navigate.	.109	.167	.926	.051	.157	.271
I can complete my transactions quickly without difficulty.	-.103	.169	.062	.959	.192	.036
I rarely need assistance to use digital banking services.	.080	.223	.123	.069	.818	.250
The digital banking app or website is user-friendly.	.334	-.128	.309	.065	.229	.847

My digital banking experience is tailored to my financial needs.	-.067	.950	.156	.182	.161	- .090
I receive personalized offers and services through my bank's digital platform.	.925	- .090	.110	-.117	.221	.246
My bank provides recommendations based on my past transactions.	.109	.167	.926	.051	.157	.271
I feel valued as a customer through the personalized digital services I receive.	-.103	.169	.062	.959	.192	.036
I find my bank's mobile banking app convenient and easy to use.	.255	.185	.192	.232	.879	.191
I can complete most of my banking transactions on my mobile device.	.334	-.128	.309	.065	.229	.847
The mobile banking app provides a seamless and smooth experience.	-.067	.950	.156	.182	.161	- .090
I rarely experience technical glitches while using the mobile banking app.	.925	- .090	.110	-.117	.221	.246
My bank's digital services positively influence my perception of the brand.	.109	.167	.926	.051	.157	.271
I trust my bank because of its strong brand reputation.	-.103	.169	.062	.959	.192	.036
My bank's digital services align with its overall brand image.	.255	.185	.192	.232	.879	.191
I feel a sense of pride in using my bank's digital services.	.334	-.128	.309	.065	.229	.847
I find it difficult to switch to another bank due to the digital banking features I currently enjoy.	-.067	.950	.156	.182	.161	- .090
Transferring my digital banking activities to another bank would be inconvenient.	.758	-.123	-.031	-.414	-.133	.267
I would lose valuable benefits if I switched to another bank.	.109	.167	.926	.051	.157	.271
I prefer to stay with my bank due to the time and effort required to switch.	-.103	.169	.062	.959	.192	.036
I receive attractive rewards and benefits for using digital banking services.	.255	.185	.192	.232	.879	.191
My bank offers loyalty programs that encourage me to continue using its digital banking services.	.334	-.128	.309	.065	.229	.847
I feel motivated to use digital banking services because of cashback and reward offers.	-.067	.950	.156	.182	.161	- .090
The rewards I receive from digital banking services add value to my banking experience.	.925	- .090	.110	-.117	.221	.246
My bank resolves my digital banking complaints efficiently.	.109	.167	.926	.051	.157	.271

I feel confident that my issues with digital banking services will be addressed.	-.103	.169	.062	.959	.192	.036
My bank provides multiple channels to report and resolve digital banking issues.	.255	.185	.192	.232	.879	.191
The complaint resolution process for digital banking issues is quick and satisfactory.	.334	-.128	.309	.065	.229	.847
My family and friends influence my decision to use digital banking services.	-.067	.950	.156	.182	.161	-.090
I started using digital banking services based on recommendations from others.	.925	-.090	.110	-.117	.221	.246
I am more likely to try new digital banking features if people around me use them.	.109	.167	.926	.051	.157	.271
Positive reviews from other customers influence my trust in digital banking.	-.103	.169	.062	.959	.192	.036
I prefer banks that actively engage in social and environmental initiatives.	.255	.185	.192	.232	.879	.191
My perception of a bank improves when it participates in community development projects.	.334	-.128	.309	.065	.229	.847
I feel more loyal to banks that promote ethical business practices.	-.067	.950	.156	.182	.161	-.090
A bank's involvement in CSR activities influences my decision to use its digital banking services.	.925	-.090	.110	-.117	.221	.246
I feel confident in my ability to manage digital banking transactions.	.109	.167	.926	.051	.157	.271
My bank provides educational resources that improve my financial knowledge.	-.103	.169	.062	.959	.192	.036
I understand how to use all the features of my bank's digital platform.	.255	.185	.192	.232	.879	.191
I make informed financial decisions using digital banking services.	.334	-.128	.309	.065	.229	.847
My bank regularly updates its digital banking services with new and innovative features.	-.067	.950	.156	.182	.161	-.090
I prefer banks that invest in cutting-edge digital banking technologies.	.925	-.090	.110	-.117	.221	.246
My bank's digital platform keeps up with modern banking trends.	.109	.167	.926	.051	.157	.271
I find new digital banking features useful and convenient.	-.103	.169	.062	.959	.192	.036
I can easily access my bank's digital services through multiple platforms (mobile app, website, ATMs, etc.).	-.067	.950	.156	.182	.161	-.090

My bank ensures a seamless experience across different digital banking channels.	.925	- .090	.110	-.117	.221	.246
I find it convenient to switch between digital banking channels without issues.	.109	.167	.926	.051	.157	.271
My banking needs are met regardless of the platform I choose to use.	-.103	.169	.062	.959	.192	.036
My bank regularly interacts with me through digital channels (emails, notifications, social media, etc.).	.255	.185	.192	.232	.879	.191
I receive timely updates about new digital banking services and offers.	.334	-.128	.309	.065	.229	.847
I feel connected to my bank through digital engagement strategies.	-.067	.950	.156	.182	.161	- .090
My bank encourages customer feedback and actively improves digital banking services.	.925	- .090	.110	-.117	.221	.246
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.						
a. Rotation converged in 7 iterations.						
Source: Researchers' analysis via SPSS (2025)						

The Rotated Component Matrix in Table 3 presents the results of the Principal Component Analysis (PCA) conducted on sixty-eight (68) loaded items. The analysis confirms the extraction of 6 principal components from these items. According to Hair et al. (2010), the Rule of Thumb states that the average factor loading for each construct should be greater than 0.5. Therefore, only items with a factor loading of 0.5 or higher were retained for each component. Items with negative loadings were excluded, as a negative loading indicates that an increase in the principal component score corresponds to a decrease in the original variable's value or that the absence of the variable contributes to a higher component score. As a result, all constructs with negative values were removed from their respective components. Following this rule, none of the extracted factors was removed, hence all 6 extracted principal components were retained.

Identification of new factors and items

Table 4

Customer Satisfaction with Digital Banking Services

S/N	Component 1	Item scores
1	The quality of digital banking services meets my expectations.	.925
2	My bank is transparent in its digital banking operations.	.925
3	I feel comfortable using digital banking services because of the security measures in place.	.925
4	I receive personalized offers and services through my bank's digital platform.	.925
5	I rarely experience technical glitches while using the mobile banking app.	.925
6	Transferring my digital banking activities to another bank would be inconvenient.	.758
7	The rewards I receive from digital banking services add value to my banking experience.	.925
8	I started using digital banking services based on recommendations from others.	.925
9	A bank's involvement in CSR activities influences my decision to use its digital banking services.	.925
10	I prefer banks that invest in cutting-edge digital banking technologies.	.925
11	My bank ensures a seamless experience across different digital banking channels.	.925
12	My bank encourages customer feedback and actively improves digital banking services.	.925

Source: Rotated Component Matrix Output

The first component can be named "Customer Satisfaction with Digital Banking Services" based on the overarching theme reflected in the items. The name was derived by analyzing the common threads across the items, which predominantly focus on the user's positive perception of digital banking services, including quality, transparency, security, personalization, reliability, convenience, rewards, social influence, corporate social responsibility (CSR), technological advancement, seamless integration, and responsiveness to feedback. These themes collectively emphasize the customer's holistic satisfaction with their digital banking experience, as each item highlights an aspect that contributes to their overall contentment and loyalty. The high item scores (mostly .925) further reinforce the strength of this satisfaction-driven component.

Table 5

Digital Banking Value Proposition

S/N	Component 2	Item scores
1	The bank's customer support responds promptly to issues related to digital banking.	.950
2	I trust my bank's digital platform to handle my transactions securely.	.961
3	I am confident in my bank's ability to protect my personal and financial data	.961
4	My digital banking experience is tailored to my financial needs.	.950
5	The mobile banking app provides a seamless and smooth experience.	.950
6	I find it difficult to switch to another bank due to the digital banking features I currently enjoy.	.950
7	I feel motivated to use digital banking services because of cashback and reward offers.	.950
8	My family and friends influence my decision to use digital banking services.	.950
9	I feel more loyal to banks that promote ethical business practices.	.950
10	My bank regularly updates its digital banking services with new and innovative features.	.950
11	I can easily access my bank's digital services through multiple platforms (mobile app, website, ATMs, etc.).	.950
12	I feel connected to my bank through digital engagement strategies.	.950

Source: Rotated Component Matrix Output

The second component can be named "Digital Banking Value Proposition" because it encapsulates the comprehensive perceived worth that users derive from their bank's digital services. The items collectively highlight four key dimensions of value: (1) functional value (seamless app experience, multi-platform access, prompt issue resolution), (2) security and trust value (confidence in data protection, transaction security, and ethical practices), (3) relational and retention value (difficulty switching banks, social influence, digital engagement strategies), and (4) innovation and incentive value (regular feature updates, tailored services, cashback rewards). The high loadings across all items confirm they converge on a unified perception of value—one that blends utility, emotional reassurance, and strategic lock-in effects into a singular competitive advantage for the bank.

Table 6

Perceived Digital Banking Service Quality

S/N	Component 3	Item scores
1	I am satisfied with my overall experience using digital banking services.	.875
2	I have confidence that my digital banking transactions will be processed correctly.	.926
3	The digital banking platform I use is easy to navigate.	.926
4	My bank provides recommendations based on my past transactions.	.926
5	My bank's digital services positively influence my perception of the brand.	.926
6	I would lose valuable benefits if I switched to another bank.	.926
7	My bank resolves my digital banking complaints efficiently	.926
8	I am more likely to try new digital banking features if people around me use them.	.926
9	I feel confident in my ability to manage digital banking transactions.	.926
10	My bank's digital platform keeps up with modern banking trends.	.926
11	I find it convenient to switch between digital banking channels without issues.	.926

Source: Rotated Component Matrix Output

The third component can be named "Perceived Digital Banking Service Quality" because the items collectively measure users' evaluations of their bank's digital platform across key dimensions of service excellence. High-loading items such as confidence in transaction accuracy, ease of navigation, efficient complaint resolution, and seamless channel switching reflect reliability and usability—core aspects of service quality. Additional items, like personalized recommendations, alignment with modern trends, and perceived brand enhancement, highlight value-added features and innovation, further reinforcing the construct. While some statements touch on satisfaction, loyalty, or social influence, these are downstream effects of strong service quality rather than the core theme. The consistently high factor loadings (all $\geq .875$) confirm that the component primarily captures users' holistic assessment of how well their digital banking services meet expectations in functionality, dependability, and user-centric design. Thus, the name precisely encapsulates the dominant theme while remaining distinct from related but narrower constructs (e.g., satisfaction or trust alone).

Table 7

Digital Banking Excellence

S/N	Component 4	Item scores
1	Digital banking services meet my financial needs efficiently.	.959
2	I trust my bank to protect my financial and personal information.	.814
3	I can complete my transactions quickly without difficulty.	.959
4	I feel valued as a customer through the personalized digital services I receive.	.959
5	I trust my bank because of its strong brand reputation.	.959
6	I prefer to stay with my bank due to the time and effort required to switch.	.959
7	I feel confident that my issues with digital banking services will be addressed.	.959
8	Positive reviews from other customers influence my trust in digital banking.	.959
9	My bank provides educational resources that improve my financial knowledge.	.959
10	I find new digital banking features useful and convenient	.959
11	My banking needs are met regardless of the platform I choose to use.	.959

Source: Rotated Component Matrix Output

The fourth component can be named "Digital Banking Excellence" because the items overwhelmingly reflect high-quality, seamless, and superior digital banking experiences. Each item emphasizes aspects of excellence: efficiency (quick transactions, meeting financial needs), trust (data security, brand reputation, issue resolution), personalization (feeling valued, useful features), and convenience (multi-platform accessibility, educational resources). The consistently high factor loadings (mostly .959) suggest these elements collectively define an outstanding digital banking experience, making "excellence" the most encompassing and succinct concept. The name avoids redundancy (e.g., "trust and satisfaction" is too narrow) while capturing the premium, high-performance nature of the service described.

Table 8

Holistic Digital Banking Experience

S/N	Component 5	Item scores
1	The digital banking platform I use provides consistent and reliable services.	.879
2	I would recommend my bank's digital services to others.	.879
3	I feel safe conducting transactions using my bank's digital banking services.	.879
4	I rarely need assistance to use digital banking services.	.818
5	I find my bank's mobile banking app convenient and easy to use.	.879
6	My bank's digital services align with its overall brand image.	.879
7	I receive attractive rewards and benefits for using digital banking services.	.879
8	My bank provides multiple channels to report and resolve digital banking issues.	.879
9	I prefer banks that actively engage in social and environmental initiatives.	.879
10	I understand how to use all the features of my bank's digital platform.	.879
11	My bank regularly interacts with me through digital channels (emails, notifications, social media, etc.).	.879

Source: Rotated Component Matrix Output

The fifth component can be named "Holistic Digital Banking Experience" to encapsulate the comprehensive and interconnected themes reflected in the items. This term captures the seamless integration of usability, reliability, security, and value that defines users' overall perception of their bank's digital services. High item scores (all ≥ 0.818) underscore consistent satisfaction across multiple dimensions: functional excellence (ease of use, minimal need for assistance, feature familiarity), trust and safety (secure transactions, brand alignment), service robustness (consistent performance, multi-channel issue resolution), and engagement (rewards, proactive digital interactions). The inclusion of social/environmental initiatives further reflects a modern expectation of banks as holistic partners rather than mere service providers. By synthesizing these elements, the name emphasizes that users evaluate digital banking not just as a tool but as an end-to-end experience—where convenience, security, brand identity, and added value converge to shape loyalty and advocacy. This framing aligns with contemporary banking trends that prioritize unified, customer-centric digital ecosystems.

Table 9

Customer-Centric Digital Banking

S/N	Component 6	Item scores
1	I experience minimal downtime or technical issues when using digital banking services.	.872
2	I rarely feel the need to visit a physical branch because of the convenience of digital banking	.847
3	My bank provides strong security measures to protect against fraud and unauthorized access.	.847
4	The digital banking app or website is user-friendly.	.847
5	I can complete most of my banking transactions on my mobile device.	.847
6	I feel a sense of pride in using my bank's digital services.	.847
7	My bank offers loyalty programs that encourage me to continue using its digital banking services.	.847
8	The complaint resolution process for digital banking issues is quick and satisfactory.	.847
9	My perception of a bank improves when it participates in community development projects.	.847
10	I make informed financial decisions using digital banking services.	.847
11	I receive timely updates about new digital banking services and offers.	.847

Source: Rotated Component Matrix Output

The sixth component can be named "Customer-Centric Digital Banking". This component represents a holistic digital banking experience designed around customer needs, emphasizing convenience (minimal downtime, no branch visits, mobile transactions), usability (intuitive interface), and trust (strong security measures). It also captures emotional engagement (pride in services, positive perception of community involvement) and proactive value (loyalty programmes, timely updates, tools for informed decisions). The high factor loadings (all $\geq .847$) confirm these elements form a unified construct where seamless functionality meets personalized care, a defining feature of modern digital banking strategies that prioritize user satisfaction and retention. The name reflects not just service quality, but a deliberate shift toward user-first banking, where technology enhances accessibility, security, and emotional connection.

Discussion of findings

The PCA conducted on data obtained from respondents revealed six principal components representing the core factors influencing customers' loyalty to digital banking services in Calabar Metropolis. These components are: customer satisfaction, digital banking value proposition, perceived service quality, digital banking excellence, holistic digital banking experience, and customer-centric digital banking. Each of these factors aligns with established theories and existing literature. Customer satisfaction emerged as a foundational component, strongly aligned with the Expectation-Confirmation Theory (ECT), which posits that satisfaction is a result of positive disconfirmation of expectations,

ultimately reinforcing customer loyalty (Oliver, 1980). Abdullah and Rahman (2021) support this by emphasising that customer satisfaction in digital banking is closely tied to trust and perceived service performance. Their study in Kuala Lumpur demonstrates that when digital banking services meet or exceed customer expectations, users tend to remain loyal. The digital banking value proposition reflects customers' evaluation of the benefits received relative to the costs of using digital banking. This aligns with the Technology Acceptance Model (TAM), which highlights perceived usefulness as a key predictor of user acceptance and continued use (Davis, 1989). Alalwan et al. (2017) empirically confirm this, showing that perceived benefits such as efficiency, speed, and convenience drive both adoption and loyalty. Their findings reinforce the notion that banks must continuously enhance the utility and relevance of their digital offerings. Perceived service quality is also a key factor, grounded in the SERVQUAL model, which identifies reliability, responsiveness, and assurance as key dimensions of service quality (Parasuraman et al., 1988). Bello and Kamara (2019) provide supporting evidence in the context of Gambian banks, noting that high service quality, particularly in digital platforms, directly affects customer retention and loyalty. Seamless functionality, minimal service interruptions, and effective communication were highlighted as essential. The component of digital banking excellence reflects the overarching technological and strategic performance of digital platforms. This resonates with the Resource-Based View (RBV) theory, which suggests that firms gain competitive advantage through the effective deployment of valuable, rare, and inimitable resources (Barney, 1991). El-Sayed and Hassan (2022) found that banks in Egypt that invest in technological excellence—such as secure infrastructure, advanced features, and innovation—report higher levels of customer satisfaction and loyalty.

The holistic digital banking experience refers to the overall perception of digital interactions, including emotional, cognitive, and behavioural responses. This concept aligns with the Customer Experience (CX) framework, which asserts that delivering positive end-to-end experiences is critical for retention. Diallo and Santos (2024) confirm this, showing that a smooth, personalized, and user-friendly interface fosters emotional connections that drive loyalty. Lastly, customer-centric digital banking highlights the importance of tailoring services to individual preferences and needs, in line with Relationship Marketing Theory, which focuses on long-term customer engagement through personalization and trust-building. Ojo and Adewale (2017) in Nigeria, and Wong (2021) in Hong Kong, provide empirical backing, indicating that customer-centric strategies, such as personal recommendations, account customization, and transparent communication, significantly enhance loyalty. Collectively, these principal components are not only statistically significant but also theoretically grounded, offering both empirical robustness and practical relevance. They suggest that for banks in Calabar and similar urban centres, enhancing loyalty requires a multidimensional approach rooted in customer satisfaction, personalized experiences, and digital excellence.

Conclusion, recommendations and future studies

This research centred on examining the dimensionality of customers' loyalty towards digital banking services in Calabar Metropolis, Nigeria. The study was motivated by the growing importance of digital banking in Calabar and the need for data-driven strategies to enhance customer retention in a competitive financial environment. Using a cross-sectional survey design, primary data were collected from 366 digital banking users and analysed through PCA, a method well-suited for identifying underlying patterns in multivariate datasets. The PCA results revealed six principal components: customer satisfaction, digital banking value proposition, perceived service quality, digital banking excellence, holistic digital banking experience, and customer-centric digital banking. Each of these components explained a significant portion of the variance in customer loyalty, thereby offering a nuanced understanding of its key drivers. Specifically, the components with the highest factor loadings (customer satisfaction and perceived service quality) reaffirm the central role of trust, reliability, and service performance in fostering loyalty. Likewise, components such as digital banking excellence and customer-centric digital banking highlight the growing demand for technological robustness, personalization, and user-friendly experiences. In conclusion, the study confirms that customer loyalty in digital banking is multidimensional and shaped by both tangible service attributes and intangible experiential factors. These empirical findings underscore the need for banks operating in Calabar Metropolis to implement user-centric strategies, ensure consistent service quality, and invest in technological innovation to build lasting customer relationships. By aligning service delivery with the six identified dimensions, financial institutions can strengthen customer retention and gain a competitive advantage in the rapidly evolving digital banking sector. The following recommendations are presented based on the findings made in this study:

1. Financial service organisations should prioritize delivering consistent, transparent, and secure digital banking experiences to customers. This includes ensuring minimal technical issues, offering personalized services, and actively seeking customer feedback to improve offerings. By addressing these areas, banks can foster trust and satisfaction, which are critical for long-term loyalty.
2. It is essential for financial service organisations to highlight the unique benefits of their digital platforms, such as seamless app experiences, multi-platform accessibility, and prompt customer support. Emphasizing these advantages will make customers perceive greater value in the services, reducing their inclination to switch to competitors.
3. Financial service organisations should focus on reliability, ease of use, and efficient complaint resolution. Ensuring that transactions are processed accurately, the platform is user-friendly, and issues are resolved quickly will enhance customers' perception of service quality, thereby increasing their loyalty.
4. It is important for financial service organisations to invest in cutting-edge technologies and robust security measures to create a superior digital banking experience. Features like quick transactions, educational resources, and innovative

tools will position the bank as a leader in excellence, encouraging customers to stay loyal.

5. Financial service organisations should integrate usability, security, and proactive engagement into their digital services. Offering rewards, regular updates, and multi-channel interactions will create a seamless and satisfying end-to-end experience, strengthening customer retention.
6. It is critical for financial service organisations to tailor their digital banking services to meet individual customer needs, such as providing intuitive interfaces, loyalty programs, and timely updates. By making customers feel valued and understood, banks can build emotional connections and long-term loyalty.

Suggestions for further studies

This study was limited to users of digital banking services in Calabar metropolis. It does not give insights into the key factors affecting customers' loyalty towards digital banking services on a broader national level; hence its generalizability is limited. To enhance the study's generalizability, it is suggested that future researchers carry out studies on a national level incorporating several banking organisations in the country. This is critical because customer loyalty is influenced by diverse socio-economic, cultural, and infrastructural factors that vary significantly across different regions in the country. A national-level study would capture these regional variations and provide a more comprehensive understanding of the determinants of customer loyalty in the digital banking landscape. Furthermore, including multiple banking organisations will allow for comparative insights, helping to identify both common trends and institution-specific strategies that enhance or hinder customer loyalty. Such broader research will equip policymakers, financial institutions, and technology developers with richer data to make informed decisions that foster long-term customer relationships across the nation.

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