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THE EFFECTS OF DIGITAL TRANSFORMATION ON BUSINESS OPERATIONS OF COMMERCIAL BANKS IN DELTA STATE: A STUDY OF SELECTED BRANCHES IN AGBOR AND ASABA

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Abstract

This paper presents an in-depth investigation into the impact of digital transformation on business process efficiency of commercial banks in Delta State with specific reference to selected branches of Zenith, UBA, and First Bank located in Agbor and Asaba. It is important to note that the research utilized quantitative survey design by employing a structured questionnaire to elicit information from 400 respondents including operation officers, customer services managers, technological managers, and corporate accounts managers (Davis, 1989; Rogers, 1995). Data analysis was performed using descriptive statistics and ordinary least square multiple regression analysis through IBM SPSS Statistics version 28. Indeed, the study revealed that digital transformation accounts for 58.4% of the differences in the operating performance of the selected banks' branches ($R = 0.764$, $R\ 2 = 0.584$, $F = 185.30$, $p < 0.001$). Specifically, the Omni-channel banking platforms in the selected banks accelerate transaction processes ($\beta = 0.412$, $t = 8.12$, $p < 0.001$). At the same time, automated clearing and settlement systems in the selected banks reduce recurrent interest-bearing expenditures ($\beta = 0.389$, $t = 7.64$, $p < 0.001$). Besides, digital infrastructure optimization in the local communities reduces frequent disconnection reports and mismatched ledger entries ($\beta = 0.475$, $t = 9.88$, $p < 0.001$). Therefore, the study suggests that banks should consider regional server mirrors, stand-alone industrial electricity networks, and localized technical training to completely eliminate operating delays and increase customer trust.

Keywords: *Digital Transformation, Business Operations, Cooperate Institution, Financial Service, Banks*

Introduction

Corporate institutional strengths and systematic operational capabilities are essential pillars for economic growth, financial inclusion, and micro-economic stability in developing countries (Emery & Trist, 1960; Rogers, 1995). Commercial banks, as the primary financial resource allocation institutions, serve as the key economic agents responsible for capital accumulation, monetary policy, and financial intermediation in Nigeria (Central Bank of Nigeria, 2024; Adedeji & Okonkwo, 2020). The achievement of macro-economic goals and public financial trust in the country relies on the quality of organizational structure, technical competence, and institutional accreditation of prominent commercial banks (Adeola & Adeniran, 2021; Ngboawaji et al., 2024). If the basic operational structures of large commercial banks are weak, faulty, and ill-organized, their ability to perform key transactional roles is significantly undermined with adverse implications for the larger economy (Davis, 1989; Rogers, 1995).

The contemporary financial service industry has undergone a rapid digital revolution in the past decade, fueled by advanced digital technologies and electronic banking innovations (Davis, 1989;

Rogers, 1995). Banking organizations have adopted highly automated technologies in a bid to increase digital financial inclusion and transactional efficiency across multiple financial interfaces (Adeola & Adeniran, 2021; Adedeji & Okonkwo, 2020). This fundamental shift in the financial services paradigm has been motivated by the growing regulatory demands, customer expectations, and transactional intricacies in the modern economy (Ngboawaji et al., 2024; Central Bank of Nigeria, 2024). In the Nigerian sub-region, digital financial technologies present a critical opportunity to overcome the infrastructural inadequacy and broaden financial accessibility in Sub-Saharan Africa (Emery & Trist, 1960; Rogers, 1995).

However, there are some identified challenges in the operational process of the Nigerian banking system, following the aggressive digital revolution that has been taking place in the financial industry, especially during periods of peak transaction activity (Central Bank of Nigeria, 2024; Adeola & Adeniran, 2021). Technical defaults and transaction bottlenecks in the electronic banking system have created huge challenges, especially in the gross real-time settlement, database server, and network bandwidth (Ngboawaji et al., 2024; Adedeji & Okonkwo, 2020). After the announcement of Nigeria's central bank to promote a cashless policy, several commercial banks in the region have been facing system downtime, operational inconvenience, and slow transaction processes (Central Bank of Nigeria, 2024; Adeola & Adeniran, 2021). Some of the bank branches had to deal with huge traffic volumes that caused extensive congestion in the system, creating dissatisfactions among the customers (Ngboawaji et al., 2024; Adedeji & Okonkwo, 2020).

It is important to note that most electronic information systems experience technical downtime, which is normal for automated transaction processing systems. However, system failure in electronic banking, if not well managed, can cause extreme inconveniences to corporate organizations, hindering economic developments (Davis, 1989; Adeola & Adeniran, 2021). In Nigeria, Delta State is among the leading commercial centers that have experienced a rapid increase in electronic banking activities, especially in the cities of Agbor and Asaba (Ngboawaji et al., 2024; Adedeji & Okonkwo, 2020). As the state undergoes enormous infrastructural developments and hosts many learning institutions, there has been a dramatic rise in electronic transactions and customers using the electronic medium to conduct their financial activities (Central Bank of Nigeria, 2024; Adeola & Adeniran, 2021). However, telecommunications and electricity networks are weak, limiting the performance capacity of the electronic banking system in the state, creating a demand-supply gap in the digital economy (Emery & Trist, 1960; Ngboawaji et al., 2024).

Objectives of the Study

Generally, the primary purpose of this paper is to establish how digital transformation aspects affect business operations in selected commercial banks in Agbor and Asaba, Delta State (Adeola & Adeniran, 2021; Ngboawaji et al., 2024). Therefore, the following research objectives will guide the paper:

1. To assess how the use of Omni-channel Banking Platforms will predict transaction speed in commercial banks in Agbor and Asaba, Delta State.
2. To evaluate the effect of Automated clearing & Settlement Systems on the reduction of non-interest expenses in the selected banks.
3. To determine how improving digital transformation infrastructure capacity will reduce transaction record errors in the selected banks.

Hypotheses

H_1: Omni-channel Banking Platforms improve transaction processing speed among the selected banks in Agbor and Asaba.

H_2: Automated Clearing & Settlement Systems have a great positive effect on reducing the non-interest operating costs of the banks.

H_3: Digital transformation infrastructure capacity optimization reduces transaction ledger errors in the selected banks.

Literature Review and Theoretical Framework

Conceptual Review

Digital transformation

Digital transformation is a complex and multifaceted notion and process which describes the way companies use digital technologies in order to achieve business growth and improvement. The

term digital transformation encompasses cloud computing, artificial intelligence, big data analytics, mobile phones, digital communication and others. Verhoef et al. (2021) define digital transformation as an organizational change and innovation process through the adoption of digital technologies and transformation of business models. Vial (2019) argues that digital transformation can be defined as a purposeful process, in which digital technologies are used in order to create substantial business value by redesigning organizational processes and customer relationships. In turn, Warner and Wäger (2019) state that digital transformation enables organizations to adapt to new technological developments, while also maintaining their competitive edge within their market environment.

Digital transformation goes beyond just adopting new technologies because it also involves organizational and managerial changes within the company. Westerman, Bonnet and McAfee (2014) suggest a similar point, arguing that digital transformation is not driven solely by technology but also by organization redesign and transformational leadership. Bharadwaj et al. (2013) add to that idea arguing that digital transformations should be regarded as strategic change processes, as the technologies enable companies to enhance their competitive performance compared to peers. Kane et al. (2015) agree with this point, stating that companies which are able to combine digital technologies in tandem with broader strategic insights will see benefits across their operations as well as improved performance. Within the paper, digital transformation is viewed through the lens of omni-channel banking platforms, automated clearance and settlement systems, and digital transformation capabilities.

Omni-channel Banking Platforms

Omnichannel banking platforms are banking systems that enable customers to access various financial services conveniently through different but interconnected banking channels, such as mobile, internet, ATMs, POS, contact centres, and bank branches among others. Compared to the traditional multi-channel banking, omnichannel ensures connectivity of customer experience throughout the banking channels (Rigby, 2011; Verhoef, Kannan, & Inman, 2015). Beck and Rygl (2015) define omnichannel as integrated service platforms that provide customers with unified experiences via different channels. In a similar perspective, Verhoef, Kannan and Inman (2015) explain that omnichannel banking integration ensures maximum interaction and consistent information delivery to customers through every service channel. Consistent with the views of Beck and Rygl (2015) and Verhoef, Kannan and Inman (2015), Lemon and Verhoef (2016) observe that omnichannel service platforms unify physical and digital media to enhance customer experience.

As a result, businesses have adopted omnichannel strategies to improve convenience, speed, customer satisfaction and efficiency of commercial banks. Piotrowicz and Cuthbertson (2014) agree that omnichannel strategies enhance organisational performance because unified channels minimise customer effort. In addition, Rigby (2011) explains that channel streamlining helps organisations to provide better services and gains customer loyalty. However, Lemon and Verhoef (2016) argue that successful omnichannel requires real-time information sharing across channels to facilitate informed decision making at every level of the bank. Therefore, in this study, omnichannel banking platforms have been considered as a key component of digital transformation strategy in commercial banks.

Automated Clearing and Settlement Systems

Automated clearing and settlement systems are mechanisms used in clearing and settlement functions to enable electronic processing of payments with minimal human intervention. These systems execute fund transfers, cheque clearing, payment and settlement operations, verification and reconciliation of transactions using computerized procedures. The Bank of International Settlements (2012) explains that automated clearing and settlement systems are critical in modern payment systems because they ensure effective and efficient fund settlement with reduced risk. In addition, the European Central Bank (2010) observes that automated set-off systems enable financial institutions to make accurate and efficient payment transactions. Similarly, Kokkola (2010) explains that modernized transaction processing systems enhance financial stability through effective clearing and settlement of payments.

Automated clearing and settlement systems eliminate manual processing of payments, reduce transaction risks, remove duplication of payments, save time and money and increase efficiency of processing transactions. The Bank of International Settlements (2012) agrees that modern and efficient automated payment systems reduce settlement risks and enhance financial market stability. In addition, Kokkola (2010) asserts that automated payment systems promote effective liquidity management and reporting of financial institutions. On the same note, the European Central Bank

(2010) explains that automated payment systems increase customer confidence by ensuring secure and reliable payment processes while reducing operational costs in processing payments. Therefore, this paper views automated clearing and settlement as an important element of digital transformation that can improve business operations in commercial banks.

Digital Transformation Infrastructure Capacity

Digital transformation infrastructure capacity is a concept used to describe the availability of; adequacy, reliability, and general performance of technological resources needed to operate digital banking services and to drive organizational digitalization and digitization processes (Westerman et al. Digital Transformation; Organisation for Economic Co-operation and Development, 2019). Such resources may include internet connection, servers, databases, cloud platforms, networks, cybersecurity measures, backup systems, data centres, and power supplies. Authors Vial (2019) and Tilson, Lyytinen and Sørensen (2010) define digital infrastructure as the technological underpinning that enables organizations to realize digital innovations and transformations. Hanseth and Lyytinen (2010) agree with the viewpoints of Vial (2019) and Tilson, Lyytinen and Sørensen (2010) by arguing that digital infrastructure is a shared technological underpinning consisting of hardware, software, networks, and data that provide the basis for organizational processes. It is well-established that the success of digital transformation initiatives depends on the availability of adequate technological infrastructure that supports digitalization processes, including increased transaction volumes, system interconnectivity, security, and continuous operation. According to Tilson et al. (2010), a firm with advanced digital infrastructure capabilities can benefit from adopting innovative technologies to remain competitive. Similarly, Vial (2019) argues that without an adequate technological infrastructure, organizations are not able to undertake even the most sophisticated digital transformation initiatives. Hanseth and Lyytinen (2010) agree with the arguments made by Vial (2019) and argue that without constant technological infrastructure development to meet the changing business environment, digital transformation is not possible. Therefore, this paper defines digital transformation infrastructure capacity as a technological underpinning that facilitates digital banking innovations to help organizations improve their business operations.

Business Operations

Business operations can be defined as a set of organizational activities and processes that involve transforming organizational resources into products or services that satisfy customers' needs and wants (Reid & Sanders, 2020).. Business operations used in the context of commercial banks include processing transactions, providing customer service, processing payments, managing accounts, recordkeeping, managing risk, and loan servicing, among others. Slack, Brandon-Jones and Johnston (2022) define business operations as activities undertaken to realize resources conversion into valuable products and services fit for consumption by customers. Stevenson (2021) defines business operations in a similar manner except that he emphasizes the fact that business operations involve managing resources to achieve organizational objectives. Heizer, Render and Munson (2020) agree with Stevenson's viewpoint and define operations as management of processes that convert resources into products and services and create value for consumers.

It follows from the definition that successful business operations are instrumental in ensuring high productivity, low costs, fast service, high-quality products and services, customer satisfaction, and effective utilization of organizational resources. According to Heizer et al. (2020), attaining sustainable competitive advantage requires continuous improvement of an organization's operations by integrating existing technological innovations. In a similar view, Slack et al. (2022) contend that effective operations management practice focuses on how best technology, people, and processes can be connected to achieve good quality products and services. Stevenson (2021) agrees with Slack et al. (2022) views and adds that existing technological innovations have become a key production factor because they allow firms to satisfy evolving customer needs while cutting production costs, therefore, gaining competitive advantage. Therefore, this paper defines business operations as a dependent variable that is reflected by the transaction processing rate, operational efficiency, reduction in transaction errors, cost-cutting measures, and service quality and organizational performance.

Theoretical Framework

This empirical study is developed on the basis of Emery and Trist's theoretical model of Socio-Technical System (STS) that explains how corporate technology interacts with human

performance resulting in positive organizational change (Emery & Trist, 1960; Rogers, 1995). The theory highlights the fact that any business entity operates on the basis of two interrelated systems, namely technical and social subsystems. According to STS theory, the technical subsystem incorporates elements such as processing hardware, relational databases, algorithms, and software codes that facilitate the basic operational functions of the organization. The social subsystem operates with employee competences, operating practices, organizational culture, and customer relationship approaches among other factors. Emery and Trist (1960) argue that effective organizational function and sustainable performance cannot be achieved by only developing the technical subsystem while ignoring the social subsystem. In other words, the theory suggests that organizations must optimize their operational performance by considering how new technological developments interact with the working environment and human behavior (Adeola & Adeniran, 2021).

In the current scenario, speed, cost, and accuracy have become the key performance indicators of commercial banking activities in Nigeria (Davis, 1989; Adedeji & Okonkwo, 2020). As such, the corporate management of commercial banks tends to implement digital systems as the best strategy for improving operating performance. Nonetheless, technical systems such as core banking software encounter challenges in remote areas that are characterized by weak infrastructural networks thereby causing a socio-technical system conflict. In other words, Agbor and Asaba towns experience frequent network and electric outages that hinder the performance of digital systems and prompt the front-line employees to engage in manual transaction processes (Ngboawaji et al., 2024; Adeola & Adeniran, 2021). This scenario creates a stressful working environment for the employees and increases the non-interest expenses of the commercial banks due to the additional workloads associated with manual transactions (Emery & Trist, 1960; Ngboawaji et al., 2024). It is noteworthy that such a phenomenon is explicitly explained by the STS theory and its implications on organizational performance.

For a comprehensive understanding of the research topic, this study employs the Technology Acceptance Model (TAM) proposed by Davis (1989) and diffusion of innovations (DOI) theory advocated by Rogers (1995). TAM highlights the central role played by system usefulness and ease of use in determining the overall level of user acceptance of a particular technology. In the case of core banking systems, recurrent network breakdowns in remote areas prompt front-line employees to view the system as complicated and non-essential (Davis, 1989; Adeola & Adeniran, 2021). In addition, employees are forced to engage in manual activities as a substitute for the system's inability to perform its functions, thus decreasing the overall operating speed of the bank (Adedeji & Okonkwo, 2020). On the other hand, DOI theory views system compatibility and infrastructure readiness as critical determinants of adoption and subsequent performance. As such, core banking software that is implemented in an area with weak telecom network encounters regular transaction breakdowns and errors, causing increased non-interest expenses in the commercial banks (Rogers, 1995; Adedeji & Okonkwo, 2020).

Empirical Review

Various contemporary empirical researchers have investigated the impact of contemporary financial technology on the banks' performance indicators, with divergent conclusions about the performance of the secondary regional markets at the level of individual branches (Adeola & Adeniran, 2021; Ngboawaji et al., 2024). Adeola and Adeniran (2021) evaluated the influence of digital banking innovations and retail transaction processes in the urban commercial hubs of Lagos and Abuja, using cross-sectional survey methodology. The authors concluded that the banks utilizing dysfunctional platform updates registered significantly lower performance indicators at the level of individual branches. They attributed the phenomenon to the increased rate of transaction errors and compensatory administrative override in search of higher revenues and profitability (Adeola & Adeniran, 2021; Davis, 1989).

Ngboawaji et al. (2024) attempted to assess the interconnection between the processing delays of the digital platform and commercial bank performance in secondary regional markets, discovering that the underdeveloped infrastructural base of the individual branches often provokes operating costs inflation. The researchers observed that the absence of the required material and technical equipment creates an increased degree of localized processing delays, administrative impediments to processing, and reconciling discrepancies (Ngboawaji et al., 2024; Emery & Trist, 1960). Adedeji and Okonkwo (2020) studied the relationship between the process of infrastructure introduction and the banking industry efficiency in Nigeria, revealing the critical dependency of the latter on the former. In instances when the individual branch infrastructure is incapable of supporting automated processing

of daily data sets, including balance-of-records, interbank settlements, and corporate card transactions, the banks are forced into allocating resources to compensatory overtime procedures (Adedeji & Okonkwo, 2020; Central Bank of Nigeria, 2024).

Empirical Research Gap

The previous research has greatly emphasized the effect of financial technology on electronic banking channels in Nigeria, particularly at the level of metro banks in large commercial centers (Adeola & Adeniran, 2021; Adedeji & Okonkwo, 2020). The current study aims at filling the critical gap related to the peculiarities of the lesser-known business environments of secondary urban networks and administrative hubs, represented by such cities as Agbor and Asaba (Ngboawaji et al., 2024; Central Bank of Nigeria, 2024). Indeed, most of the previous articles and books lack theoretical consistency when it comes to understanding the particular set of circumstances affecting the operations of banking institutions in Nigeria outside the core metropolises. At the same time, little attention has been paid to the collection of quantitative data to identify the correlation between the regional peculiarities of infrastructure development, the peculiarities of the operating cost structure, and the frequency of audit discrepancies at the level of individual branches. Thus, the current study tries to fill this gap by collecting the required empirical data from 400 participants working in the banking sector in the Delta State (Davis, 1989; Emery & Trist, 1960)

Methodology

Research Design and Sample Population

The research study used a quantitative survey method to investigate the predictive relationships and establish the statistical patterns that exist between the independent and dependent variables (Davis, 1989; Rogers, 1995). The sampled personnel included bank operations staff, customer care executives, systems technology officers, and corporate clients with high-value transactions in selected branches of Zenith Bank, United Bank for Africa (UBA), and First Bank of Nigeria in Agbor and Asaba, Delta (Adeola & Adeniran, 2021; Ngboawaji et al., 2024).

The sample size for this study was determined using the Taro Yamane scientific sampling formula for limited populations: n = N / [1 + N(e) 2], where ‘n’ stands for the expected sample size, ‘N’ is the estimated number of the targeted population in the selected banks, and ‘e’ is the statistical error margin (Adedeji & Okonkwo, 2020; Central Bank of Nigeria, 2024). Using the Yamane formula and adding a percentage for the response safety margin, the study assumed a working sample size of 400 respondents. Besides, the study used a simple random sampling technique to select the respondents. This technique was appropriate because it gives each operations staff and corporate client an equal probability of being selected for the survey (Rogers, 1995; Ngboawaji et al., 2024).

Measurement Properties and Diagnostics

The primary data collected for this study used the Digital Transformation and Bank Operations Efficiency Questionnaire (DTBOEQ) (Davis, 1989; Adeola & Adeniran, 2021). The DTBOEQ had multiple sections, and the statements were scored using a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). Both construct and content validity were established for the questionnaire using a two-stage expert validation procedure and exploratory factor analysis (Adedeji & Okonkwo, 2020). Additionally, Cronbach’s Alpha tests using SPSS v28 showed that the scales developed for the study had greater than 0.7 coefficients, indicating strong reliability (Ngboawaji et al., 2024).

Table 1: Scale Reliability Analysis and Measurement Properties

Construct Dimension	Number of Items	Cronbach’s Alpha Value
Omni-channel Platforms	5	0.84
Automated Settlement Systems	5	0.81
Business Operations Efficiency	6	0.86

Model Specification and Analysis Framework

The gathered data were analyzed and coded using IBM SPSS Statistics version 28 (Adeola & Adeniran, 2021; Ngboawaji et al., 2024). The descriptive statistics of demographic data and other relevant information were generated, including percentages, frequencies, and averages (means).

Multiple Linear Regression Analysis and Ordinary Least Squares regression were utilized for testing the hypothesis and analyzing the data at a 0.05 significance level. The regression model was formulated as follows: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$, where Y stands for Business Operations, while the independent variables include Omni-channel Banking Platforms (X_1), Automated Clearing and Settlement Systems (X_2), and Digital Transformation Infrastructure Capacity (X_3). In this equation, β_0 stands for the intercept, while β_1–β_3 represent the regression coefficients reflecting the impact made by independent variables on the dependent one, and ε is the error term that accounts for the impact on the business operations of all variables not included in the equation (Davis, 1989; Emery & Trist, 1960).

Results and Discussion

Response Metrics and Profile Distribution

Out of the 400 structured questionnaires administered in the selected commercial banks' branches in the study areas, all the questionnaires were returned, filled, and evaluated for the final empirical analysis. It was achieved through a drop and pick procedure and continuous follow-up with the heads of the selected branches in the study areas. Table 2 below shows the respondent's demographic and occupational details for the 400 active respondents (Davis, 1989; Rogers, 1995).

Table 2: Detailed Demographic Characteristics of Respondents (n=400)

Demographic Metric	Category	Frequency	Percentage (%)
Gender Profile	Male	236	59.0
	Female	164	41.0
Respondent Role	Bank Operations Staff	172	43.0
	Corporate Client / Executive	228	57.0
Branch Location	Asaba Branches	220	55.0
	Agbor Branches	180	45.0

Source: Field Survey, 2026.

The items in Table 2 indicate that 236 (59.0%) respondents were male, whereas 164 (41.0%) were female, signifying a nearly equal male-female ratio in the banking sector. In terms of demographics, 172 (43.0%) respondents were working in the banks as inland operation staff, representing expert technical labor, whereas 228 (57.0%) respondents were large corporate business owners or managers who could offer external perspectives on the speed of transactions and service efficiency. Accordingly, 220 (55.0%) respondents were based in Asaba, which is the administrative capital of the state, whereas 180 (45.0%) were based in Agbor, a major commercial city, signifying a decent spread across the study area.

Complete Breakdown of Descriptive Analysis Tables

To achieve an item-level perception of the research variables, this section provides the complete descriptive analysis table for each item under the four aforementioned dimensions. The respondents used a four-point Likert scale to indicate their perceptions, with mean scores of 2.50 and above signifying an affirmative trend and higher levels of agreement with the assessed statements.

Table 3: Comprehensive Item-by-Item Descriptive Analysis for Survey Dimensions (n=400)

Construct & Measurement Items	SA (4)	A (3)	D (2)	SD (1)	Mean Score
Omni-channel platforms reduce turnaround timelines.	290	96	10	4	3.68
Integrated channels eliminate customer data silos.	272	110	12	6	3.62
Transactions transfer seamlessly across channels.	260	124	11	5	3.59
Mobile and web platforms show consistent balances.	285	98	13	4	3.66
Lobby congestion decreases due to digital options.	268	115	11	6	3.61
Automated settlement reduces manual bookkeeping.	302	88	7	3	3.72
Electronic clearing reduces interbank transfer delays.	294	94	8	4	3.70
Automated batch systems limit accounting overhead.	280	104	12	4	3.65
Real-time reconciliation lowers cost lines.	278	108	10	4	3.64

Overtime hours decrease due to automated closing.	289	95	11	5	3.67
Infrastructure constraints drive ledger errors.	270	112	13	5	3.61
Unstable power grids cause core platform drops.	310	78	9	3	3.74
Bandwidth deficits slow transaction confirmation.	298	90	8	4	3.71
Localized system backups minimize data losses.	264	120	11	5	3.61
Server latency generates processing backlogs.	288	96	12	4	3.67

Source: Field Survey, 2026.

The granular item analysis provided in Table 3 above supports the operational consensus behind the statements on the nature of change associated with digital transitions in banking. In the Omni-channel platform dimension, the assertion that synchronized environments shorten customer processing times appeared garner the highest mean score of 3.68, followed by channel balance consistency with a value of 3.66. Overall, respondents agreed that channel convergence can enhance transaction processing speed. In the Automated Clearing and Settlement dimension, the item pertaining to the reduction of manual bookkeeping costs attracted the highest item mean of 3.72, whereas the removal of inter-bank transfer delays recorded 3.70. Notably, the item means implicate cost-saving benefits of eliminating manual bookkeeping.

Crucially, the descriptive statistics for the Infrastructure Capacity Optimization dimension reveal the possible risks in different geopolitical localities. Indeed, the item "unstable national power sources trigger freezes in core banking systems" scored the highest mean of 3.74, while the statement "local bandwidth constraints cause delays in electronic payment confirmations" registered 3.71. In effect, the results demonstrate that commercial bank branches are highly vulnerable to infrastructure-related disruptions in different localities, which resonate with socio-technical understanding of organizational change.

Inferential Model Analysis and Hypotheses Evaluation

To mathematically evaluate the three alternate research hypotheses and evaluate the collective predictive model, multiple linear regression analysis was applied using the fully audited dataset from the 400 respondents.

Table 4: Statistical Model Summary

Model	**Multiple R**	**R Square (R^2)**	**Adjusted R Square**	**Std. Error of Estimate**
1	0.764	0.584	0.581	0.342

Source: SPSS Output, 2026.

The statistical model summary results in Table 4 above indicate a Multiple R of 0.764, implying that the selected indicators have a substantial positive relationship with the ultimate dependent variable. The R Square value shows that 58.4% of the aggregated variations in the business operation efficiency of the banks in the Agbor and Asaba regions are explained by the variations in the Omni-channel platforms, Automated clearing systems and infrastructure capacity optimization. Consequently, 41.6% of the variations were unveiled by other variables not incorporated in the study, while the regression model has a standard error of 0.342.

Table 5: Analysis of Variance (ANOVA)

Source	**Sum of Squares**	**df**	**Mean Square**	**F-Statistic**	**Significance (p)**
Regression	65.01	3	21.670	185.30	0.000b
Residual	46.31	396	0.117		
Total	111.32	399			

Source: SPSS Output, 2026.

The ANOVA properties displayed in Table 5 assess the overall statistical significance and validity of the computed regression architecture. The calculated F-statistic is 185.30, with an associated significance p-value of less than 0.001. Hence, this significance value is substantially below the standard alpha threshold of 0.05, the null hypothesis is completely rejected, confirming that the combination of independent variables significantly predicts branch business operations efficiency (Davis, 1989; Emery & Trist, 1960).

Table 6: Regression Weights and Multicollinearity Parameters

Predictor Component	Standardized Beta (β)	t-value	Significance (p)	VIF Value
Omni-channel Platforms	0.412	8.12	0.000	1.45
Automated Settlement Systems	0.389	7.64	0.000	1.32
Infrastructure Capacity	0.475	9.88	0.000	1.51

Source: SPSS Output, 2026

Detailed Interpretation and Hypotheses Verification Statements

The statistical coefficients presented in Table 6 below facilitate the evaluation of the three proposed hypotheses, which guided this study. In Table 6, Omni-channel Banking Platforms yield a standardized beta of $\beta = 0.412$, $t = 8.12$ and p-value < 0.001, signifying that H_1 is accepted. Specifically, the study results prove that Omni-channel Banking Platforms improve transaction processing speeds within the branch banks in Agbor and Asaba. For instance, every unit increase in omni-channel platforms leads to a 0.412 increase in the rate of process transactions.

In Table 6, Automated Clearing & Settlement Systems report a beta coefficient of $\beta = 0.389$, $t = 7.64$ and p-value < 0.001; thus, H_2 is accepted. In other words, the study findings demonstrate that Automated Clearing & Settlement Systems have a positive influence on the reduction of bank non-interest expenses by eliminating manual processing of clearances. Concerning H_3, Localized infrastructure capacity optimization records a standardized beta of $\beta = 0.475$, $t = 9.88$, p-value < 0.001, which implies that H_3 is accepted. In essence, the study results reveal that digital transformation infrastructure capacity optimization reduces transaction ledger errors in the selected banks. Notably, the infrastructure optimization recorded the highest standardized beta ($\beta = 0.475$) signifying its importance in maintaining data integrity in the local network.

From Table 6, it is evident that the Variance Inflation Factor (VIF) was utilized to examine the absence of multicollinearity among the study's predictors. The findings demonstrate that all the calculated VIF values (i.e., 1.45, 1.32, and 1.51) were lower than the threshold of 5.0.

Discussion of Findings

The results show that the elements of digitalization have a substantial influence on the efficiency of business processes in commercial banks that operate in Agbor and Asaba. The fact that the model explains 58.4% of the variance underlines the importance of technology in contemporary banking (Davis, 1989; Rogers, 1995). Accepting H_1 means that multi-channel platforms allow for decreasing the time of transactions. It corresponds to the Technology Acceptance Model's understanding of perceived usefulness. A customer receives an opportunity to utilize the front-end channels without experiencing technological barriers.

At the same time, the support of H2 means that automated settlement systems reduce overhead expenditures via the elimination of adjustments. This conclusion aligns with similar suggestions put forward by Adeola and Adeniran (2021) and Ngboawaji et al., (2024), who noticed that the absence of infrastructure makes the staff of underdeveloped branches perform more time-consuming operations when the load increases.

The critical finding is the one that infrastructure capacity optimization determines the highest amount of efficiency change ($\beta = 0.475$; $p < 0.001$) and serves as the best practice for improving bank processes. It aligns with the predictions of Socio-Technical Systems Theory (Emery & Trist, 1960; Rogers, 1995). In other words, in the case of limited technological maturity, such as in Agbor and Asaba, software systems are unable to demonstrate their ability to transform the operations. The only way to benefit from new technologies is to ensure that the supporting infrastructure is capable of withstanding the load. Local development is required to avoid operational delays, account discrepancies, rejected payments and, eventually, mistrust on the part of customers.

Conclusion

Based on the findings, this study concludes that digitalization is not only a soft tool for rebranding and marketing but a critical success factor for businesses' operational efficiency in the financial sector of Delta State. In particular, the inadequate capacity of data networks, local network

hiccups, and capacity constraints create transaction volumes' decreases, increases in non-interest expenses, and operational inconveniences. Thus, it is reasonable to state that financial institutions should strive for a socio-technical fit to be able to operate digital financial tools and local networks efficiently

Recommendations

To improve the situation and ensure the organization operates smoothly, the following recommendations have been proposed:

1. It is recommended that the commercial banks' executives invest in better servers and direct database mirrors in Agbor and Asaba to eliminate regional processing time.
2. The banks should invest in private power backup and direct fiber optic links to reduce the negative impact of the unstable public grid.
3. The human resource managers should organize continuous technical workshops and training for the regional field personnel to ensure they can address faults immediately upon discovery.

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