Digital Technologies, Financial Innovations and Operational Efficiency as Drivers of Disruptive Innovation in Nigerian Fintech Industry

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Abstract:

Disruptive innovation has become a defining force reshaping financial service delivery across emerging economies and Nigeria's Fintech industry represents one of the one of the dynamic context where this transformation is unfolding. This study examines the extent to which digital technologies, financial innovation and operational efficiency drives disruptive innovation in the Nigeria Fintech sector. Grounded in Christensen's Disruptive Innovation and Resource-Based View (RBV), the research engaged a quantitative research design with a population of six hundred respondents from First Bank Plc. in selected First Bank branches at Shomolu, Yaba and Ikeja Local Government Area in Lagos State. A sample size of 240 was derived using Yamene derivation formula and a multi-stage sampling technique was employed, incorporating purposive and convenience sampling methods to select employees in five department and levels of managerial position. The study tested four hypotheses regarding the impact of digital technologies, financial innovation, operational efficiency and the joint effect on disruptive innovation. The findings revealed that digital technologies, financial innovation and operational efficiency and the joint effect influences disruptive innovation with an overall model R^2 value of 0.513, this suggest that 51.3% of the variation in innovation disruption is explained by the joint effect of the variables. Specifically, digital technologies (β= 0.490, t= 8.973, $p<0.05$), financial innovation (β= 0.206, t= 2.802, $p<0.05$) and operational efficiency (β= 0.240, t= 2.530, $p<0.05$) were all found to significantly enhance disruptive innovation. These findings show that technology-driven tools are central to the disruptive strength of Fintech firms in Nigeria. The study recommends enhancing digital infrastructures, strengthening regulatory frameworks and supporting Fintech solutions that promote innovation, efficiency and financial inclusion.

Keywords: *Digital Technologies, Disruptive Innovation, Financial Innovation, Operational Efficiency*

1.0 Introduction

The rise of financial technology (Fintech) has created new possibilities for conducting financial transactions by leveraging mobile technologies, block chain systems, and artificial intelligence to redesign how financial services are delivered. These digital tools enable faster, more accessible, and lower-cost financial solutions, allowing users to save, invest, make payments, access credit, and manage risks without relying solely on traditional institutions. Such innovations offer streamlined processes, reduced operational barriers, and greater customization, making financial services more responsive to changing consumer needs. When viewed through the lens of disruptive innovation theory, these developments illustrate how simpler, more affordable, and technology-driven alternatives can gradually challenge and potentially displace long-established financial systems and practices. In this way, Fintech not only modernizes service delivery but also introduces competitive pressures that reshape the broader financial landscape.

Digital technologies and Fintech have become central to the disruptive transformation occurring in the Nigerian Fintech industry. While financial inclusion, defined as access to and effective use of affordable financial services, remains an important development outcome, it functions more as a supportive benefit rather than the primary focus within this context. Evidence shows that expanding access to financial services promotes poverty reduction, economic resilience, inclusive growth, and broader sustainable development (Demirguc-Kunt et al., 2018). However, the key force reshaping the Nigerian Fintech space is the rapid integration of advanced digital technologies that enhance how financial services are designed, delivered, and consumed.

Recent advancements in Fintech have introduced innovative solutions that strengthen service delivery and operational models within the sector (Henriques & Sardarsky, 2025). Although not the central theme, financial inclusion emerges naturally from these technological advancements. As Fintech firms develop digital solutions in areas such as payments, savings, lending, insurance, trading, and risk management, they create more accessible and cost-effective alternatives to traditional financial services. These innovations, in turn, help reduce long-standing issues of income inequality and financial exclusion by effectively broadening participation in the financial system (Gomber et al., 2018; Hadula et al., 2023; Care et al., 2023).

Despite global progress, Sub-Saharan Africa's continues to have some of the highest financial exclusion rates. In Nigeria, more than one third of the adult population remains excluded from the formal financial system (Central Bank of Nigeria (CBN), 2023). Lagos State, the country's economic and commercial nerve centre, embodies a paradox with having the highest concentration of

banks on one hand and on the other a large segment of the population especially the informal sector workers, women and SMEs-remain excluded from affordable and reliable financial services.

Despite the rapid expansion of Fintech in Nigeria, a significant proportion of the population remains excluded from formal financial services. According to the Global Findex Database as of 2017, about 36% of Nigerian adults were financially excluded with majority concentrated in the rural and low income group (Demirguc-Kunt et al., 2020). Disruptive innovations such as mobile money, agent banking, peer-to-peer lending, Block chain-based remittances and artificial intelligence- driven credit scoring are theoretically capable of lowering transaction costs, improving accessibility and reaching underserved population (Donou-Adonsou, 2019; Ozili, 2018). However their real impact on deepening and sustaining financial inclusion in Nigeria remains uncertain.

The banking sector is not left out from the after effect of innovation disruption with cutting edge technologies that provide faster, cheaper and more inclusive financial delivery services that solve the pain point that customers encounter with traditional banking activities (Quingle, 2024; Ghalot and Ghosh, 2023). Also with the raving desires of the digital native Millennia's who demand instant on-demand access to financial services and seamless integration that provides value transparency and personalized experiences on their financial activities with a tap of their smart phones had led banks to struggling to meet these expectations.

Moreover, disruptive Fintech is not without risks, studies suggest that rapid growth of digital lending and mobile banking has in some cases led to over-indebtedness, predatory lending practices, fraud, cyber insecurity and consumer exploitation due to weak regulatory oversight (World Bank, 2022). Digital divides-arising from poor infrastructure, low digital literacy and socio-economic inequalities- means that innovations often serve already-connected urban populations, while marginal rural dwellers, women and informal workers are left out (Aduda and Kalunda, 2019; Dermiguc-Kunt et al., 2020). In this way, disruptive Fintech solutions, while expanding access, may also exacerbate inequality and financial vulnerability when not inclusively designed and responsibly regulated.

The emergence of disruptive innovation has profoundly shaped Nigeria's financial landscape, particularly with the implementation of the CBN cashless policy introduced in 2012 and reinforced in subsequent years, especially during the 2022-2023 currency redesign exercise. The policy introduced aimed to reduce the volume of cash in circulation, encourage electronic transaction and minimize cost of cash management (CBN, 2023).While, promoting financial inclusion and efficiency in payment systems, necessitated the rapid

adoption of technologies such as mobile banking, automated teller machines, internet banking, point of sale (POS) terminals, electronic funds transfer and Fintech applications (Ogedengbe and Ojo, 2023; Ndukwe and Oladipo, 2022). These innovations redefined financial operations, improved accessibility and transformed traditional banking structures in Nigeria's financial institutions.

However, while these technological innovations have improved financial access operational efficiency, they have also introduced significant disruptions and challenges which included infrastructural inadequacies that include poor internet connectivity, power instability and frequent transaction failures (Eze and Chinedu, 2022), this disrupted customer experience and reduced public trust in digital payment system. Other challenges were increasing volume of online fake transaction as a result of breach in cyber security and threat like phishing and unauthorized withdrawal and identity theft (Adeleke, 2023). Furthermore, the surge in Fintech innovations has intensified competition among financial institutions, compelling traditional banks to adopt aggressive digital transformation strategies (Okafor, 2023). This study intends to explore the role of digital technologies, financial innovation and operational efficiencies as drivers of disruptive innovation in Nigerian Fintech Industry, particularly, in Lagos State.

2.0 Literature Review and Hypotheses Statements

Digital Technologies

Digital technologies broadly defined as the suite of information and communication technologies (ICT) that enable electronic data processing, storage, transmission and analytic are central to contemporary transformation in financial services. Fintech technologies such as Mobile banking app, countless payment systems, internet banking, USSD, cloud computing, block chain (distributed ledger technologies) and application programming (APIs) are novel business models that are designed to improve banking and online transaction, customer experiences and accessibility (Arner et al., 2020; Gomber et al., 2018).

These cutting edge technology and digital banking platforms has improved traditional processes by enabling users to access services with ease and flexibility. The mobile and internet banking or USSD provides ubiquitous access to basic financial services especially in low-infrastructure contexts (Ndukwe and Oladipo, 2022; Ogedengbe and Ojo, 2023). Other services such as cloud computing and micro-services provides low infrastructure costs and support for rapid scaling, AI and machine learning for credit scoring, fraud detection, personalized and operational automation and distributed ledger technologies for secure transparent settlement and identity management are

innovations that had change the banking and financial institutions. These technologies has contributed to banks operational efficiency, improved customer experience and creation of novel financial products that reduces transaction costs, shorten service delivery times and expand access to financial services in developing economies.

In the developed economies digital technologies has shaped the financial institutions operations through integrated open banking APIs that enhances data sharing, transparency and innovation in digital financial services (Zetsche et al., 2020), machine learning and Block chain for improved credit scoring systems and streamline payment settlements (Vives, 2019). In developing countries like Nigeria, digital technologies have emerged as powerful tools for fostering financial inclusion and supporting the apex bank (CBN) cashless policy initiative. The rapid adoption of mobile banking, USSD codes and Fintech applications such as OPay, Flutterwave and Paystack illustrate the importance of digital innovation in bridging the gap in financial accessibility (Olarenwaju et al., 2021; Ozili, 2018). Digital technologies facilitates disruptive innovation by enabling new market entrants to offer faster, cheaper and more inclusive financial solutions (Ndung'u and Signe, 2020) and is essential for sustaining the performance in financial institutions.Thus we hypothesise as follows;

H1: Digital technologies have a significant effect on disruptive innovation among Fintech institutions in Nigeria.

With model specification: $DI = \alpha + \beta_1 TI1\text{-}5 + \boldsymbol{\varepsilon}$

Where DI= Disruptive Innovation; TI= Technological Innovation

Financial Innovation

Financial innovation has emerged as a significant strategy that is driving transformation in the global financial systems with the creation and adoption of new financial products, services, technologies and organizational plead this transformation through investments in research infrastructure, and AI-enabled entrepreneurship pathways, processes that enhances efficiency and inclusiveness of financial markets. The development of new products, services, processes and organizational structures aimed at provision and utilization of financial services encompasses digital wallets, peer-to-peer (P2P) lending, microfinance innovations, embedded finance, algorithmic credit scoring and digital savings applications that have defined the ways individuals and institutions access and manage financial services (Lee and Shin, 2018; Gomber, Kock &Siering, 2018). In the developed economies financial innovations has improved financial institutions operational efficiencies, competition and increased customers' patronage. For instance, the

introduction of open banking and application programming interfaces (APIs) has enhanced customer choice, encouraged market entry of Fintech firms and promoted greater financial transparency (Arner Berberis and Buckley, 2020). Also the integration of algorithmic credit scoring and robo-advisory platforms has increased access to financial products and reduced service delivery costs (Bhattcharjee et al., 2024). While in Nigeria, financial innovation is instrumental in promoting financial inclusion and improving service delivery. For Nigeria, sustaining financial innovation requires balancing technological advancement with effective oversight, cyber security measures, and policies that promote consumer protection and equitable access to financial services (World Bank, 2023). Thus we proposed as follows;

H2: Financial innovations have a significant effect on disruptive innovation among Fintech institutions in Nigeria.

With model specification: $DI = \alpha + \beta_1 FI1\text{-}5 + \boldsymbol{\varepsilon}$

Where DI= Disruptive Innovation; FI= Financial Innovation

Operational Efficiency

Operational efficiency in the financial industry involves the organizations ability to deliver products or services in a cost-effective, timely and reliable manner by optimizing processes, resources and technologies in financial services, operational efficiency is commonly measured by processing speed, cost per transaction that enable providers to offer services at price-sensitive or low-margin market segment (Christensen et al., 2015). The informal and underserved communities is able to benefit from the application of digital technologies through the use of mobile-first architectures and agent network such as Money point, Opay, Pagawith services delivered at low incremental cost. Ndukwe& Oladipo in their studies proposed that the combination of lean digital operational with local agent liquidity management and lightweight on boarding increases the transactional reach of users and also reduces the operational overheads

Furthermore, the adoption of cloud services, mobile-first product design and algorithmic decision have cut the cost and time of on boarding, payment and small-ticket lending and driving inclusion and market growth. On the other hand, inconsistent power supply, limited broadband penetration and reliance on legacy core banking systems in incumbent banks create operational bottlenecks that affect potential operational efficiency (Adeleke, 2023; Eze and Chinedu, 2022). Also adopting new technologies without parallel change in governance, skills and process architecture often yields suboptimal outcomes. Therefore, effective digital transformation requires re-engineering front and

back office processes, investing in staff training and deploying robust monitoring systems will improve Fintech operational efficiencies (Osei et al., 2023). Therefore we propose;

H3: Operational efficiency has a significant effect on disruptive innovation among Fintech institutions in Nigeria.

With model specification:DI = $\alpha + \beta_1 OE1\text{-}5 + \boldsymbol{\varepsilon}$

Where DI= Disruptive Innovation; OE= Operational Efficiency

The combined influence of digital technologies, financial innovations and operational efficiency has become a power driver of disruptive innovation in global financial sector. This triad relationship creates a reinforcing cycle-technology that drives innovation, demands efficiency and amplifies the transformative impact of the financial industry. Fintech firms in Europe and Asia had been able to combine advanced analytics and Blockchain infrastructure with process automation for improved financial operations. Similarly in Africa, firms such as M-Pesa, Flutterwave and Paystack have leveraged digital technologies and innovative business models to reduce transaction costs and expand access to financial services especially in unbanked communities (Kou & Lu, 2025; Ogedengbe and Ojo, 2023). In Nigeria, the interaction of mobile-based technologies, flexible payment systems and agile operational processes has redefined the financial landscape by creating new value propositions. Therefore realizing the disruptive potentials of the Fintech ecosystem requires investment in digital technologies, innovation for improved operational efficiency. Thus we proposed;

H4: Digital technologies, financial innovations and operational efficiency have a joint significant effect on disruptive innovation among Fintech institutions in Nigeria.

Disruptive Innovation in Fintech Industry

The Financial technology involves the application of technology for delivering financial services which dates back from 1918 where the Federal Reserve Bank of United State established a wire transfer network using telegram and codes for money transfer. This further in 1967 resulted to the installation of Automated Teller Machine (ATM) at a branch in Barclay Bank in Enfield, North London, this machine allows customers to insert paper checks into ATM for cash an innovation that characterized physical simulation of digital financial services. The NASDAQ world digital stock exchange launched in 1970 followed by the communication protocol between financial institutions facilitated large volumes of cross-border payment. This trend encouraged the introduction of

mainframe computers for banks online banking and financial activities (Cao et al, 2021; Israel et al., 2020).

With the introduction of PayPal which highlight a new era of online financial transaction, attracted profit and competitive advantage, had also resulted to distrust among financial institutions opened the market for new Fintech-related entrants with technological revolution applications as domain players (Aziz et al., 2022; Zhang et al., 2020; Zhou et al., 2022). This new wave incorporated smart phones and mobile devises with internet accessibility for faster financial services. Also, series of innovation activities such as block chain, crypto currencies, mobile Peer to Peer (P2P) payment, digital lending and cross border remittance became the new norm of disruptive innovation in the financial industry.

2.1 Theoretical Framework

Innovation is defined as new ideas, devices or method which offers better solution that meet the requirement of unarticulated needs or existing market needs. This is accomplished through more effective products, processes, services, technologies or business models that are available to market, government and society (Shektar and Priyanka, 2018).

Two theories underpins this study, they are the Disruptive innovation theory and resource-based view theory;

Disruptive Innovation Theory

Christensen first introduced in his seminal work "The innovator's Dilemma" (1997) in which he explained how new and smaller firms challenged and eventually displaced established incumbents through innovations that initially appear inferior buy gradually redefine market competition. He stated that disruptive innovations begins by targeting low-end or undeserved segment of the market that the large firms overlooked since their focus is on high-value, high margin customers. These innovations offer more affordable and more accessible solutions that appeal to consumers who do not need the full performance level offered by mainstream products (Christensen and Raynor, 2003).

Over time, disruptive innovations improve the quality and capabilities eventually moving "up market" to attract mainstream customers. As they evolve, they alter the competitive landscape, challenge existing business models and push dominant players out of the market. The theory emphasizes that incumbents fail not because of technological incompetence, but because their strategic choice, business model and customer demands that prevent them from investing in innovations that initially look unattractive or unprofitable.

This dynamic explains why established companies are often overtaken by smaller entrants that leverage new technologies or business model (Christensen et al., 2015). Other researchers support and expand the theory, Govindarajan and Kopalie (2006) note that disruptive innovations underperform on traditional metrics but offer new benefits such as affordability and convenience. Yu and Hang (2010) opined that disruptive innovations create new market structures by enabling new consumption patterns and by redistributing competitive advantage.

In the Fintech industry, disruptive innovation is reflected in how technologies such as mobile payments, Block chain, USSD banking and digital lending began by targeting unbanked and low-income population and customer who use the traditional banking institutions. As these technologies improved, they diffused into mainstream banking, challenging traditional financial institutions and altering service delivery systems (Adetunji and Ogunsanya, 2020; Oshora and Chibuzor, 2022). Digital technologies such as mobile banking, USSD platforms, Block chain and digital payment system initially targeted consumers who were excluded from traditional banking- those without bank accounts, access to branches or steady internet connections. These technologies embody the "low-end entry" and "new market foothold" described by Christensen as they offer simple, convenient and cost-effective financial solutions (Oshora and Chibuzor, 2022).

As these technologies improved in reliability and functionality, they began to attract mainstream customers and increasingly posed competitive pressure on traditional banks. These mirrors Christensen and Raynor (2003) assertion that disruptive product gradually ascend the performance ladder until they indirectly challenged the incumbent. Today, digital payment platform such as Opay, Palmpay, Paga, Remita and bank-led mobile applications are widely used across urban and rural Nigeria, demonstrating the theory's progression path from low-end disruption to market-wide adoption.

Resource-Based View Theory

The Resource-Based Theory (RBV) originally proposed by Werner felt (1984) and later expanded by Barney (1991), is a strategic management theory that explains how firms achieve sustainable competitive sustainable competitive advantage by possessing and effectively deploying valuable, rare, inimitable and non-substitutable (VRIN) resources. RBV argues that competitive performance is not driven solely by external market conditions, but by internal strategic resources that allows firms to differentiate themselves and outperform competitors.

According to Barney (1991), resources includes physical assets, human capital and organizational capabilities that enables a firm to conceive and implement value-creating strategies. These resources must be valuable which contribute to efficiency or effectiveness, rare for it is not widely possed by competitors, inimitable since it is difficult to copy or replicate and non-substitutable which ensures that its resources cannot be replaced with alternative resources.

In Fintech, digital technologies (mobile platforms, Block chain, data analytics, cloud computing, USSD systems) are valuable and rare resources that create significant operational advantages. Firms with superior technological capabilities are better positioned to compete, innovate and disrupt traditional banking models. These technologies fit the VRIN characteristics when they are proprietary, difficult to imitate, or integrate into unique business models.

Digital technologies, financial innovations and operational efficiency represent strategic resources and capabilities that meet the VRIN criteria when effectively deployed. Fintech firms that invest in advanced technological infrastructure (e.g., AI, Block chain, API integration), create innovative financial products e.g. mobile micro-credit, peer-to-peer platforms), and build lean, highly efficient operational systems gain unique internal strengths that competitors are not easily replicable. From an RBV standpoint, disruptive innovation emerges when these internal resources are combined and leveraged in unique ways to create superior value for underserved or emerging market segments- an essential feature of disruptive innovation in developing economies. For example, Nigerian Fintech companies like Flutter wave, Mono and Opay utilize proprietary algorithms, platform capabilities and agile operational processes to reduce transaction costs, enhance service speed and offer inclusive financial solutions to low income or previously excluded populations. Such capabilities give them sustained competitive advantage over traditional banks.

3.0 Methods

The study employed a cross-sectional survey approach that allows the researchers to collect data from multiple respondents simultaneously using a structured questionnaire. A descriptive research design was utilised to survey employees from First Bank Plc. because of its pivotal role as a pioneer traditional commercial bank in Nigeria that incorporated technological innovations in its payment transactions and operations. The population for this study comprises two hundred and thirty (230) staff members employed at selected First Bank branches in Shomolu, Yaba and Ikeja Local Government areas of Lagos state. The selection of First Bank for this study is grounded in its significant contribution to the success of the Nigerian banking sector. The sample size for this study encompasses of three (3)selected First Bank

branches located in Shomolu, Yaba and Ikeja Local Government Areas of Lagos State, with the aim of reaching more than 80% of the total employees, including both managers and subordinates across various departments such as marketing, customer service, information technology, risk management and compliance, human resources, and operations.

To determine the sample size, the Yamane formula (1967) was applied, yielding a total of two hundred and one (201) respondents. The sampling technique utilized involves non-parametric analyses. Non parametric analysis relies on convenience sampling technique to select the bank and branches, while judgmental sampling technique was used to select the employees from the selected department in the bank. A quantitative method was adopted for data collection and a structured questionnaire with close ended questions divided into two (2) sections; Section A contains information on the demographic details of the respondents and section B with 20 questions to elicit information on the study constructs.

Ultimately, a total of two hundred and one (201) responses were received after administration, resulting to a total of 87.4% administration success rate with 12.6% responses discarded due to incomplete responses.All dimensions in the study demonstrated relatively high reliability, meeting the acceptable threshold of 0.70 as stated by Nunnally and Bernstein (1994). The adapted scales assess three constructs with Cronbach Alpha value of digital technologies (0.799), financial innovation (0.757), operational efficiency (0.748) and disruptive innovation (0.798) as captured on table 1.

Table 1: Measures of Constructs

The table shows an overview of the measures adopted/adapted in the research and its source

S/No	Variables	Constructs	Authors	No of Items	Cronbach Alpha
1	Independent Variables	Digital technologies	Gomber et al., (2018); Via, (2019)	5-Items	0.847
2.		Financial Innovations	Akomea-Frimpong et al., (2019); Beck et al., (2016)	5-Items	0.822
3.		Operational Efficiency	Brescani et al., (2012); Osei et al., (2023); Kou and Lu, (2025)	5-Items	0.827
4.	Dependent Variables	Disruptive Innovation		5-Items	0.847
Total Items					**20-Items** **0.872**

Source: Researchers Computation, (2025) SPSS Version 28

Each dimension of digital technologies, financial innovation, operational efficiency and disruptive innovation using a five-item scale, resulting in a total of 20 items adopted from authors stated in the table. The Cronbach alpha values for each construct, with the overall reliability at 0.872. This value exceeds the acceptable threshold of 0.7, indicating a strong level of homogeneity among the items (Hair et al., 2010).

Results

The results of the descriptive statistics are expressed with the demographic details of the respondents in table.

Table 2: Demographic Characteristics

Variables	Category	Frequency	Percentages (%)
Gender	Male	104	51.7%
	Female	97	48.3%
	Total	**201**	**100%**
Age	Below 25 years	38	18.9%
	26-30 years	85	42.3%
	31-35 years	40	19.9%
	36-40 years	30	14.9%
	41years & above	8	4.0%
	Total	**201**	**100%**
Marital Status	Single	79	39.3%
	Married	104	51.7%
	Divorced	8	4.0%
	Widowed	10	5.0%
	Total	**201**	**100%**
Educational Qualifications	SSCE/OND	28	13.9%
	BSc/HND	96	47.8%
	MBA/MSc	64	31.8%
	Others	13	6.5%
	Total	**201**	**100%**
Department	Customer service	43	21.4%
	Marketing	31	15.4%
	Information technology	41	20.4%
	Human Resources	42	20.9%
	Risk Management & compliance	44	21.9%
	Total	**201**	**100%**
Status in the Firm	Senior	43	21.4%
	Supervisory Staff	84	41.8%
	Junior Staff	76	37.8%
	Total	**201**	**100%**

Source: Field Survey (2025)

From Table 2 above, the socio-demographic analysis of Two hundred and one (201) respondents are presented. From the table, it is revealed that 104 (51.7%) respondents were male while 97 (48.3%) respondents are female. By implication therefore, majority of the respondents were male.

Also, in the case of the age of the respondents, 38 respondents representing (18.9%) were below 25years; 85 respondents representing (42.3%) were within 26 and 30years age bracket; 40 respondents representing (19.9%) were within 31 and 35years age bracket; 30 respondents representing (14.9%) were within 36 and 40 years while another 8 respondents representing (6.0%) were within 41years and above. It therefore implies that most of the respondents were within 26 and 30years age bracket.

In the case of educational qualification, 28 respondents representing (13.9%) had SSCE/OND or its equivalent; 96 respondents representing (47.8%) had BSc/HND; 64 respondents representing (31.8%) had MSc /MBA qualification while 13 respondents representing (6.5%) had other certificates apart from the afore-mentioned certificates.

Besides, in the case of the marital status, 79 respondents representing (39.3%) of the total respondents were single; 104 respondents representing (51.7%) were married; 8 respondents representing (4.0%) were divorced and 10 respondents representing (5%) were divorced. It therefore implies that majority of the respondents of this study were married and matured with marital obligations to handle financial operations.

The table reviewed the department with customer services at43 (21.4%), marketing 31 (15.4%), information technology 41(20.4%), human resources 42(20.9%) and risk management and compliance 44 (21.9%).While respondents status at work includes senior staff 43 (21.4%), supervisory staff 84 (41.8%) and junior staff 76(37.8%).

Correlation Analysis

Table 3: Result of Correlation Analysis of Respondents

Correlations					
		TI	DI	OE	F_I
TI	Pearson Correlation	1	.722**	.597**	.528**
	Sig. (2-tailed)		.000	.000	.000
	N	201	201	201	201
DI	Pearson Correlation	.722**	1	.638**	.595**
	Sig. (2-tailed)	.000		.000	.000
	N	201	201	201	201

OE	Pearson Correlation	.597**	.638**	1	.748**
	Sig. (2-tailed)	.000	.000		.000
	N	201	201	201	201
F_I	Pearson Correlation	.528**	.595**	.748**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	201	201	201	201

Source: Field Survey, (2025)

The table reveals the correlation analysis of the study construct, digital technology r = 0.722 is a stronger predictor of disruptive innovation. The correlation of operational efficiency r = 0.597 suggest a strong positive relationship between disruptive innovation and operational efficiency. The correlation coefficient for financial innovation with r = 0.528 indicate a strong and positive relationship. The results that all three variables significantly enhance disruptive innovation in Fintech Industry.

Hypothesis Tests

Hypothesis One: Digital technologies have a significant effect on disruptive innovation among Fintech institutions in Nigeria.

With model specification: DI = $\alpha + \beta_1 TI1\text{-}5 + \boldsymbol{\varepsilon}$

Table 4: Model Summary Result for Hypothesis One

Model Summary[b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.722[a]	.522	.519	.59300	.522	217.196	1	199	.000	1.935
a. Predictors: (Constant), DT										
b. Dependent Variable: DI										

Source: Field Survey, (2025)

The result of the analysis revealed the calculated R of 0.722 for digital technology; this shows a strong significant relationship between digital technology and disruptive innovation. The result revealed the value of the coefficient of determination (R^2) was 0.522, implying that 52.2% of the total variance in disruptive innovation can be explained by digital technologies. This suggests that there are other variables which accounted for the remaining 27.8% was not included in this study. In order to determine if a significant

relationship exists between digital technologies, the Durbin Watson result of 1.935 shows that there is no autocorrelation of the results.

Table5: ANOVA Result of Hypothesis One

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.376	1	76.376	217.196	.000[b]
	Residual	69.977	199	.352		
	Total	146.353	200			
a. Dependent Variable: DI						
b. Predictors: (Constant), TI						

Source: Field Survey, (2025)

The table 5 shows the analysis of variance (ANOVA) F-Statistics was also calculated. The result also reveal that the model calculated (F= 217.196; $p<0.05$) is significant, thus implying that digital technologies has a significant effect on disruptive innovation.

Table 6: T-Test Results of Hypothesis One

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.015	.158		6.438	.000					
	TI	.696	.047	.722	14.738	.000	.722	.722	.722	1.000	1.000
a. Dependent Variable: DI											

Source: Field Survey, (2025)

The analysis also examined whether the interaction of digital technologies is a significant predictor of disruptive innovation in Fintech sector. The results revealed that digital technologies ((β = .696; t = 14.738; $p<0.05$), with result of the variance inflation factor (VIF) and tolerance value at 1.000. indicates that there is no multicollinearity as stated by Weisburd and Chester, (2013).

Hypothesis Two: Financial innovations have a significant effect on disruptive innovation among Fintech institutions in Nigeria.
With model specification: DI = $\alpha + \beta_1 FI1\text{-}5+\boldsymbol{\varepsilon}$

Table 7: Model Summary Result for Hypothesis Two

Model Summary[b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.595[a]	.354	.350	.68948	.354	108.868	1	199	.000	2.183
a. Predictors: (Constant), F_I										
b. Dependent Variable: DI										

Source: Field Survey, (2025)

The result of the analysis revealed the calculated R of 0.594 for financial innovation; this shows a strong significant relationship between financial innovation and disruptive innovation. The result revealed the value of the coefficient of determination (R^2) was 0.354, implying that 35.4% of the total variance in disruptive innovation can be explained by financial innovation. This suggests that there are other variables which accounted for the remaining 64.6% was not included in this study. In order to determine if a significant relationship exists between financial innovations and disruptive innovation, the Durbin Watson result of 2.183 shows that there is no autocorrelation of the results.

Table 8: ANOVA Result of Hypothesis Two

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	51.753	1	51.753	108.868	.000[b]
	Residual	94.600	199	.475		
	Total	146.353	200			
a. Dependent Variable: DI						
b. Predictors: (Constant), F_I						

Source: Field Survey, (2025)

The table 5 shows the analysis of variance (ANOVA) F-Statistics was also calculated. The result also reveal that the model calculated (F= 108.868;

p<0.05) is significant, thus implying that financial innovation has a significant effect on disruptive innovation.

Table 8: T-Test Result of Hypothesis Two

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.757	.244		3.098	.002					
	F_I	.706	.068	.595	10.434	.000	.595	.595	.595	1.000	1.000
a. Dependent Variable: DI											

Source: Field Survey, (2025)

The analysis also examined whether the interaction of financial innovation is a significant predictor of disruptive innovation in Fintech sector. The results revealed that financial innovation ((β = .706; t = 10.434; p<0.05), with result of the variance inflation factor (VIF) and tolerance value at 1.000. indicates that there is no multicollinearity as stated by Weisburd and Chester, (2013).

Hypothesis Three: Operational efficiency has a significant effect on disruptive innovation among Fintech institutions in Nigeri

Table 9: Model Summary Result for Hypothesis Three

Model Summary[b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.638[a]	.406	.403	.66071	.406	136.255	1	199	.000	2.102
a. Predictors: (Constant), OE										
b. Dependent Variable: DI										

Source: Field Survey, (2025)

The result of the analysis revealed the calculated R of 0.638 for operational efficiency, this shows a strong significant relationship between operational efficiency and disruptive innovation. The result revealed the value of the coefficient of determination (R^2) was 0.406, implying that 40.6% of the total variance in disruptive innovation can be explained by operational efficiency. This suggests that there are other variables which accounted for the remaining

59.4% was not included in this study. In order to determine if a significant relationship exists between operational efficiency and disruptive innovation, the Durbin Watson result of 2.102 shows that there is no autocorrelation of the results.

Table 10: ANOVA Result of Hypothesis Three

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.481	1	59.481	136.255	.000[b]
	Residual	86.872	199	.437		
	Total	146.353	200			
a. Dependent Variable: DI						
b. Predictors: (Constant), OE						

Source: Field Survey, (2025)

The table 5 shows the analysis of variance (ANOVA) F-Statistics was also calculated. The result also reveal that the model calculated ($F= 136.2558$; $p<0.05$) is significant, thus implying that operational efficiency has a significant effect on disruptive innovation.

Table 11: T-Test Result of Hypothesis Three

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.601	.232		2.586	.010					
	OE	.751	.064	.638	11.673	.000	.638	.638	.638	1.000	1.000
a. Dependent Variable: DI											

Source: Field Survey, (2025)

The analysis also examined whether the interaction of operational efficiency is a significant predictor of disruptive innovation in Fintech sector. The results revealed that operational efficiency (($\beta = .751$; $t = 11.673$; $p<0.05$), with result of the variance inflation factor (VIF) and tolerance value at 1.000. indicates that there is no multicollinearity as stated by Weisburd and Chester, (2013).

Hypothesis Four: Digital technologies, financial innovations and operational efficiency have a joint significant effect on disruptive innovation among Fintech institutions in Nigeria.

Table 12: Regression Analysis of Hypothesis Four

Model Summary[b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.775[a]	.601	.595	.54447	.601	98.894	3	197	.000	2.085
a. Predictors: (Constant), F_I, TI, OE										
b. Dependent Variable: DI										

Source: Field Survey, (2025)

The result revealed the value of the coefficient of determination (R^2) was 0.601, implying that 60.1% of the total variance in disruptive innovation can be explained by digital technologies, financial innovations and operational efficiency. This suggests that there are other variables which accounted for the remaining 39.9% but was not included in this study. In order to determine if a significant relationship exist between digital technologies, financial innovations and operational efficiency.The Durbin Watson result of 2.085 shows that there is no autocorrelation of the results.

Table 13: ANOVA Results of Hypothesis Four

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	87.952	3	29.317	98.894	.000[b]
	Residual	58.401	197	.296		
	Total	146.353	200			
a. Dependent Variable: DI						
b. Predictors: (Constant), F_I, TI, OE						

Source: Field Survey, (2025)

The table 13 shows the analysis of variance (ANOVA) F-Statistics was also calculated. The result also reveal that the model calculated ($F= 98.894$; $p<0.05$) is significant, thus implying that digital technologies, financial innovation and operational efficiency has a significant joint effect on disruptive innovation.

Table 14: T-Test Results of Hypothesis Four

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.098	.206		.477	.634					
	TI	.490	.055	.509	8.973	.000	.722	.539	.404	.629	1.590
	OE	.240	.086	.204	2.802	.006	.638	.196	.126	.384	2.607
	F_I	.206	.081	.174	2.530	.012	.595	.177	.114	.430	2.326
a. Dependent Variable: DI											

Source: Field Survey, (2025)

The analysis also examined whether the interaction of digital technologies, financial innovation and operational efficiency was a significant predictor of disruptive innovation in Fintech sector. The results revealed that digital technologies ((β = .490; t = 8.973; p<0.05); operational efficiency (β = .240; t = 2.802; p>0.05); financial innovation (β = .206; t = 2.530; p>0.05). The result of the variance inflation factor (VIF) for digital technology was 1.590, operational efficiency 2.607 and financial inclusion 2.326 fell below the threshold of 0.1 to 10 as recommended by Hair et al., (2010). The tolerance value for digital technology was 0.629, operational efficiency 0.384 and financial inclusion 0.430 indicates that there is no multicollinearity as stated by Weisburd and Chester, (2013). The result reveals that digital technology, financial innovation and operational efficiency had a significant and joint effect on disruptive innovation in Fintech sector.

4.0 Discussion of Results

The study examined the effect of digital technology on disruptive innovation with hypothesis one result R^2= 0.522, (F-statistics= 217.196, P<0.05) and (β = 0.696; t = 14.738; p<0.05) revealing that higher level of digital technology are associated with substantial increase in disruptive innovation. This finding is supported by the works of Bharadwaj et al., (2013) who established that digital technologies strengthen organizational capabilities and significantly enhance performance. It also aligns with Vial, (2019) who emphasized that digital transformation improves processes and drives innovation outcomes in organization. Works of Chen at al., (2023) also confirmed that digital transformation has a strong positive influence on innovation performance.

Furthermore, Gaglio (2022) and Varzaru et al, (2024) study found that digitalization improves firm performance and innovation capacity across sectors. Together these studies affirm the strong positive effect of digital technology reflected in the regression results

The analysis revealed a moderate positive relationship between financial innovation and disruptive innovation with a correlation coefficient of r = 0.595, indicating that increases in financial innovation are associated with higher order levels of disruptive innovation. The regression results further showed that financial innovation explained 35.4% of the variance in disruptive innovation (R^2= 0.354). The overall model was significant at (F=108.868, P<0.05) and interaction at t-test – (β = 0.706; t = 10.434; p<0.05) confirming that the model provides a meaningful prediction and has a strong and statistically significant contribution to predicting disruptive innovation.

The result aligns with a growing body of empirical research which identified financial innovation enhances firms ability to adopt disruptive innovation with Nguyen, Phen and Le (2020) study that states that financial innovations strengthen firms' competitive advantage by enabling new product offerings and technology-driven processes, both of which stimulates disruptive outcomes in financial and non-financial sectors. Similarly, Adekoya and Adewale (2021) established that innovative financial instruments, mobile payment and digital banking platforms significantly promotes disruptive innovation among African financial service providers by lowering transaction barriers and enabling experimentation with new solutions.

In addition Frame, Wall and White (2019) demonstrate that financial innovation accelerates organisational transformation by supporting efficient resource allocation and adoption of digital solutions, thereby enabling firms to disrupt existing market structures. Arner, Barberis and Buckley (2017) study also confirmed that Fintech innovations such as Block chain, automated lending system and digital payment infrastructures are major drivers of disruptive innovation, transforming business processes and unlocking new value streams. While Kenechi and Nwosu (2022) study shows that financial innovation positively influences disruptive innovation in Nigerian service firms by improving accessibility, promoting operational flexibility and encouraging the creation of new service delivery channels.

The analysis result revealed a moderately strong positive correlation between operational efficiency and disruptive innovation with R= 0.638. This indicates that improvements in operational efficiency are associated with higher levels of disruptive innovation. The regression model further showed that operational efficiency accounted for 40.6% of variance in disruptive innovation (R^2= 0.406). The model was statistically significant, (F= 136.255,p<0.05), confirming that

operational efficiency is an important predictor of disruptive innovation. The standardized coefficient demonstrated that operational efficiency made a strong and significant positive contribution to disruptive innovation (β = .696; t = 14.738; p<0.05). This suggests that a one-standard deviation increase in operational efficiency in disruptive innovation. Consequently the hypothesis positively influences disruptive innovation. The result is supported by Al-Doghan and Sundram (2021) that found that operational efficiency significantly enhances firm's innovativeness, demonstrating that efficient operations directly support the development of new and transformative ideas. Lee (2015) study also aligns with the study when he reported that improvements in operational processes and systems positively influence organizational innovation processes. Nguyen and Phan (2020) study also shows that operational capabilities, including efficiency, stimulate innovation performance by improving resource utilization and enabling firms to pursue new technological opportunities. Research by Kenechi and Nwosu (2022) also agrees that operational improvements in the Nigerian firm are enhanced by the adoption of disruptive technologies and innovation.

The combined influence of digital technologies, financial innovations and operational efficiency on disruptive innovation was found to be statistically significant with the model explaining 60.1% of the variance in disruptive innovation (R^2 = 0.601). The overall regression model was significant (F= 98.894, p= 0.001), indicating that the three predictors jointly exert a strong explanatory effect. The individual contribution shows that digital technologies had the strongest effect (β = .490; t = 9.973; p<0.05), followed by operational efficiency (β = .240; t = 2.802; p<0.05) and financial innovation (β = .206; t = 2.530; p<0.05). These results demonstrate that while each variable independently influences disruptive innovation, their combined effect provides substantial predictive power. The study of Vial, 2019 aligns with the result of the study for he stated that digital transformation improves organizational agility and resource optimization, thereby enabling firms to adopt disruptive technologies more effectively. The study finding is also supported by Arner et al., (20170 they observed that financial innovations such as digital payments, Block chain and automated financing solutions play a crucial role in enabling radical market shifts and innovative business models.

Similarly, the research of Al-Doghan and Sundram (2021) had shown that operational efficiency strengthens innovation performance by lowering process bottlenecks, reducing costs and enabling faster implementation of technology-driven solutions. Additionally, study of Bharadwaj et al., (2013) noted that digital business strategies enhance innovation when complemented by efficient internal processes. The findings of the study aligns withKenechi and Nwosu

(2022) they confirmed that when operational efficiency and financial innovation interact with digital technology adoption, organisations exhibit higher level of disruptive innovation, particularly in emerging markets. These studies collectively reinforce the study results.

5.0 Conclusion and Recommendations

The study establishes that digital technologies, financial innovations and operational efficiency play significant roles in driving disruptive innovation within the Nigerian Fintech industry. The literature reviewed shows that Fintech firms are leveraging advanced digital tools including artificial intelligence, Block chain, mobile platform and cloud systems to deliver faster, cheaper and more accessible financial services. Financial innovations such as mobile payments, digital lending and savings applicable have expanded financial access among underserved population, thereby promoting financial inclusion. Furthermore, improved operational efficiency which involves streamlined processes, reduced transaction time and automated service delivery enhances customer satisfaction and strengthens the competitive advantage of Fintech firms.

The joint effect of digital technologies, financial innovation and operational efficiency contributes meaningfully to disruptive innovation, enabling Fintech firms to challenge traditional banking structures and reshape Nigeria's financial landscape. Fintech firms should increase investment in advanced digital technologies to enhance service delivery, strengthen operational efficiencies through automation, process integration, and modern data management systems. There must also be continuous development of innovative financial products that deepens financial inclusion to meet the needs of customers. Regulatory authorities should support innovation by expanding regulatory sandbox initiatives and strengthening collaborative frameworks

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