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Assessing the Effect of Digitalization on Customer Retention in a Competitive Market: Evidence from Startups in Lagos State Nigeria

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Abstract

An increasing number of studies have explored the role of digitalization in enhancing firm outcomes; however, limited attention has been given to how different dimensions of digitalization influence customer retention, particularly within the context of startups in developing economies. This study investigated the effect of digitalization on customer retention among startups in Lagos State, Nigeria. We examined the individual influence of data digitalization, service digitalization, digital literacy, digital innovation, digital collaboration, and cloud computing on customer retention. Data was gathered from 316 startup managers using an adapted and validated questionnaire. Drawing on multiple regression analysis, the results reveal that digital literacy, digital innovation, service digitalization, and cloud computing had significant positive effects on customer retention. Conversely, data digitalization had a significant negative effect, while digital collaboration showed no significant effect on customer retention. This study extends digitalization-performance literature by demonstrating that not all forms of digitalization uniformly enhance customer retention. These findings carry important implications for digital strategy, suggesting that startups should prioritize human-centered and service-driven digitalization approaches to retain customers.

Keywords: *Cloud Computing, Customer Retention, Digital Literacy, Digital Innovation, Digitalization, Startup Performance*

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Background to the Study

Startups are becoming increasingly pivotal to Nigeria's economic development, particularly in industries such as fintech, e-commerce, and agritech (Musa et al., 2022). They stimulate innovation, generate employment, and drive competitiveness. However, despite their promising contributions, many Nigerian startups face persistent challenges in sustaining performance metrics such as retaining customers in Nigeria's dynamic and highly saturated startup environment (Agunbiade, 2020; Akingbade, 2021). Customer retention is essential to long-term business sustainability, as it provides a stable revenue stream and reduces the high costs associated with acquiring new customers (Rane, Achari, & Choudhary, 2023). Yet, evidence suggests that a significant percentage of Nigerian startups struggle to maintain consistent customer engagement beyond the initial transaction stage. According to Agunbiade (2020) and Akingbade (2021), approximately 79% of Nigerian startups operate with less than a six-month financial buffer, which restricts their ability to invest in customer experience strategies that are essential for retention. Furthermore, George and Baskar (2024) emphasize that the absence of digital customer engagement tools often results in subpar service delivery and weakened brand loyalty.

The trend is not unique to Nigeria alone, studies reveal that over 55% of startups worldwide fail to retain a substantial portion of their customers beyond the first engagement, largely due to limited capacity to meet evolving customer expectations (Safari & Das, 2022). In developing economies, the situation is often exacerbated by infrastructural deficiencies, market volatility, and underdeveloped digital ecosystems (Vrontis, Chaudhuri, & Chatterjee, 2022). For startups in Nigeria, the challenge of customer retention is often linked to an inability to harness the full potential of digital technologies that can personalize customer experiences, improve communication channels, and foster long-term relationships (Musa et al., 2022).

Digitalization has emerged as a potentially transformative tool for addressing the retention gap. Technologies such as customer relationship management (CRM) systems, data analytics, and AI-driven personalization can enhance service delivery and create more responsive customer engagement platforms (Rosalsky, 2020). However, the extent to which Nigerian startups leverage digital tools to improve customer retention remains underexplored. Despite widespread digital innovation, Musa et al. (2022) report that over 60% of startups in Nigeria struggle to sustain profitability, in part due to low customer retention rates linked to insufficient digital engagement strategies. Given these challenges, this study seeks to examine the effect of digitalization on customer retention among startups in Nigeria. By exploring this relationship, the study provides insight into how digitalization can serve as a tool for enhancing customer loyalty and improving overall firm performance in the startup ecosystem. Understanding this is critical for entrepreneurs, investors, and policymakers looking to strengthen the foundations of Nigeria's startup economy.

The remainder of the paper is organized as follows: extant literature was surveyed in Section 2, and Section 3 deals with the methodology, findings are analyzed and presented in Section 4. The paper ends with a conclusion and policy recommendations including the limitations, and direction for future research in the studied area as section 5.

Literature Review

Customer Retention

Customer retention refers to a company's ability to maintain long-term relationships with existing customers, which is often more cost-effective than acquiring new ones (Wang et al., 2023). Alkitbi, Alshurideh, Al Kurdi and Salloum (2020) define it as strategies to reduce attrition, enhance loyalty, and ensure repeat business. These strategies, rooted in relationship marketing, focus on customer engagement, personalized experiences, and value creation (Liu, Tian, & Huang, 2024). Digital tools, such as data analytics, further enhance retention by predicting customer behaviors and personalizing services (Ahmed et al., 2024). Research emphasizes the financial benefits of retention, showing that even a 5% increase can lead to a significant profit boost (Chen et al., 2020). Loyal customers also have higher lifetime value and serve as brand advocates, reducing the need for costly advertising (Angraini, Fahmy, Rahman, & Ma'ruf, 2023). However, retention efforts can be resource-intensive, and over-reliance on existing customers may hinder innovation and market expansion (Javed et al., 2021).

Digitalization

Digitalization is a transformative process that has significantly impacted various sectors, including trade, agriculture, and government services (Mishrif & Khan, 2023). It involves the application of information technology to enhance operational efficiency, improve business models, and facilitate industrial reform (Li, Tong, Wei, & Yang, 2022). Saarikko, Westergren and Blomquist (2020) defined digitalization as the process of leveraging digital products and systems to develop new business procedures and models, emphasizing its role in enabling innovation. The advent of digital technologies has opened new opportunities for businesses, particularly startups. Entrepreneurs' ability to interact with digital infrastructure is crucial for their success (Ughetto, Rossi, Audretsch, Piva, & Lehmann, 2020). The COVID-19 pandemic further accelerated digital adoption, especially in remote work, showcasing digitalization's role in enhancing business resilience (Rosalsky, 2020). Digital platforms, such as mobile connectivity, cloud computing, and AI, enable firms to streamline operations, reduce costs, and improve customer engagement (Mishrif & Khan, 2023; Soto-Acosta, 2020).

However, digitalization presents challenges, including resource constraints and bureaucratic processes, particularly in developing economies (Amankwah-Amoah, Khan, Wood, & Knight, 2021). The reliance on high-speed internet and data infrastructure is another barrier (Rosalsky, 2020). Despite these challenges, the potential benefits of digitalization in improving competitiveness and efficiency remain significant (Patil, 2023). This study defines digitalization as the integration of information technology within production processes to enhance operational efficiency and foster economic transformation. Key sub-variables include data digitalization, service digitalization, digital literacy, digital collaboration, digital innovation, and cloud computing (Inakefe et al., 2023; Olaniyi, Abolanriwa, & Ibraheem, 2024).

Digitalization and Its Role in Customer Retention

Digitalization, the integration of digital technologies into business operations, has transformed industries and enhanced customer engagement (Mishrif & Khan, 2023; Li et al., 2022). Through technologies like AI, cloud computing, and IoT, digitalization allows businesses to optimize processes, reduce costs, and improve competitiveness (Soto-Acosta, 2020). Additionally, digital tools have been pivotal during crises like the COVID-19 pandemic, where remote work and digital solutions facilitated business continuity (Rosalsky, 2020). Digitalization has a direct impact on customer retention. Data digitalization enables businesses to collect and analyze customer data for personalized marketing, boosting satisfaction and loyalty (Ijomah, Idemudia, Eyo-Udo, & Anjorin, 2024). Digital literacy ensures employees can effectively engage with customers, while digital collaboration platforms allow for real-time interaction, fostering stronger relationships (Rane et al., 2023; Sofi, Bashir, Parry, & Dar, 2020). Moreover, digital innovation helps businesses meet evolving customer expectations, further enhancing retention (Mariani & Nambisan, 2021). However, some studies indicate limitations, such as challenges in digital tool integration with CRM systems (Erlangga, 2023). Furthermore, the impact of digital literacy on retention is less significant in certain contexts (Junaedi et al., 2024). The study then hypothesizes:

H_0: Digitalization has no significant effect on customer retention in startups

Theoretical Background

Disruptive Innovation Theory

Disruptive Innovation Theory, developed by Clayton Christensen (1997), describes how simpler, more convenient, and often cheaper innovations can enter a market from the bottom and eventually displace established incumbents. These innovations, often dismissed at first, eventually redefine market dynamics by responding more effectively to changing customer needs and expectations. In the context of startups, particularly in rapidly evolving digital environments, disruptive innovation becomes a critical strategy for building long-term customer relationships and sustaining growth. Central to this theory is the understanding that value creation and delivery evolve through innovation. Startups that adopt emerging digital technologies such as cloud computing, digital collaboration tools, and data-driven personalization are more likely to introduce innovative services that enhance the customer experience and foster loyalty (Mohapatra, Mohanty, Mohanty, Mahalik, & Nayak, 2025). Soto-Acosta (2020) observed that such digitalization goes beyond automating tasks; they redefine the firm's value proposition, enabling the business to meet customer needs in more dynamic and responsive ways.

In terms of customer retention, Disruptive Innovation Theory offers valuable insights. Rather than focusing solely on acquiring new customers, disruptive firms often succeed by retaining existing customers through continuous innovation, agility, and responsiveness (Kumar & Aithal, 2025). By leveraging digital tools, startups can personalize interactions, anticipate customer needs, and deliver consistent service quality all of which are key to improving retention. As Ughetto et al. (2020) noted, the survival and growth of startups are increasingly tied to how effectively they engage with digital infrastructure to foster lasting customer relationships. Through innovations in service digitalization, digital literacy, and cloud-based platforms, startups can build ecosystems that encourage repeat patronage and long-term commitment (Alka, Sreenivasan, & Suresh, 2025). This aligns with Christensen's (1997) assertion that disruptive innovations reshape consumer behavior and lock-in effects by continuously offering more relevant and adaptive solutions than traditional firms.

In this light, the theory provides a strategic framework for understanding how startups can retain customers by disrupting traditional service models and replacing them with digitally enhanced, customer-centric approaches. It highlights that retention is not merely a function of customer satisfaction, but a result of delivering ongoing value through innovation. Thus, Disruptive Innovation Theory forms the theoretical foundation for examining how digitalization through subcomponents like data digitalization, service digitalization, digital collaboration, digital literacy, cloud computing, and digital innovation influences customer retention among startups in Lagos, Nigeria.

Methodology

This study employs a descriptive survey design to investigate the effect of digitalization on customer retention among startups operating in Lagos State, Nigeria. The quantitative approach allows for the systematic collection and analysis of data using structured instruments (Salmia, 2023).

Sample and Procedure

The study targeted key decision-makers (managers) from startups in Lagos State. A total of 316 startups were selected using simple random sampling from sectors such as AgriTech, HealthTech, EdTech, FinTech, E-commerce and Logistics. Data were collected through a self-administered adapted questionnaire distributed physically and electronically to the respondents.

Table 1: Demographic Characteristics of Respondents

Demographic Characteristics	Frequency	Percentage %
Gender		
Male	146	54.3
Female	123	45.7
Age		
21-35	76	28.3
36-50	128	47.6
51 and above	65	24.2
Education		
Diploma	35	13.0
Bachelors	166	61.7
Post grad	68	25.2

Source: Authors' computation

Table 1 presents the demographic characteristics of the respondents. In terms of gender, 54.3% of the respondents were male, while 45.7% were female. The age distribution revealed that 28.3% of the respondents were between the ages of 21 and 35, 47.6% were aged between

36 and 50, and 24.2% were aged 51 and above. Regarding educational qualifications, the majority of respondents (61.7%) held a Bachelor's degree, followed by 25.2% who had a Postgraduate qualification, and 13.0% had a Diploma. These findings reflect a relatively balanced gender distribution, with a significant concentration of respondents in the 36-50 age range and a high level of educational attainment among the participants.

Measures

Following the sampling procedure, the study employed a structured questionnaire adapted from previously validated instruments to measure the constructs. The survey used a modified Likert type 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree), to gather responses. The measurement of the variables is grounded in the conceptual and theoretical framework as operationalized in prior studies. While there are various scale options, including five, six, or seven-point Likert scales, Aybek and Toraman (2022) emphasized that five- and six-point scales are generally preferred for research purposes. The majority of the questionnaire items were derived and modified from the works of selected authors, as detailed in Table 2.

Table 2: Sources of Adapted Questionnaire

Variables	Sources of instrument
Independent Variable: Digitalization	
Data digitalization	Al-kharabsheh, Attiany, Alshawabkeh, Hamadneh, & Alshurideh (2023); Wang et al. (2023)
Service digitalization	Shabani et al. (2022)
Digital collaboration	Mena-Guacas. et al (2024); Reim, Anderson, & Eckerwall. (2023)
Digital literacy	Bayrakcı & Narmanlıoğlu (2021).
Digital innovation	Saad & Alnuiami (2023); Vicente, Lucas, Carlos, & Bem-Haja, (2020)
Cloud computing	Al-Sharafi, Arshah, & Abu-Shanab (2019); Asadi, Abdekhoda, & Nadrian (2020); Low, Chen, & Wu (2011)
Dependent Variable	
Customer retention	Ang & Buttle (2006)

Source: Author's compilation

Validity and Reliability

Table 3: Validity & Reliability Analysis

Scale	Composite Reliability	Average Variance Extracted	Cronbach's Alpha
Customer Retention	0.963	0.898	0.939
Data Digitalization	0.866	0.716	0.848
Service Digitalization	0.964	0.899	0.943
Digital Collaboration	0.970	0.914	0.954
Digital Literacy	0.952	0.873	0.921
Digital Innovation	0.933	0.833	0.886
Cloud Computing	0.961	0.890	0.941
Overall Cronbach			0.920

Source: Authors' computation

Table 3 presents the results of the validity and reliability tests for the dataset. The scales show high reliability, as indicated by their composite reliabilities and Cronbach's Alpha coefficients. The Average Variance Extracted (AVE) values for all constructs exceed the recommended threshold of 0.5, demonstrating satisfactory convergent validity. The overall Cronbach's Alpha value (0.920) reflects an extremely high level of internal consistency across all scales, confirming that the entire dataset exhibits robust reliability. This is in line with the recommendations of Hair, Sarstedt, Ringle and Mena (2012) for scale validity and reliability, suggesting that the scales collectively measure the constructs effectively with minimal measurement error.

Model Specification

This study assumes that digitalization significantly influences customer retention among tech-based startups in Lagos State, Nigeria. Drawing on the Disruptive Innovation Theory, it is posited that various dimensions of digitalization such as data digitalization, service digitalization, digital literacy, digital collaboration, digital innovation, and cloud computing collectively impact a firm's ability to retain customers in an increasingly competitive environment. Based on the conceptual and theoretical framework, the study specifies the functional relationship between the dependent variable (Customer Retention, CR) and independent variables representing digitalization (D):

CR = f (DD, SD, DL, DC,DI ,CC)

Where:
CR = Customer Retention
DD = Data Digitalization
SD = Service Digitalization
DL = Digital Literacy
DC = Digital Collaboration
DI = Digital Innovation
CC = Cloud Computing

This functional relationship is expressed in a multiple regression model as:

$$CR_i = \beta_0 + \beta_1 DD_i + \beta_2 SD_i + \beta_3 DC_i + \beta_4 DI_i + \beta_5 DL_i + \beta_6 CC_i + \mu_i$$

Where:
β_0 = Intercept
$\beta_1 - \beta_6$ = Regression coefficients for each predictor
μ_i = Error term
$_i$ = Startup unit of observation

The a priori expectation is that each component of digitalization will have a positive and significant effect on customer retention, consistent with prior research and theoretical expectations (Christensen, 1997; Ughetto et al., 2020). Ethical considerations were observed throughout the research process. The data collection adhered to confidentiality and informed consent protocols. No data were manipulated, and responses with errors or incomplete values were excluded from the final analysis to maintain data integrity.

Results and Discussion

Results

A multiple regression model was constructed to examine the effect of various dimensions of digitalization (service digitalization, digital literacy, digital innovation, cloud computing, data digitalization, and digital collaboration) on customer retention among startups in Lagos State, Nigeria. The regression model was used to determine the individual effects of these digitalization factors on customer retention, with customer retention as the dependent variable

Table 4: Regression Analysis

Model	*B*	T	Sig.	ANOVA (Sig.)	R^2	Adj R^2	F (6, 261)
(Constant)	8.631	10.097	.000				
Data Digitalization	-.145	-2.070	.039	0.001[b]	0.814[a]	0.654	85.594
Service Digitalization	.179	2.475	.014				
Digital Collaboration	-.089	-1.234	.218				
Digital Literacy	.303	5.393	.000				
Digital Innovation	.243	3.740	.000				
Cloud Computing	.154	2.108	.036				

Dependent Variable: Customer Retention
Predictors: (Constant), Cloud Computing, Digital Collaboration, Digital Literacy, Digital Innovation, Data Digitalization, Service Digitalization

Source: Author's computation

Table 4 presents the results of the multiple regression analysis examining the effect of digitalization on customer retention among startups in Lagos State, Nigeria. The findings reveal several important relationships between digitalization dimensions and customer retention. Service Digitalization ($\beta = 0.179$, $t = 2.475$, $p < 0.05$) demonstrates a significant positive effect on customer retention. This suggests that improvements in service-related digital processes positively impact the ability of startups to retain customers. Digital Literacy ($\beta = 0.303$, $t = 5.393$, $p < 0.05$) shows the strongest positive effect among the variables, emphasizing that higher levels of digital literacy among startup employees and leaders are strongly associated with better customer retention outcomes. Digital Innovation ($\beta = 0.243$, $t = 3.740$, $p < 0.05$) also has a positive impact on customer retention, suggesting that innovation in digital technologies contributes to improved customer engagement and loyalty. Cloud Computing ($\beta = 0.154$, $t = 2.108$, $p < 0.05$) positively influences customer retention as well, indicating that startups leveraging cloud-based solutions experience improved retention rates. Data Digitalization ($\beta = -0.145$, $t = -2.070$, $p < 0.05$) is found to have a negative but significant effect on customer retention, suggesting that excessive or improper data-driven processes may detract from the customer experience, leading to decreased retention. Digital Collaboration ($\beta = -0.089$, $t = -1.234$, $p > 0.05$) shows a negative but insignificant effect, implying that digital collaboration, in this context, does not significantly influence customer retention.

The results of the regression analysis revealed that out of the six dimensions of digitalization examined, only service digitalization, digital literacy, digital innovation, and cloud computing had positive and statistically significant effects on customer retention. In contrast, data digitalization showed a negative but significant effect, while digital collaboration was not significant.

Thus, the prescriptive model is revised to reflect only the variables with significant effects as follows:

CR = 8.631 - 0.145DD + 0.179SD + 0.303DL + 0.243DI + 0.154CC...... eq 1

The coefficient of determination ($R^2 = 0.654$) indicates that 65.4% of the variation in customer retention is explained by the digitalization variables in the model. This suggests that digitalization plays a significant role in shaping customer retention, though other factors outside the model account for the remaining 34.6% of the variance. The F-statistic ($F(6, 261) = 85.594$, $p < 0.05$) confirms the overall significance of the model, indicating that digitalization significantly affects customer retention among startups in Lagos State. Based on these results, the null hypothesis, which states that digitalization has no significant effect on customer retention, is rejected.

Discussion

The study examined the effect of digitalization on customer retention among startups in Lagos State, Nigeria. The results of the study indicate that digitalization significantly enhances customer retention (*Adj.* $R^2 = 0.654$, $F(6, 261) = 85.594$, $p < 0.05$), leading to the rejection of the null hypothesis. This suggests that startups which effectively leverage digital tools such as customer data analytics, personalized marketing, and enhanced engagement strategies are more likely to retain their customers over the long term. The findings align with prior literature that emphasizes the positive impact of digitalization on customer retention. Ijomah et al. (2024) underscore the value of data digitalization in understanding customer behavior and enhancing personalized marketing strategies, while Sofi et al. (2020) highlight that digital competence in employees improves customer service, fostering customer loyalty. Moreover, Rane et al. (2023) point out that digital collaboration tools, such as chatbots and customer feedback systems, play a key role in engaging and retaining customers, a view supported by this study's findings. The positive effect of digitalization on customer retention also aligns with studies on digital innovation. As Mariani and Nambisan (2021) suggest, startups that continuously introduce new or improved digital services are better equipped to retain customers, offering unique value propositions. This study reinforces the importance of digital innovation in enhancing customer experience and promoting customer loyalty.

However, while most literature supports the beneficial effects of digitalization on customer retention, some studies suggest the impact can be context-dependent. Junaedi et al. (2024) found that the effect of digitalization on retention can be limited if customers do not fully engage with digital platforms or prefer traditional service models. Similarly, Erlangga (2023) highlighted that the success of digital initiatives in enhancing retention depends on the proper integration of customer relationship management (CRM) systems. Without a robust CRM framework, digital tools may fail to engage customers effectively, undermining retention efforts. Contrasting with this study's findings, some scholars argue that excessive reliance on automation could reduce customer loyalty, particularly if interactions become impersonal. Zhang et al. (2024) and Roman (2024) suggest that over-automation in customer service, such as replacing human interactions with AI-driven solutions, could negatively affect customer satisfaction. This view calls for a balanced approach where digital tools complement rather than replace human interaction in customer service processes.

Theoretical Implications

The study's findings contribute to the theoretical understanding of how digitalization influences customer retention, especially in the context of startups. The findings of this study reinforce the relevance of Disruptive Innovation Theory (Christensen, 1997) in understanding the evolving dynamics of customer retention in the digital age. The results suggest that startups that adopt emerging digital technologies such as cloud computing, digital collaboration platforms, and personalized service innovations can create new forms of value that challenge traditional customer service models. This supports Christensen's (1997) view that disruptive innovations reshape market expectations by offering more accessible, responsive, and cost-effective solutions. The study demonstrates that digitalization is not just a technological upgrade, but a strategic lever that enables startups to innovate their customer engagement practices in ways that strengthen long-term loyalty (Kopalle, Kumar, & Subramaniam, 2020). As Ashrafi, Constantinides, Mehandjiev, & Thatcher (2025) argued, disruption is most effective when it transforms not only products and services but also the underlying assumptions of how value is delivered and perceived by customers. In this context, digitalization enhances customer retention by continuously adapting offerings to meet shifting consumer preferences and behaviors. Moreover, the findings caution that disruptive digital strategies must be implemented thoughtfully. While innovation can lead to competitive advantage, it must also align with customer needs and usability expectations. Failure to deliver value through digitalization may result in customer disengagement, echoing the risks Christensen (1997) identified when disruptive efforts misalign with market demands.

Policy Implications

The findings of this study have significant policy implications, particularly for government agencies and organizations seeking to foster digitalization in startups. Policymakers should consider implementing policies that support digital literacy and provide startups with the tools necessary for digitalization. These policies could include grants, subsidies, and training programs that help startups integrate systems and digital tools essential for customer engagement and retention. Moreover, the study suggests that creating a supportive infrastructure for digital tools, such as cloud-based data analytics platforms and customer feedback systems, could help startups better understand and address customer needs. Furthermore, public policies that promote affordable internet access and enhance the digitalization capabilities of small businesses could help level the playing field for startups.

Conclusion and Further Studies

The objective of this study was to examine the effect of digitalization on customer retention among startups in Lagos State, Nigeria. This study confirms that digitalization plays a crucial role in enhancing customer retention among startups in Lagos State, Nigeria. Startups that leverage digital tools such as data digitalization, digital literacy, digital collaboration, and digital innovation are more likely to retain customers and build lasting relationships. The findings emphasize that the effective use of digitalization tools not only improves customer engagement but also strengthens customer loyalty, providing startups with a competitive edge in an increasingly digital business landscape.

While this study provides valuable insights, future research could explore the moderating effects of demographic factors, such as age and income, on the relationship between digitalization and customer retention. Additionally, further studies could focus on specific digital tools (e.g., social media, mobile apps) to assess their individual effects on customer retention in different industries. Comparative research across other regions within Nigeria or other African countries could also help determine the generalizability of the findings, offering a broader understanding of how digitalization influences customer retention in various market contexts.

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