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Barriers, Risks, and Critical Success Factors of Digital Transformation Initiatives on Organisational Performance in the Nigerian Banking Industry

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ABSTRACT

This study examines the barriers, risks, and critical success factors (CSFs) of digital transformation (DT) initiatives and their relationship with organisational performance across Nigerian deposit money banks (DMBs). The investigation adopts a dual-strand methodology combining an integrative systematic review, reported in strict alignment with the PRISMA 2020 framework, with descriptive financial analyses of seven listed commercial banks over the 2019–2024 financial quinquennium, complemented by aggregate clearing and settlement metrics from the Nigeria Inter-Bank Settlement System (NIBSS). Systematic literature searches across public repositories and citation reference tracking yielded 35 records, of which 16 met the defined eligibility criteria and were synthesised. Cybersecurity was identified as the predominant operational and strategic risk (4 of 16 studies; 25.0%), whilst robust cybersecurity frameworks and modernised technology/digital infrastructure constituted the most prominent CSFs (4 of 16 studies each; 25.0%). Human and cultural barriers represented the most frequently identified impediment (3 of 16 studies; 18.8%), followed closely by infrastructural and technological constraints (2 of 16 studies; 12.5%). Among the six empirical studies examining financial outcomes, two established positive and statistically significant associations with return on assets (ROA), one documented mixed outcomes varying by payment channel, one observed an insignificant effect, and two did not report confirmed directional estimates. Across five banks with continuous longitudinal disclosures, mean ROA rose from 2.48% in 2019 to 3.48% in 2024. However, because this interval was marked by acute macroeconomic shocks, including substantial naira devaluations, elevated inflation, and foreign exchange (FX) revaluation gains, this profitability growth cannot be causally attributed to digital transformation on available evidence. The study recommends that the Central Bank of Nigeria (CBN) institute a regulatory sandbox conditioned upon stringent cybersecurity prerequisites, issue cyber-resilience benchmarks, and mandate disaggregated reporting of foreign exchange revaluation gains versus core operational earnings.

Keywords: Digital transformation; Organisational performance; Critical success factors; Cybersecurity risks; Deposit money banks; Return on assets; Financial technology.

1. INTRODUCTION

The banking sector worldwide has been fundamentally reshaped by rapid technological advancements. Digital Transformation defined as the pervasive integration of digital technologies across all functional operational domains, inducing structural adjustments in how institutions operate and deliver value to clients has evolved into an imperative strategic imperative for financial institutions globally (Verhoef et al., 2021). Nigerian deposit money banks (DMBs) have committed substantial capital expenditures towards electronic channels, including mobile banking applications, internet banking interfaces, point-of-sale (POS) terminal networks, and automated teller machine (ATM) infrastructures, to augment service delivery, enhance transactional throughput, and curtail operating overheads (Lottu et al., 2023).

Reflecting this intensive channel migration, aggregate digital transaction throughput within the domestic payment architecture has expanded exponentially. Clearing statistics published by the Nigeria Inter-Bank Settlement System (NIBSS) demonstrate that transaction volumes settled across the NIBSS Instant Payment (NIP) platform rose from 0.73 billion transactions in 2018 to 11 .20 billion in 2024, representing an aggregate transactional value expansion from ₦80.4 trillion to ₦1 ,070.0 trillion over the corresponding period (NIBSS, 2025). Nonetheless, whilst these macro-level metrics illustrate escalating sector-wide turnover, they reflect aggregate transactional velocity rather than firm-level operational efficiency, cost-to-income rationalisation, or risk-adjusted profitability.

Notwithstanding these volume expansions, the execution of digital transformation agendas within Nigerian DMBs continues to encounter formidable structural, environmental, and institutional impediments. Commercial institutions confront deficiencies spanning obsolete legacy computing infrastructure, severe talent flight, acute vulnerability to sophisticated cyber-fraud typologies, and institutional inertia (Ama et al., 2024; Eke, 2026). Given the capital-intensive nature of enterprise IT procurement, underperforming initiatives carry severe financial and stability repercussions for financial intermediaries and the wider banking ecosystem. While prior empirical inquiries have explored isolated facets such as chatbot adoption dynamics (Abdulquadri et al., 2021), managerial barriers to organisational change (Diener & Špaček, 2021), or narrow fintech-profitability links (Iserameiya et al., 2025) a rigorous, integrated synthesis appraising the multi-dimensional interplay of barriers, risks, CSFs, and empirical performance remains scarce.

This investigation bridges this empirical lacuna. The primary objectives are to: (1) identify the prevailing barriers impeding digital transformation execution across Nigerian DMBs; (2) examine the associated operational, strategic, and cyber risks; (3) determine the critical success factors governing execution efficacy; and (4) assess empirical evidence linking digital transformation to bank performance, categorised into financial, internal control, and operational outcomes.

2. LITERATURE REVIEW

2.1 Conceptual Framework

Digital transformation in financial intermediation extends beyond the elementary digitisation of paper instruments or the superficial digitalization of discrete manual workflows; it implies the holistic reconfiguration of core business architectures and value-creation mechanisms (Verhoef et al., 2021). Matt et al. (2015) formalise this paradigm across four cardinal dimensions: technological exploitation, alterations in value creation, structural organizational reconfiguration, and financial resource allocation. Within banking, this encompasses the deployment of cloud architectures, algorithmic credit scoring, microservices, and cryptographic payment rails (Lottu et al., 2023).

Barriers to transformation denote the systemic friction points hindering execution. In accord with the classic Technology-Organisation-Environment (TOE) paradigm (Tornatzky & Fleischer, 1990), these are categorised into technological barriers (brittle legacy mainframes, data silos), organisational barriers (managerial risk aversion, siloed culture), environmental barriers (regulatory compliance uncertainties), and individual barriers (digital literacy deficits amongst personnel and end-users). Within Nigeria, internal control vulnerabilities, insider fraud collusion, and low consumer awareness exacerbate vulnerability to electronic fraud (Ama et al., 2024), whilst talent attrition and foreign currency software licensing constraints restrict advanced artificial intelligence (AI) adoption (Eke, 2026).

Risks of transformation span strategic misalignment, system downtime, systemic third-party dependencies, and acute cybersecurity threats (Hassan et al., 2024). Prominent cyber-fraud typologies documented across Nigerian commercial banks include distributed denial of service (DDoS), credential stuffing, SIM-swap hijacks, ATM skimming, pharming, and social engineering attacks (Ama et al., 2024). Conversely, critical success factors (CSFs) denote the essential organizational, technological, and strategic prerequisites vital to initiative delivery, including transformative executive leadership, robust cybersecurity architectures, agile change management, and client-centric product design (Abbu et al., 2022; Al Maazmi et al., 2024).

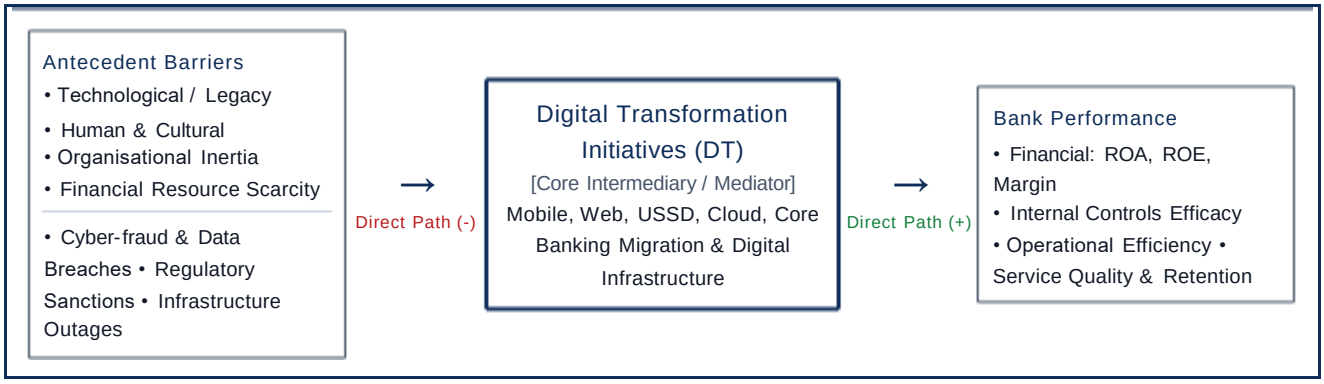




Figure 1 : Conceptual structural model of digital transformation barriers, risks, critical success factors, and bank performance.

Source: Synthesised by authors from TOE framework and dynamic capabilities literature.

2.2 Theoretical Foundations

The conceptual framework is anchored upon three theoretical pillars: (1) The Technology-Organisation-Environment (TOE) Framework (Tornatzky & Fleischer, 1990), providing an analytical typology to classify external regulatory imperatives, technological infrastructure bottlenecks, and firm-level competencies; (2) Dynamic Capabilities Theory (Teece, 2007), which explicates how banks orchestrate, sense, and reconfigure digital resources to navigate market turbulence and technology obsolescence; and (3) The Resource-Based View (RBV) (Barney, 1991), asserting that sustainable competitive advantage emerges only when digital capital is paired with inimitable organizational routines, cybersecurity resilience, and workforce digital proficiencies.

3. RESEARCH METHODOLOGY

The inquiry executes an integrative two-strand design. The qualitative-empirical strand adheres to the updated PRISMA 2020 protocol for systematic reviews (Page et al., 2021). The quantitative strand conducts panel descriptive analysis across seven listed Nigerian commercial banking institutions over the 2019–2024 financial quinquennium, juxtaposed against aggregate NIBSS payment data.

Systematic literature searches were conducted on 9 October 2026 across structured scholarly repositories and academic search engines, utilizing six Boolean query strings addressing: (Q1) digital transformation barriers in Nigerian DMBs; (Q2) cybersecurity risks in Nigerian digital banking; (Q3) digital banking critical success factors; (Q4) digital channels and bank ROA panel evidence; (Q5) systematic evidence on Nigerian financial sector digitalisation; and (Q6) fintech channels and quoted bank performance. Eligibility criteria restricted inclusion to verified peer-reviewed articles published in the English language between 2015 and 2026 addressing Nigerian commercial banking. Deduplication, manual title/abstract screening, and full-text eligibility appraisal reduced the initial yield of 35 identified records to a final synthesis cohort of 16 empirical studies (Figure 2).

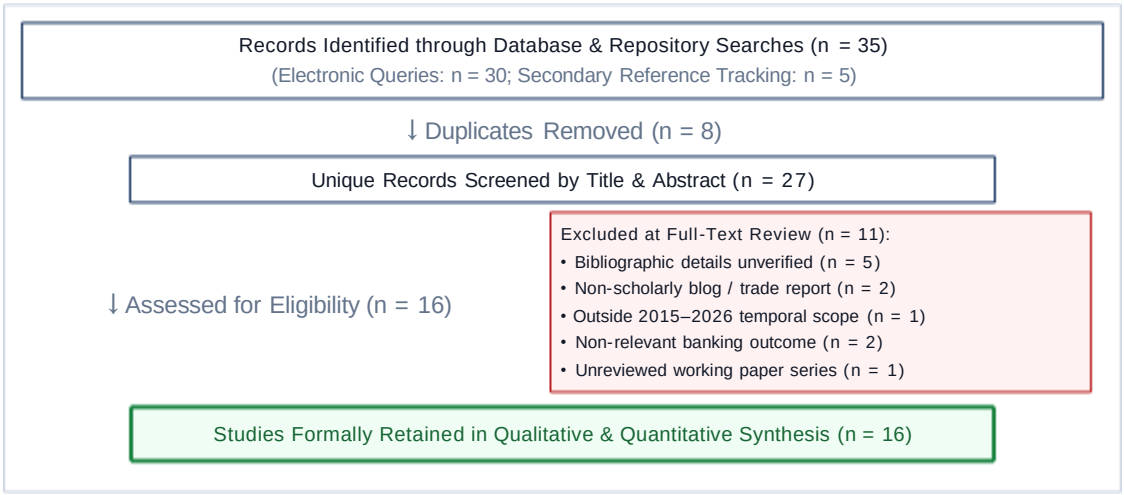


Figure 2: PRISMA 2020 flow diagram illustrating study identification, screening, and inclusion.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Aggregate Payment Turnover Trends

Table 1 presents the trajectory of NIP transaction volumes and settled values from 2018 to 2024. Compound annual growth rates (CAGR) stood at 57.6% for transaction volume and 53.9% for transactional value. While growth peaked in 2023 at 86.5% following the currency redesign policy, these sector-level figures represent payment turnover rather than the financial profitability of individual commercial banking institutions.

Table 1 : NIBSS Instant Payment (NIP) transactional throughput and clearing values in Nigeria (2018–2024).

Year	Transaction Volume (Billion)	Transaction Value (₦ Trillion)	Volume Growth (%)	Value Growth (%)
2018	0.73	80.4	—	—
2019	1 .20	120.5	64.4	49.9
2020	1 .99	162.9	65.8	35.2
2021	3.47	271 .9	74.4	66.9
2022	5.20	387.1	49.9	42.4
2023	9.70	600.0	86.5	55.0
2024	11 .20	1 ,070.0	15.5	78.3

Source: Compiled from Nigeria Inter-Bank Settlement System (NIBSS) Annual Industry Statistics (2025). The 2024 value is provisional and presented for descriptive turnover contextualisation.

4.2 Systematic Synthesis of Literature (n = 16 Studies)

Methodological quality appraisal using a six-point standardised rubric revealed that five studies exhibited High methodological rigour (scores 5.0–6.0), eight moderate rigour (scores 3.5–4.5), and three low rigour (narrative/conceptual overviews devoid of search protocols). Table 2 itemises the synthesis matrix across the 16 evaluated papers.

Table 2: Systematic evidence extraction matrix of included studies on digital transformation in Nigerian banking.

Study Citation	Setting & Sample	Methodological Design	Core Empirical Findings & Outcomes
Ama et al. (2024)	Staff of selected DMBs	Empirical survey; descriptive statistics	Identified cyber-fraud mechanisms (pharming, SIM swaps); linked vulnerabilities to internal control gaps and customer digital illiteracy.
Ayoade et al. (2025)	10 Nigerian DMBs (2009–2023)	Panel ARDL modeling	ATM and web payments exhibited statistically significant negative effects on price-earnings ratios; POS and mobile channels showed no significance.
Chukwu & Molokwu (2022)	Commercial banks (2010–2019)	Panel ARDL regression	Digital banking channels (POS, USSD, web) exhibited positive but statistically insignificant coefficients on bank ROA.
David et al. (2025)	Tier-1 banks (n = 397 staff)	Stratified descriptive survey	Cloud, application, and network security controls demonstrated positive, statistically significant fraud-mitigation impacts.
Eke (2026)	Banking sector (n = 97)	Cross-sectional questionnaire	AI-driven cyber-defence adoption is severely impeded by specialised talent shortages, software cost constraints, and legacy IT friction.
Enadeghe & Shaba (2025)	Deposit money banks (2013–2023)	Panel secondary econometric data	Evaluated digital channels against ROA; directional significance could not be conclusively validated from retrieved extracts.
Ezeocha (2024)	Nigerian digital banking	Narrative conceptual review	Reviewed retail payment infrastructure; lacked explicit empirical extraction parameters (retained for narrative context).
Garba et al. (2025)	Nigerian commercial banks	Conceptual review & content analysis	Constructed conceptual model linking e-service quality dimensions to consumer retention; provided no econometric effect sizes.

Study Citation	Setting & Sample	Methodological Design	Core Empirical Findings & Outcomes
Iserameiya et al. (2025)	10 listed DMBs (2014–2024)	Panel least squares estimation	Mobile and internet banking channels exerted positive and statistically significant impacts on ROA; POS was positive but insignificant.
Iwedi (2024a)	Commercial banks (time series)	Secondary econometric series	Appraised digital financial infrastructure against total asset expansion; parameters lacked verifiable significance markers in text.
Iwedi (2024b)	Commercial banking firms	Quasi-experimental time-series	Demonstrated that electronic funds transfer adoption Granger-causes bank operational efficiency improvements.
Kolawole et al. (2024)	Quoted commercial banks	Panel ARDL & Granger causality	Confirmed positive long-run cointegrating effects of agency banking (β = 0.128), ATM (β = 0.566), and web banking (β = 0.514) on ROA.
Lottu et al. (2023)	Nigerian financial sector	Narrative policy overview	Emphasised systemic cyber threats, personal data privacy risks, and regulatory compliance complexities under open banking.
Ojogbo & Odor (2025)	DMB executives (n = 250)	Multiple linear regression	Strategic digital leadership vision ($p < 0.001$) and digital capabilities significantly predicted successful transformation outcomes.
Olorunshola et al. (2026)	3 DMBs (UBA, Sterling, Union; n = 294)	Empirical survey regression	Employee resistance significantly constrained DT outcomes; change management exercised a positive moderating effect buffered by culture.
Yahaya (2025)	14 listed DMBs (2015–2024)	Random-effects panel regression	Digital transformation initiatives produced a statistically significant positive effect on internal control effectiveness (β = 0.52, $p < 0.001$).

4.3 Barriers, Risks, and Critical Success Factors

Cross-tabulation of coded factors across the 16 studies demonstrates distinctive distribution patterns (Tables 3, 4, and 5). Human and cultural resistance represented the primary barrier (18.8%), followed by technological/infrastructure constraints (12.5%) and organizational inertia (12.5%). Cybersecurity was the single most pervasive risk category (25.0%), reflecting rising attack sophistication. Correspondingly, cybersecurity frameworks (25.0%) and technology/digital infrastructure (25.0%) emerged as the cardinal critical success factors.

Table 3: Identified Barriers (n = 16).

Category	n	%
Human & Cultural	3	18.8
Technological	2	12.5
Organisational	2	12.5
Financial	1	6.3
Environmental	0	0.0

Table 4: Identified Risks (n = 16).

Category	n	%
Cybersecurity	4	25.0
Regulatory Compliance	1	6.3
Strategic Misalignment	0	0.0
Operational Failure	0	0.0
Reputational Damage	0	0.0

Table 5: Critical Success Factors (n = 16).

CSF Category	n	%
Cybersecurity Framework	4	25.0
Digital Infrastructure	4	25.0
Talent Development	2	12.5
Leadership Vision	2	12.5
Customer Centricity	2	12.5

Note: Denominator is 16 included studies. Percentages do not sum to 100% due to multi-category reporting across studies.

4.4 Performance Linkages and Secondary Panel Analysis

Table 6 synthesises the empirical directionality between digital transformation and institutional performance dimensions. Notably, financial performance metrics yielded divergent conclusions: two studies documented positive and significant links (Iserameiya et al., 2025; Kolawole et al., 2024), one recorded negative impacts for web/ATM channels on market valuation (Ayoade et al., 2025), and one found insignificant ROA gains (Chukwu & Molokwu, 2022). Conversely, internal control efficacy (Yahaya, 2025) and operational efficiency (Iwedi, 2024b) exhibited unequivocal positive relationships.

Table 6: Reported empirical effects of digital transformation initiatives across performance dimensions.

Performance Dimension	Studies (n)	Positive & Sig. (n)	Mixed / Channel (n)	Insignificant (n)
Financial Performance (ROA, P/E)	6	2	1	1
Operational Efficiency	1	1	0	0
Internal Control Efficacy	1	1	0	0
Customer Retention & Loyalty	1	0 (Conceptual)	0	0

Note: Two financial studies (Enadeghe & Shaba, 2025; Iwedi, 2024a) omitted confirmed statistical significance in text and are excluded from directional counts.

To contextualise these empirical claims against actual balance-sheet realities, secondary financial data spanning seven listed commercial banking groups were analysed (Table 7). For the five banks exhibiting complete six-year time series (GTCO, Zenith, Fidelity, FBNH, and Access), aggregate mean ROA expanded by 100 basis points from 2.48% in 2019 to 3.48% in 2024.

Table 7: Return on Assets (ROA = PAT / Year-End Total Assets, %) across listed Nigerian banking groups (2019–2024).

Banking Institution	2019	2020	2021	2022	2023	2024
Guaranty Trust Holding Co. (GTCO)	5.24	4.07	3.82	2.62	5.57	6.88
Zenith Bank Plc	3.29	2.72	2.59	1.82	3.32	3.45*
Fidelity Bank Plc	1.34	0.97	0.70	1.17	1.60	3.15
FBN Holdings Plc (First HoldCo)	1.19	1.17	1.69	1.29	1.83	2.35*
Access Holdings Plc	1.32	1.22	1.36	1.02	2.32	1.55
Stanbic IBTC Holdings Plc	n/a	n/a	n/a	2.67	2.73	3.26*
United Bank for Africa (UBA) Plc	n/a	n/a	n/a	n/a	n/a	2.53*
Mean (5 Banks with Full Data)	2.48	2.03	2.03	1.58	2.93	3.48
Median (5 Banks with Full Data)	1.34	1.22	1.69	1.29	2.32	3.15

Note: ROA computed as Profit After Tax (PAT) divided by Year-End Total Assets multiplied by 100. * Denotes provisional or abridged figures extracted from published preliminary filings. Values are based on group consolidated accounts.

4.5 Confounding Macroeconomic Realities

Crucially, the sharp escalation in nominal bank ROA observed in 2023 and 2024 must not be fallaciously attributed to digital transformation efficiency gains. This period coincided with three profound exogenous macroeconomic shocks in Nigeria: (1) the demonetisation and naira redesign crisis of Q1 2023, which forced artificial transaction surges through electronic rails; (2) massive official foreign exchange rate liberalisation and currency devaluations in mid-2023 and early 2024, resulting in colossal, non-operational FX revaluation gains for banks holding long net foreign-currency asset positions; and (3) hyper-inflationary pressures, which mechanically inflated nominal banking asset bases and gross transactional revenues. Because annual financial reports largely pooled these extraordinary revaluation windfalls into bottom-line earnings without standardized disaggregation, claiming that digital investments directly generated the ROA expansion is empirically unsubstantiated.

5. CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

The systematic evidence confirms that whilst digital transformation has transformed retail payment velocity and bolstered internal control mechanisms within Nigerian DMBs, its net financial performance effect remains empirically ambiguous. Cybersecurity emerges as the defining operational risk, compounded by human digital literacy deficiencies and infrastructure deficits. Strategic execution must therefore move beyond procurement of standalone software to encompass comprehensive organizational re-skilling, institutional change management, and robust cyber-defence architectures.

5.2 Policy and Managerial Recommendations

On the basis of the verified empirical findings, the following actionable measures are proffered:

To the Central Bank of Nigeria (CBN) and Regulatory Authorities:

1. Establish a Cybersecurity-Conditioned Regulatory Sandbox: The CBN should institute a structured fintech-testing sandbox where DMBs deploy novel algorithmic and mobile solutions under defined prudential waivers, conditioned strictly upon rigorous cyber-resilience audits.
2. Mandate Uniform Cyber-Resilience Benchmarks: Establish mandatory technical baselines enforcing end-to-end encryption standards, multi-factor authentication (MFA) on all clearing interfaces, and standardised public reporting of incident typologies.
3. Enforce Disaggregated Earnings Disclosures: Direct commercial banks to report FX revaluation gains, inflation-induced monetary adjustments, and non-operating windfalls strictly separately from core operational digital fee revenues to enhance financial transparency.
4. Coordinate Nationwide Financial Consumer Literacy: Sponsor public digital literacy initiatives to mitigate customer vulnerabilities to social engineering, SIM swaps, and credential phishing.

To the Executive Leadership of Deposit Money Banks:

5. Execute Phased Migration of Core Legacy Infrastructure: Formulate capital expenditure schedules to transition legacy mainframes towards secure cloud-native architectures while rationalising high-maintenance, low-yielding ATM terminals.
6. Institutionalise Structured Digital Re-Skilling Frameworks: Deploy continuous professional development programmes across IT, compliance, and branch personnel to bridge the talent deficit in cybersecurity and cloud management.
7. Embed Proactive Change Management Protocols: Incorporate psychometric change-readiness indices and transparent employee engagement programmes during software rollouts to alleviate staff resistance.
8. Adopt Activity-Based Cost Accounting for Electronic Channels: Implement granular cost-accounting frameworks tracking operational maintenance costs versus fee generation per digital channel to isolate true return on IT investment.

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