# Digital Transformation and Operational Efficiency in Fintech SMEs: A Study of Start-Ups in Yaba Tech Hub, Lagos, Nigeria

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## Abstract

Digital transformation is increasingly adopted and recognised as important for the seamless growth of SMEs in Nigeria. Numerous firms in the FinTech segment of the financial services sector face challenges in achieving sustainable operational efficiency. The study examines how digital transformation influences the operational efficiency of FinTech SMEs. It employed cloud computing, automation, artificial intelligence (AI), and digital marketing to measure the digital transformation. A cross-sectional survey design was employed, with a structured questionnaire used to collect data. The population comprises 171 employees of three FinTech firms: Kuda, Paga, and Advansio. The sample size was 120. The sample size was obtained using a multistage sampling technique (Stratified and simple random sampling), because the population was divided into strata, and each stratum was represented before administering the questionnaire. Data were analysed using descriptive statistics and factor analysis. Multiple regression and Pearson correlation analyses were utilised to test hypotheses. The results revealed high adoption levels across all four dimensions, indicating strong awareness of technology-driven operations. However, the correlation analysis showed no statistically significant relationships between any of the dimensions and operational efficiency ($p > 0.05$). Regression analysis further confirmed the results, with an $R^2$ of 0.005, indicating that only 0.5% of the variation in operational efficiency could be explained by the combined influence of the four dimensions. Indicating that digital transformation has no significant effect on the operational efficiency of FinTech SMEs. The findings reflect transitional challenges, such as fragmented system integration, inadequate training, and varying levels of adoption maturity. Finally, the findings reveal that digital transformation remains a vital enabler of long-term competitiveness. The study recommends that strategic alignment, continuous digital upskilling, integration of environmental context, and stronger leadership commitment should be adopted by FinTech SMEs

**Keywords:** Artificial Intelligence (AI), Automation Process, Cloud Computing, Digital Marketing, FinTech, Operational Efficiency.

## 1.0 Introduction

The rapid advancement of global technology has accelerated the growth of the digital economy, which continues to expand at an unprecedented rate. As a result, digital transformation has become a critical component of modern business operations. In the financial services sector in particular, it is widely recognised as a key driver of innovation, operational efficiency, and competitive advantage. Consequently, organisations are increasingly leveraging digital technologies to improve financial service delivery, streamline processes, and remain competitive in a rapidly evolving digital marketplace (Verhoef *et al*., 2021; Vial, 2019). Although the adoption, stages, and relevance of digital transformation tools among SMEs in Nigeria are increasing. Most businesses in the financial services technology (FinTech) subsector have failed in achieving stable operational efficiency. Digital transformation has progressively become a vital strategic mechanism for enhancing operational efficiency and supporting strategic initiatives within the FinTech subsector. The emergence of technological tools has created significant opportunities that SMEs use to improve their operations, increase efficiency, and remain competitive in the marketplace (Moreira-Santos, Au-Yong-Oliveira, & Palma-Moreira, 2022). The lack of technological progress is a crucial determinant of the competitive advantage of both local and international organisations (Fedyunina, Dobrosotskiy, & Koval, 2024). The adoption of this advanced technology has become indispensable for companies seeking to remain competitive or expand into new markets, as technology innovation plays a significant role in enhancing a firm's competitive advantage (Vasile & Iriart, 2023).

Digital transformation as a concept defines the incorporation and the systemic use of current digital technologies, such as mobile devices, artificial intelligence, cloud computing, blockchain, and the Internet of Things, and digital marketing into business activities to obtain efficiency, innovation, and growth (Omowole, Adegboyega, Ajibola, & Adedayo, 2024; Mavlutova, Spilbergs, Verdenhofs, Natrins, Arefjevs, & Volkova, 2022). It is a strategy for implementing these technologies in all spheres of a business to achieve significant transformations (Kraus, Durst, Ferreira, Veiga, Kailer, & Weinmann, 2022). Price Waterhouse Coopers (PwC, 2024) asserted that it goes beyond embracing new technological tools; it also involves redesigning operations, strategies, and models for customer engagement and competitiveness in the digital age. Digital transformation tools include, but are not limited to: digital adaptation, transaction automation, and process transformation (Bhuiyan, 2024). Every element focuses on analytics,

people, processes, the Internet of Things, business networks, and systems, all of which are used in harmony to redefine an organisation. It includes these dimensions: Cloud Computing, Big Data Analysis, Internet of Things, artificial intelligence (AI) and machine learning, blockchain, robotic process automation, and cybersecurity solutions (Bhuiyan, 2024).

Operational efficiency is the capacity of an organisation to produce products or services in the most cost-effective, timely, and quality-wise fashion (Mavlutova et al., 2023). Operational efficiency encompasses cost reduction, faster transactions, process optimisation, and improved productivity (Ikhsan & Ginting, 2024). The relationship between digital transformation and operational efficiency has attracted global research attention, particularly in developing economies and industries such as FinTech. FinTech refers to the integration of technology into financial services to enhance ease, effectiveness, and efficiency (Iwedi et al., 2023), representing the fusion of technological innovation with financial systems. According to Otuya, Ofeimun, and Akpotor (2022), FinTech has emerged in response to the fast-paced nature of modern life and improved lifestyle driven by advances in information technology. It enables more efficient financial activities, making payments and transactions faster, more convenient, and more cost-effective.

SMEs are advised to undergo digital transformation by investing heavily in specific technological and organisational skills, such as knowledge management, information processing, and digital networking (Rakibul, Faraji, Rashid, Bhuyan, Hossain, & Ghose, 2024). Digital transformation facilitates the development of new products and strengthens customer communication, thereby enhancing overall organisational performance (Bobro, Lisova, Parfentieva, Dmytrovska, & Kyrylenko, 2025). It also transforms how SMEs conduct business by introducing new selling channels and creating added value to customers (Sharabati, Ali, Allahham, Hussein, Alheet, & Mohammad, 2024). Digitising SMEs will enhance competitiveness and innovation in creating, offering, delivering, and obtaining value. This will assist them in responding more effectively to crises and, in the long run, perform well.

Nevertheless, digital transformation offers significant benefits and presents challenges, particularly for small and medium-sized enterprises, which are under constant pressure to remain innovative and adaptable (Verhoff et al., 2021). Although digital transformation is a theoretically unlimited source in

revolutionising the activities of FinTech SMEs, the process is often hindered by structural and contextual issues (Gkrimpizi, Peristeras & Magnisalis, 2023). The insufficient financial resources can be considered one of these barriers (Gkrimpizi, Peristeras & Magnisalis, 2023). Digital transformation is inherently associated with massive investments in infrastructure, cybersecurity, human resources, and new technologies, including AI, cloud computing, and blockchain (Saeed, Awan, and Qureshi, 2023). The other urgent issue is the lack of digital skills and talent. Numerous FinTech start-ups have challenges attracting and retaining specialists in emerging technologies (Fatorachian, Kazemi, and Shafiei, 2024). There is a shortage of human capital to design, administer, and maintain complicated digital information systems (Omowole et al., 2024). This issue is further complicated by the fact that inadequate training and development programmes are not readily available to address the specific requirements of FinTech companies, specifically, niche training in data science, cybersecurity, and platform integration (Omowole et al., 2024). Resistance to change is also a major factor hindering the slow digital transformation in organisations (Damawan &Azizah, 2020).

Despite the adoption of digital transformation tools and their increasing deployment among FinTech SMEs in Nigeria, there is a gap between digital transformation, utilisation and strategic implementation. The use of tools such as cloud computing, automation, AI, and digital marketing is on the rise, but these tools are not yet applied or integrated into internal business operations (Ehiaghe Odionu & Azubuike, 2024; Bhuiyan, 2024). In addition, the majority of the current studies in Nigeria and other developing economies focus either on general trends of digitalisation (including mobile payment, internet penetration, or broad use of ICTs) or single tools (such as social media marketing (Moreira-Santos, Au-Yong-Oliveira, and Palma-Moreira, 2022) or platform-specific innovations (Moreira-Santos, Au-Yong-Oliveira, and Palma-Moreira, 2022). This scope is quite limited, and there is a gap in how a holistic digital transformation plan, including cloud computing, automation, artificial intelligence, and digital marketing, affects operational efficiency within localised FinTech communities, Yaba. This research, therefore, fills this gap by empirically examining the relationship between the dimensions of digital transformation and the operational efficiency of FinTech SMEs in the Yaba Tech Hub.

The major objective of the study is to examine the effect of digital transformation dimensions on the operational efficiency of FinTech SMEs operating within the

Yaba Tech Hub, Lagos. The following null hypothesis ($H_0$) has been formulated for this study:

**$H_{01}$** There is no significant effect of cloud computing on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos.

**$H_{02}$:** There is no significant effect of automation processes on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos.

**$H_{03}$:** There is no significant effect of artificial intelligence applications on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos.

**$H_{04}$:** There is no significant effect of digital marketing on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos.

## 2.0 Literature Review

### 2.2 Conceptual Review

#### 2.2.1 Digital Transformation

Digital transformation refers to the adoption of contemporary digital technologies, such as mobile devices, artificial intelligence, cloud computing, blockchain, and the Internet of Things, to improve business processes (Omowole, Adegboyega, Ajibola, and Adedayo, 2024). It is a process that strategically implements these technologies within a firm to achieve significant changes, and it's complex, placing human interactions at the centre of focus, alongside technological advancement (Kraus et al., 2022). This transformation not only alters how businesses operate but also affects how people and groups engage with and generate value through technology (Omowole, Adegboyega, Ajibola, & Adedayo, 2024). Digital transformation is a complex process that places human interactions at the centre, alongside technological advancement. To successfully embrace digital transformation, SMEs need to invest in technological and organisational resources, such as knowledge management, information processing, and digital networking (Rakibul, Faraji, Rashid, Bhuyan, Hossain, and Ghose, 2024). Although it is an opportunity, it is also a challenge, particularly for small and medium-sized companies under pressure to innovate and change (Verhoff, Broekhuizen, Bart, Bhattacharya, Dong, Fabian, and Haenlein, 2021).

The problem of digital transformation in small and medium-sized enterprises is the challenge of resistance to change at the individual, group, and system levels (Moreira-Santos, Au-Yong-Oliveira, & Palma-Moreira, 2022). Nevertheless, SMEs find it difficult to organise the implementation of various digital tools (Omowole, Adegboyega, Ajibola, and Adedayo, 2024). As more FinTech companies adopt online platforms to deliver financial services, challenges such as data breaches, fraud, and cyberattacks have become increasingly frequent and severe (Odumuwagun & Oladinni, 2025). Moreover, many SMEs lack the professional expertise, financial resources, and technical capabilities required to implement robust security measures, exposing them to such threats (Odumuwagun & Oladinni, 2025; Gkrimpizi, Peristeras & Magnisalis, 2023). The demand for skilled ICT professionals exceeds the supply (Fatorachian, Kazemi, & Shafiei, 2024). The digital transformation requirements are generally costly in terms of infrastructure, cybersecurity, human resources, and new technologies like AI, cloud computing, and blockchain (Saeed, Awan, & Qureshi, 2023).

The use of digital technology can assist SMEs in developing new products and customer base (Bobro, Lisova, Parfentieva, Dmytrovska, and Kyrylenko, 2025). It also transforms the way SMEs conduct business by providing new avenues of selling and creating value to customers (Sharabati, Ali, Allahham, Hussein, Alheet, & Mohammad, 2024). Going digital will help SMEs remain competitive, innovative, create value, speed delivery, and increase profitability. These enable SMEs to manage crises more efficiently and sustain strong performance over time. Likewise, maintaining competitiveness enhances their ability to adapt smoothly to external disruptions (Kraus et al., 2022)

### 2.2.2 Operational Efficiency

Operational efficiency refers to an organisation's ability to deliver products or services employing minimal resources while maintaining high quality and usability (Oroma et al., 2024). Within FinTech SMEs, operational efficiency refers to the effectiveness of optimising their processes, reducing costs, and improving service delivery through the application of digital solutions (Alfzari & Al-Shboul, 2024). A critical performance measure is a metric that indicates the extent to which a firm can convert inputs such as technology, labour, and capital into outputs in the form of financial transactions, customer engagement, and market expansion (Ikhsan & Ginting, 2024). Digital transformation is a complex matter connected to operational efficiency in FinTech companies (Nwoke, 2024). Technologies such as cloud computing, artificial intelligence, and automation

help eliminate redundant activities, accelerate transaction processing, and reduce overhead (Amajuoyi, Nwobodo & Adegbola, 2024). For example, AI-based systems may be used to automate loan processing and fraud detection. In contrast, cloud platforms may enable 24/7 access to data, thereby enhancing collaboration and real-time decision-making (Amajuoyi, Nwobodo & Adegbola, 2024). Such efficiencies are paramount in start-ups, most of which operate on small budgets and must grow rapidly to remain competitive (Islam et al., 2023). Ahmed-Ishmel et al. (2018) note that the integration of FinTech solutions has led to faster transaction processing and reduced operational burdens for SMEs in Lagos, resulting in measurable performance improvements and enhanced customer service delivery.

Efficiency in operations, however, is not straightforward. Nigeria and Yaba in particular accounts for a high number of FinTech SMEs that are susceptible to systemic challenges, including poor internet connectivity, inadequate power supply, and cybersecurity threats (Yu, Bekerian & Osback, 2024). Such restrictions had the disruptive potency to devastate digital processes and reduce the advantages of otherwise high-technology (Yu, Bekerian & Osback, 2024). Furthermore, limited digital literacy and weak technology management capabilities often prevent SMEs from fully leveraging tools such as artificial intelligence and big data analytics, largely due to existing skill gaps (Bhuiyan, 2024). Digital investments may not yield operational benefits without training and support systems (Álvaro et al., 2024). Regulatory uncertainty is another problem. Although regulation is required to safeguard users and maintain stability of the financial system, continually changing policies may compel SMEs to divert funds budgeted for innovation and efficiency development to regulatory compliance (Rane, Achari, and Choudhary, 2023). This could lead to operational challenges and unwanted spending, minimising the returns projected by digital transformation (Schulze, Townsend & Talay, 2022). According to Ehiaghe *et al*. (2024), operational efficiency is maximised when FinTech companies have a planned approach that encompasses the use of technology, talent and process redesign. This involves the investment in customer service technologies, internal data analytics potential, and workflow automation, all of which lead to quantifiable increases in efficiency.

## 2.4 Digital Transformation Dimensions and Operational Efficiency

### 2.4.1 Cloud Computing and Operational Efficiency

Cloud computing refers to the provision of computing services (servers, storage, databases, networking, software, and analytics) via the internet, local servers and personal devices (Atadoga, Obi, Osasona, Onwusinkwue, Ifesinachi, & Onimisi, 2024). Fundamentally, cloud computing enables companies, including FinTech SMEs, to access and manage essential data and applications from an off-site location, provided there is an internet connection (Atadoga et al., 2024). The functions of the cloud are to enhance workflow, reduce downtime, and enhance operational efficiency. Cloud analytics enables managers to enhance real-time data processing across numerous transactions, customer trends, and system performance, allowing them to make faster alterations and improve service delivery (Jibril, 2024).

The productivity of businesses that built cloud infrastructure was sustained by remote access and virtual continuity of services during the COVID-19 pandemic (Singh, Patel, & Bhatia, 2021). Furthermore, characteristics such as auto-scaling and load balancing help maintain the smooth operation of FinTech systems during periods of high transaction volumes, enhancing speed and reliability—both of which are critical to operational efficiency (Islam, Akinwale, & Duru, 2023). Nevertheless, it is difficult to overstate the effectiveness of cloud computing in terms of stability of the supporting infrastructure (Yousef, Kareem, & Salisu, 2024). Its usefulness can be hindered by poor internet connectivity, the absence of technical competence, and data sovereignty (Yu, Bekerian, & Osback, 2024). It is also observed by Gomez, Manya, and Fransen (2023) that informal coordination arrangements can constrain the effective and consistent adoption of global digital standards, thereby curbing productivity increases by cloud computing.

### 2.4.2 Automation and Operational Efficiency

Automation is the application of technology in processes with minimal human intervention (Elhajjar, Yacoub, & Yaacoub, 2023). Automation in FinTech SMEs entails optimisation of business processes by using software and smart systems to handle mundane tasks, including customer onboarding, transaction processing, compliance reporting, fraud detection, and customer support (Elhajjar *et al*., 2023). Automation is one of the most explicit and quantifiable sources of efficiency in FinTech operations (Olatunji, Akinbami, & Bello, 2025). Automation minimises operational costs, reduces transaction time, and increases

precision by automating repetitive operations through software and algorithms rather than human labour (Elhajjar *et al*., 2023). Nevertheless, process automation can only yield efficiency gains when there is sufficient digital literacy, an organised data infrastructure, and a culture of responsiveness to technological change. Problems that SMEs continue to face include high implementation costs, cybersecurity threats, and resistance to new systems by personnel (Hokmabadi, Rezvani, & De-Matos, 2024). Automation may not solve existing inefficiencies but may introduce new ones unless there is effective change management and workforce training, as asserted by Adewumi, Bakare, and Sodiq (2024).

### 2.4.3 Artificial Intelligence and Operational Efficiency

Artificial Intelligence (AI) is a concept that denotes the imitation of human intelligence in machines programmed to think, learn, and solve problems (Stryker & Kavlakoglu, 2024). It deals with many technologies such as machine learning, natural language processing, computer vision, and deep learning, all of which help systems to process large volumes of data, infer insights, and make decisions with little human intervention (Stryker & Kavlakoglu, 2024). For FinTech SMEs, AI is crucial to changing business models, improving service delivery, streamlining internal operations, and stimulating innovation (Cubric & Li, 2024). Efficiency linked to AI is also applicable to forecasting and risk management. Devices based on algorithms are used to forecast demand patterns, cash flow, and pay flow anomalies by examination of transactional histories (Azuka, Hassan, & Oladunni, 2024). These predictive devices aid decision-making beforehand, minimise downtime, and enhance resource allocation efficiently (Marri, 2025). Harsono and Suprapti (2024) asserted that FinTech SMEs that use AI to issue loans and detect fraud during the process experience shorter turnaround times and enjoy growing customer trust than companies relying on manual methods. Nonetheless, the barriers to AI use are expensive infrastructure, limited data quality, and a lack of skilled personnel (Omokhafe, Adebayo, and Salami, 2024). Nigerian FinTech SMEs often lack in-house data scientists or clean data to train their personnel effectively; therefore, they underutilise them or are biased (Hevner & Storey, 2023).

### 2.4.4 Digital Marketing and Operational Efficiency

Digital marketing is the art of integrating digital technologies and platforms to enhance promotion, services, and brands to target audiences (Bardon, 2024). It includes a wide variety of tools and methods such as social media marketing, search engine optimisation (SEO), email campaign, influencer marketing, content

creation, and paid advertising (Bardon, 2024). For FinTech SMEs, digital marketing is an essential growth-driven capability that enables them to create a larger customer base, brand awareness, and attract customers with limited budgets and resources (Ignatius et al., 2024). In addition to reaching the customers, digital marketing enhances operational efficiency and internal operations by providing analytics and insights. Google Analytics and Meta Business Suite, among others, augment real-time insights concerning customer behaviour, conversion rates, and campaign performance, enabling managers to make timely and informed decisions (Shaheen, 2023). The analytical feedback loop aids swiftness to strategy, where resources are deployed to high-performing activities (Benjamin, Amajuoyi, and Adeusi, 2024). However, the efficacy of digital marketing may be limited by inadequate content-creation capabilities, low digital skills, and unreliable internet access (Kumar, 2022). Additionally, extreme reliance on paid advertising without proper analytics can increase costs rather than reduce them (Dele, 2024).

## 2.5 Conceptual Framework

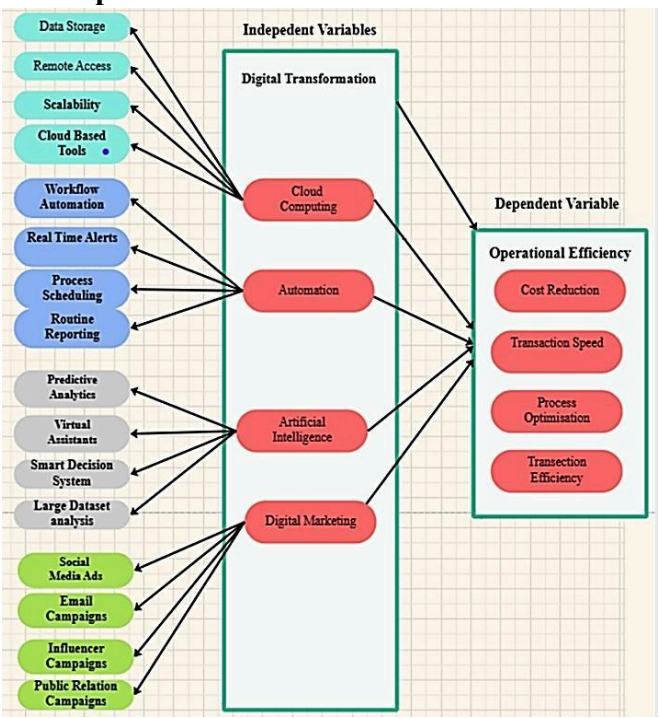


**Figure 2.1:** Conceptual Model (Researchers' Conception, 2025).

The conceptual framework illustrates the proposed relationship between digital transformation and operational efficiency within FinTech. Digital transformation is the independent variable and operationalised through four key dimensions: cloud computing, automation, artificial intelligence, and digital marketing. These dimensions are hypothesised to influence operational efficiency, which represents the dependent variable. Operational efficiency is measured using four indicators: cost reduction, transaction speed, process optimisation, and transaction efficiency. The conceptual model for this study is depicted in *Figure 2. 1*.

## 2.1 Theoretical Review

The two theories that underpin this study are the Digital Transformation Theory and the Resource-Based View Theory (RBVT).

### 2.1.1 Digital Transformation Theory

Digital Transformation Theory offers a conceptual framework that organisations use to understand how technologies could be integrated into their core business models to improve performance and sustain operations over the long term (Schilirio, 2024). Although no single scholar propounded the theory, the concept was extensively developed by Vial (2019; Verhoef et al., 2021). The theory explains how organisations integrate digital technologies into all aspects of their operations to basically change how they create value, deliver services, and interact with stakeholders. It extends beyond mere technology integration to encompass strategic, structural, and cultural changes that enhance innovation, efficiency, and competitiveness (Vial, 2019; Verhoef et al., 2021). Kraus, Durst, Ferreira, Veiga, Kailer, and Weinmann (2022) define digital transformation as a process that enables an entity to undergo major changes in its properties by the integration of information, computing, communication, and connectivity technologies. In a similar vein, Elia et al. (2024) assert that effective digital transformation is impossible without the introduction of new technologies and a comprehensible change in organisational culture, leadership, and business strategy. The theory suggests that companies that implement digital instruments such as cloud computing, automation, artificial intelligence (AI), and digital marketing purposefully achieve measurable results in operational efficiency, through consumer satisfaction, improve decision-making, cost reduction, operations simplification, and real-time interaction with clients and markets and competitiveness in the market (Schilirò, 2024). Researchers use the theory to examine the influence of digital initiatives on productivity, efficiency, and firm performance (Vial, 2019). Applying this theoretical framework will provide

insight into how various aspects of digital transformation affect the operational efficiency of FinTech SMEs in the Yaba Tech Hub, Lagos.

#### 2.1.1.1 Integrating Digital Transformation Theory in the Nigerian FinTech Context

Digital Transformation Theory posits that the adoption and integration of digital technologies primarily reshape organisational processes, value creation, and performance outcomes. In Nigeria's FinTech sector, this transformation is evident in the widespread deployment of mobile platforms, digital payments, and data-driven services geared towards improving financial access and service delivery.

Within this context, a **digital transformation void**—characterised by gaps in digital infrastructure, regulatory inconsistencies, limited digital skills, and uneven technology adoption—creates barriers in the relationship between digital innovation and operational efficiency. While FinTech firms deploy advanced technologies to enhance transaction speed, reduce costs, and optimise processes, the presence of such voids can weaken these outcomes. For illustration, unreliable internet connectivity, cybersecurity concerns, and low levels of digital literacy can hinder seamless operations by limiting productivity gains. Similarly, regulatory uncertainty and infrastructure deficits may slow down the implementation and scalability of digital solutions. As a result, even with significant digital investments, improvements in operational efficiency may not be fully achieved. Thus, in the Nigerian FinTech ecosystem, digital transformation does not automatically translate into operational efficiency; rather, its effectiveness depends upon the extent to which these structural and institutional voids are addressed.

### 2.1.2 Resource-Based View Theory (RBVT)

Resource-Based View (RBVT) of the firm, which was propounded by Penrose in 1959 and expanded by Wernerfelt (1986) and Barney (1991). It is a strategic management theory. It assumes that a firm's internal capabilities and resources are the basis for attaining and sustaining a competitive advantage and improved performance. RBVT assumes that a firm can outperform its rivals when it has resources that are valuable, rare, inimitable, and non-substitutable (VRIN) (Mailani et al., 2024). In the current digital economy, such resources are technological capabilities, data resources, proprietary software, and organisational knowledge linked to digital transformation (Schilirò, 2024). Using FinTech

SMEs, digital transformation resources include: cloud computing, automation technologies, artificial intelligence, and digital marketing infrastructure, which may be regarded as strategic assets that can be deployed and deeply integrated, making them hard to duplicate (Schilirio, 2024). These tools enhance business processes, proficiency, customer satisfaction, flexible service delivery, and agility among SMEs in highly dynamic environments. RBVT is relevant to this study because it explains why some FinTech SMEs outperform others, not simply through the adoption of technology, but through the strategic integration of technology within their internal resource base. For instance, a proprietary AI algorithm or an automation workflow developed within can be a core competency that provides speed, cost reduction, and scalability. Therefore, the RBVT application justifies investigating digital transformation not as a trend but as an opportunity for strategic resource allocation to the success of FinTech SMEs.

## 3. Methodology

The study employed a survey research design, using a cross-sectional approach for data collection. This design facilitated the gathering of data at a single point in time from employees of the selected FinTech companies. A quantitative research method was employed in the study because it allows generalisation from a broader population and ensures reliability. It also enables objective measurement of variables, hypothesis testing, correlations, and statistical analysis of relationships among constructs (Saunders, Lewis, & Thornhill, 2019; Pallant, **2020)**. The study population is staff from three FinTech SMEs located in Yaba Tech Hub, Lagos, Nigeria: Kuda, Paga, and Advansio. The number of staff of the selected firms is 171. These companies were specifically chosen for their active involvement in digital financial services and their utilisation of digital transformation technologies.

### Sample and Data Collection

The Cochran formula for sample size determination was applied. The formula used is as follows:

$$n_o = \frac{(Z^2 \times p \times (1 - p)}{e^2}$$

**Where:**

Z = Z-value for desired confidence level (1.96 for 95%)

p = Estimated proportion of the population with the attribute (0.5 if unknown)

e = Level of significance at 5% (0.05)

$$n_0 = \frac{(1.96)^2 \times 0.5 \times (1 - 0.5)}{(0.05)^2} = \frac{3.8416 \times 0.25}{0.0025} = \frac{0.9604}{0.0025} = 384.16$$

**Finite Population Correction Formula:**

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where:

- $n_0 = 384.16$
- $N = 171$

Substituting the values:

$$n = \frac{384.16}{1 + \frac{(384.16 - 1)}{171}} = \frac{384.16}{1 + 2.24} = \frac{384.16}{3.24} = 118.6$$

Approximated to 120

respondents. n = 120 respondents

This adjustment ensures a representative and statistically sound sample, maintaining a 95% confidence level and 5% margin of error thresholds commonly accepted in social science research (Memon et al., 2020; Ahmed, 2024).

The following formula was used to determine each firm's sample size. The proportional allocation method was applied using the formula: Cn = CN/ N * n/ 1

Where Cn = Estimated staff per company; CN = Population per sampled firms; N = Total population of the study, and n = Sample size of the study.

The proportionate sample size for each organisation was determined as follows:
Kuda Bank: (68 / 171) × 120 = 48 respondents
Paga: (57 / 171) × 120 = 40 respondents
Advansio: (46 / 171) × 120 = 32 respondents

**Table 3.2:** Sample Size Distribution

| Organisations | Proportion (%) | Sample Size |
|---|---|---|
| Kuda Bank | 39.77% | 48 |
| Paga | 33.33% | 40 |
| Advansio | 26.90% | 32 |
| **Total** | **100%** | **120** |

The study employed a multistage sampling technique (Stratified and simple random sampling) because the population is divided into strata, based on departments such as operations, marketing, customer service, ICT, and finance, and each stratum is represented before administering the questionnaire for adequate representation. Data were collected through a structured questionnaire administered to staff of the selected firms using a five-point Likert scale. The response ranged from strongly disagree (1) to strongly agree (5). The questionnaire was divided into Parts A, B, C, D, E, and F. Part A covered demographic information on respondents, the other Parts covered the four constructs of the independent variables, and Part F dealt with the dependent variable. The concepts were cloud computing, automation Processes, artificial intelligence (AI), digital marketing adoption, and operational efficiency. The study adopted Mavlutova, Spilbergs, Verdenhofs, Natrins, Arefjevs, and Volkova (2022); Moreira-Santos, Au-Yong-Oliveira, and Palma-Moreira (2022) s' measurement instruments for both cloud computing and automation processes, with four items each. Otuya, Alonge, and Oluwafemi (2024); Moreira-Santos et al. (2022) on artificial intelligence (AI); Olatunji**, Sajuyigbe, Adeniran, Oluwakayode, and Wahab (2025)** on digital marketing adoption, and Mavlutova et al. (2022) on operational efficiency. The population was stratified according to departments such as operations, marketing, customer service, ICT, and finance.

**Model Specification**

The mathematical model for this study is formulated to examine the effect of digital transformation dimensions, Cloud Computing (CC), Automation (AT), Artificial Intelligence (AI), and Digital Marketing (DM) on Operational Efficiency (OE). The functional form of the model is expressed as:

$$OE = f(CC, AT, AI, DM)$$

The econometric form is specified as:

$OE_i = \beta_0 + \beta_1 CC_i + \beta_2 AT_i + \beta_3 AI_i + \beta_4 DM_i + \mu_i$

Where:

$OE_i$ = Operational Efficiency of the firm

$CC_i$ = Cloud Computing

$AT_i$ = Automation

$AI_i$ = Artificial Intelligence

$DM_i$ = Digital Marketing

$\beta_0$ = Intercept term

$\beta_1$ $\beta_2$, $\beta_3$, $\beta_4$ = Coefficients of the independent variables

$\mu_i$ = Error term

## 4. Results and Discussion

Table 4.1 shows the response rate of the administered copies of the questionnaire. It shows that all 120 distributed copies of the questionnaire were filled correctly and returned, resulting in a 100% response rate. This indicates full participation from the target respondents across the three selected FinTech firms.

**Table 4.1 Response Rate**

| **Firms** | No of Questionnaire Distributed | No of Questionnaire Returned | Percentage of Questionnaire Returned |
|---|---|---|---|
| Kuda Bank | 48 | 48 | 100.0 |
| Paga | 40 | 40 | 100.0 |
| Advansio | 32 | 32 | 100.0 |
| Total | 120 | 120 | **100** |

**Source:** Field Survey, 2025

The impressive response rate can be attributed to the online data collection, which enhanced convenience and flexibility for respondents. A 100% response rate exceeds the acceptable benchmark of 70% naturally required in social science research (Memon, Ting, & Cheah, 2020). This ensures that the data collected are valid, reliable, and representative of the study population.

### 4.1 Demographic Data

Table 4.2 presents the demographic profile of the respondents (N = 120). Females constituted 58.3% and males 41.7%. Most participants were aged 21–30 years (45.8%), followed by 31–40 years (30.0%). The majority held at least a bachelor's degree (75.9%). Respondents were proportionally distributed across Kuda (40.0%), Paga (33.3%), and Advansio (26.7%). Most worked in operations (30.8%) and IT/technical roles (23.3%), enhancing the credibility of responses regarding digital systems implementation.

**Table 4.2:** Demographic Profile of Respondents (N = 120)

| Personal Information | | Frequency | Percentage (%) |
|---|---|---|---|
| **Gender** | Male | 50 | 41.7 |
| | Female | 70 | 58.3 |
| | **Total** | **120** | **100** |
| **Age** | 21–30 years | 55 | 45.8 |
| | 31–40 years | 36 | 30.0 |
| | 41–50 years | 25 | 20.8 |
| | Above 50 years | 4 | 3.3 |
| | **Total** | **120** | **100** |
| **Educational Qualification:** | ND/Diploma | 17 | 14.2 |
| | HND/Bachelor's | 47 | 39.2 |
| | MSc.MA | 44 | 36.7 |
| | Doctorate | 12 | 10.0 |
| | **Total** | **120** | **100** |
| **Organisation** | Kuda Bank | 48 | 40.0 |
| | Paga | 40 | 33.3 |
| | Advansio | 32 | 26.7 |
| | **Total** | **120** | **100** |
| **Job Role** | IT/Technical | 28 | 23.3 |
| | Operations | 37 | 30.8 |
| | Digital Marketing | 24 | 20.0 |
| | Management | 24 | 20.0 |
| | Other | 7 | 5.8 |
| | **Total** | **120** | **100** |

**Source:** Field Survey 2025

### 4.3 Descriptive Statistics

Table 4.3 shows the mean scores and standard deviations of the variables under study, digital transformation measured by cloud computing, automation, artificial intelligence, digital marketing, and operational efficiency, the dependent variable.

The mean of the different items of each construct was computed to obtain the composite means.

**Table 4.3 Descriptive Statistics**

| Construct | Item | Mean | Std. D | N |
|---|---|---|---|---|
| **Cloud Computing** | Secure and scalable cloud storage | 4.02 | 0.820 | 120 |
| | Remote system access via cloud platforms | 3.95 | 0.977 | 120 |
| | Cloud computing improves scalability | 3.98 | 0.889 | 120 |
| | Effective collaboration via cloud tools | 3.86 | 0.901 | 120 |
| | **Composite Mean (Cloud Computing)** | **3.95** | **0.49** | **120** |
| **Automation** | Workflow automation reduces manual intervention | 4.02 | 0.526 | 120 |
| | Automated real-time alerts | 3.99 | 0.542 | 120 |
| | Automation optimises scheduling | 4.01 | 0.572 | 120 |
| | Automated reporting tasks | 4.02 | 0.580 | 120 |
| | **Composite Mean (Automation)** | **4.01** | **0.49** | **120** |
| **Artificial Intelligence** | AI enhances predictive decision-making | 4.00 | 0.449 | 120 |
| | AI handles routine analytics | 4.03 | 0.476 | 120 |
| | AI improves accuracy and speed | 4.04 | 0.474 | 120 |
| | AI reduces human error | 4.00 | 0.485 | 120 |
| | **Composite Mean (Artificial Intelligence)** | **4.02** | **0.41** | **120** |
| **Digital Marketing** | Digital marketing increases customer reach | 3.99 | 0.458 | 120 |
| | Social media improves engagement | 4.01 | 0.440 | 120 |
| | Effective use of online marketing tools | 4.00 | 0.502 | 120 |
| | Digital marketing increases growth | 3.98 | 0.419 | 120 |
| | **Composite Mean (Digital Marketing)** | **4.00** | **0.38** | **120** |
| **Operational Efficiency** | Digital tools reduce operational costs | 4.01 | 0.494 | 120 |
| | Improved transaction speed | 4.06 | 0.473 | 120 |
| | Optimised internal processes | 4.01 | 0.476 | 120 |
| | Increased transaction accuracy | 4.07 | 0.383 | 120 |
| | **Composite Mean (Operational Efficiency)** | **4.04** | **0.39** | **120** |

**Source:** Field Survey 2025

The composite mean values for the variables range from 3.95 to 4.04, indicating a high degree of agreement among respondents. Cloud computing has a composite mean value of (M = 3.95), indicating a significant application has taken place among the firms. The highest mean (M = 4.02) indicates trust in the reliability of cloud infrastructure, and the mean (M = 3.86) indicates a comparatively low level of optimisation in the integration of collaboration. The composite standard deviation (0.49) indicates a moderate consistency in the responses. For

automation, 4.01 composite mean value indicates a high level of automated systems incorporated into operational workflows. Automated reporting and workflow automation were also important (M = 4.02), with low (SD = 0.49), showing uniformity in perceptions. The composite result of 4.02 for Artificial Intelligence was the highest, with AI-developed advances in the accuracy and speed score (M = 4.04). The smallest difference of the (SD = 0.41) coincides with high AI utilisation. The composite mean for digital marketing was high (M = 4.00), while social media engagement recorded a mean score of 4.01. Operational efficiency had the highest composite mean (M = 4.04), driven by transaction accuracy (M = 4.07) and processing speed (M = 4.06). Taken together, the descriptive results reveal that the dimensions of digital transformation are deployed among the sampled FinTech SMEs, and respondents has a positive view of high operational efficiency in their respective organisations. Nevertheless, the descriptive statistics show positive perceptions, but inferential statistics are needed to establish whether the dimensions of digital transformation are significant predictors of operational efficiency.

### 4.3 Reliability and Validity of the Instrument

To assess the internal consistency of the measurement scales, Cronbach's alpha coefficients were computed for all constructs. As presented in Table 4.4, all reliability values exceed the recommended threshold of 0.70, indicating satisfactory internal consistency (George & Mallery, 2020). Cloud Computing recorded the highest reliability (α = 0.925), demonstrating excellent scale consistency. Automation (α = 0.897), Artificial Intelligence (α = 0.889), Digital Marketing (α = 0.857), and Operational Efficiency (α = 0.871) also exhibited strong reliability. These results confirm that the items within each construct consistently measure the same underlying concept.

**Table 4.**4 Reliability Statistics

| Construct | No of Items | Cronbach's Alpha |
|---|---|---|
| Cloud Computing | 4 | 0.925 |
| Automation | 4 | 0.897 |
| Artificial Intelligence | 4 | 0.889 |
| Digital Marketing | 4 | 0.857 |
| Operational Efficiency | 4 | 0.871 |

Source: SPSS Output (2025)

Construct validity was examined using Principal Component Analysis (PCA). As shown in *Table 4.5*, five components with eigenvalues greater than 1 were extracted, consistent with the Kaiser criterion. Collectively, these components explain 76.20% of the total variance, exceeding the recommended 60% threshold and indicating strong explanatory power (Hair et al., 2021). The relatively balanced distribution of variance across components suggests that each construct contributes meaningfully to the measurement model. The use of Varimax rotation further enhances interpretability, and the five-factor solution aligns with the study's theoretical framework.

**Table 4.5:** Total Variance Explained (PCA Results)

| Component | Eigenvalue | % of Variance | Cumulative % |
|---|---|---|---|
| 1 | 3.939 | 19.69 | 19.69 |
| 2 | 3.053 | 15.26 | 34.96 |
| 3 | 2.976 | 14.88 | 49.84 |
| 4 | 2.850 | 14.25 | 64.09 |
| 5 | 2.422 | 12.11 | 76.20 |

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalisation

**Source:** SPSS Output (2025)

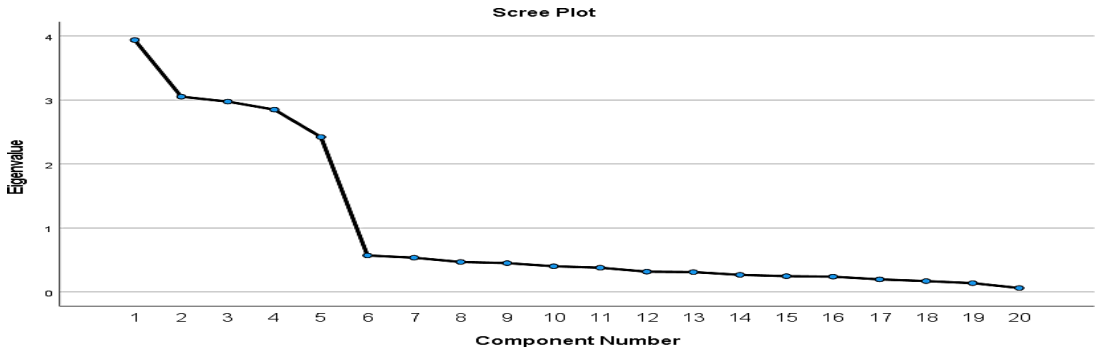


**Figure 4.1**: Scree plot illustrating Eigenvalue Distribution Across Components (SPSS Output, 2025).

*Figure 4.1* presents the scree plot derived from the Principal Component Analysis. A clear inflexion point is observed after the fifth component, indicating

a substantial drop in eigenvalues beyond this point. This visual pattern supports the retention of five components, consistent with the Kaiser criterion (eigenvalues > 1). The scree plot, therefore, confirms the appropriateness of the five-factor solution, cloud computing, automation, AI, digital marketing, and operational efficiency. Overall, the reliability and validity results confirm that the measurement model is statistically robust and suitable for subsequent correlation and regression analysis.

### 4.4 Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships between digital transformation dimensions and operational efficiency. Table 4.6 presents the correlation matrix for the composite variables.

**Table 4.6:** Correlation Matrix

| Variables | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Cloud Computing | Pearson correlation<br>Sig. (2- tailed) | 1<br><br>.033 | | <br><br>.898 | <br><br>.777 | |
| 2. Automation | Pearson correlation<br>Sig. (2- tailed) | -0.195*<br><br>.033 | 1 | <br><br>.992 | <br><br>.282 | |
| 3. Artificial Intelligence | Pearson correlation<br>Sig. (2- tailed) | -0.012<br><br>.898 | -0.001<br><br>.992 | 1 | <br><br>.878 | |
| 4. Digital Marketing | Pearson correlation<br>Sig. (2- tailed) | 0.026<br><br>.777 | -0.099<br><br>.282 | 0.014<br><br>.878 | 1 | |
| 5. Operational Efficiency | Pearson correlation<br>Sig. (2- tailed) | -0.020<br><br>.832 | -0.063<br><br>.494 | 0.003<br><br>.975 | -0.009<br><br>.921 | 1 |

*Note: $p < .05$ (2- tailed)

Table 4.6 shows the correlation matrix. The results indicate that the relationships between digital transformation dimensions and operational efficiency are weak and statistically insignificant ($p > .05$). Cloud Computing ($r = -0.020$), Automation ($r = -0.063$), Artificial Intelligence ($r = 0.003$), and Digital Marketing ($r = -0.009$) all exhibit negligible correlations with operational efficiency.

However, a weak negative correlation was observed between Cloud Computing and Automation ($r = -0.195$, $p < .05$), suggesting a slight inverse relationship between these two constructs. This relationship, although statistically significant, is small in magnitude and does not indicate practical significance. The magnitude remains below the threshold for practical significance (Cohen, 1988). Overall, the findings suggest that while digital transformation practices are exceptionally adopted, their direct linear relationship with operational efficiency is not statistically supported at the correlation level. These results warrant further examination through regression analysis.

## Hypothesis Testing

**$H_{01}$:** There is no significant effect of cloud computing on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos.

The correlation between cloud computing and operational efficiency was weakly negative ($r = – 0.020$, $p = 0.832$). This finding implies that, although cloud adoption improves accessibility and collaboration in practice, these perceived benefits have not yet translated into measurable efficiency gains.

**$H_{02}$:** There is no significant effect of automation processes on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos.

Automation processes exhibited a weak negative relationship with operational efficiency ($r = – 0.063$, $p = 0.494$). This suggests that automation efforts are implemented but have not yielded significant improvements in speed, accuracy, or cost management. In some cases, automation may still be partial or uneven across departments, which could explain the lack of a significant effect.

**$H_{03}$:** There is no significant effect of artificial intelligence applications on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos. For artificial intelligence (AI), the correlation with operational efficiency was almost negligible and positive ($r = 0.003$, $p = 0.975$). This indicates that AI tools and predictive analytics have a limited influence, possibly due to early-stage adoption or insufficient integration with existing business processes.

**$H_{04}$:** There is no significant effect of digital marketing on the operational efficiency of FinTech SMEs operating in the Yaba Tech Hub, Lagos. Digital marketing exhibited a very weak negative correlation with operational efficiency

(r = –0.009, p = 0.921). This indicates that although marketing efforts are digitalised—through social media campaigns, influencer partnerships, and data analytics—their influence on internal operational performance is negligible. Instead, the effects of these activities are more likely to be reflected in customer engagement outcomes than in immediate productivity improvements. In summary, all four null hypotheses ($H_{01}$ – $H_{04}$) are accepted since none of the p-values was below 0.05. The overall result indicates that digital transformation practices are present but not yet optimally aligned with operational efficiency.

### 4.5 Regression Analysis

Multiple regression analysis was conducted to examine the effect of cloud computing, automation, artificial intelligence, and digital marketing on operational efficiency among FinTech SMEs in the Yaba Tech Hub. Operational efficiency was entered as the dependent variable, while the four digital transformation dimensions were entered simultaneously as predictors.

**Table 4.7**: Model Summary for Digital Transformation and Operational Efficiency

| Model | R | R Square | Adjusted R-Square | Std. Error of the Estimate | Durbin–Watson |
|---|---|---|---|---|---|
| 1 | .073 | .005 | -.029 | 0.39499 | 2.002 |

a. Predictors: (Constant), Cloud Computing, Automation, Artificial Intelligence, Digital Marketing

b. Dependent Variable: Operational Efficiency

**Source:** Survey Data (2025)

As shown in *Table 4.7*, the model produced an R value of 0.073, indicating a very weak relationship between digital transformation dimensions and operational efficiency. The $R^2$ value of 0.005 indicates that only 0.5% of the variation in operational efficiency is explained by these digital transformation factors, suggesting that other variables not included in the model explain most of the performance differences. The negative adjusted $R^2$ (–0.029) further confirms the model's weak predictive ability. However, the Durbin–Watson (DW) result of 2.002 falls within the acceptable range (1.5 – 2.5), indicating no significant autocorrelation in the residuals, and the model's assumption of independence is

valid. Overall, the model's explanatory power is statistically insignificant. These results suggest that digital transformation variables do not meaningfully predict operational efficiency. This means that, collectively, cloud computing, automation, artificial intelligence, and digital marketing do not have a measurable predictive effect on operational efficiency. The result reinforces earlier findings that showed weak or negligible associations between the digital transformation constructs and operational outcomes. Therefore, the null hypotheses are upheld, implying no statistically significant combined effect of the independent variables on operational efficiency.

**Table 4.8:** ANOVA for Digital Transformation and Operational Efficiency

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .095 | 4 | .024 | .152 | .962 |
| | Residual | 17.942 | 115 | .156 | | |
| | Total | 18.037 | 119 | | | |

**Source:** Survey Data (2025)

*Table 4.8* presents the ANOVA results for the regression model examining the influence of cloud computing, automation, artificial intelligence, and digital marketing on operational efficiency. The F-statistic value of 0.152, with an associated significance level ($p = 0.962$), far exceeds the 0.05 threshold for statistical significance. This shows that the model as a whole does not significantly predict operational efficiency, and the independent variables collectively fail to provide a meaningful explanation for performance variation across the sampled firms. This result aligns with earlier findings that showed weak or negligible relationships between digital transformation indicators and efficiency outcomes. It suggests that, although FinTech SMEs are embracing technological tools, their implementation may not yet be mature or integrated to yield measurable operational benefits. Consequently, the null hypotheses are retained, confirming that there is no statistically significant combined effect of cloud computing, automation, artificial intelligence, and digital marketing on operational efficiency within the study context.

**Table 4.9: Coefficients of Regression Analysis**

| Variable | Unstandardized Coefficients (β) | Std. Error | Standardised Coefficients (β) | t | Sig. | Tolerance | VIF |
|---|---|---|---|---|---|---|---|
| (Constant) | 4.379 | 0.664 | - | 6.599 | 0.000 | - | - |
| Cloud Computing | –0.016 | 0.045 | –0.033 | -0.347 | 0.729 | 0.962 | 1.040 |
| Automation | –0.057 | 0.076 | –0.071 | -0.746 | 0.457 | 0.953 | 1.049 |
| Artificial Intelligence | 0.003 | 0.089 | 0.003 | 0.028 | 0.978 | 1.000 | 1.000 |
| Digital Marketing | –0.016 | 0.095 | –0.015 | -0.164 | 0.870 | 0.990 | 1.010 |

**Source:** SPSS Output, 2025

Predictors: Cloud Computing, Automation, Artificial Intelligence, and Digital Marketing.

Dependent Variable: Operational Efficiency (OE).

**Table 4.10: Summary of Hypotheses Tested**

| Hypothesis | Paths | Path Coefficient (β) | T-value | Sig. | Result |
|---|---|---|---|---|---|
| $\mathbf{H_{01}}$ | Cloud Computing → Operational Efficiency | -0.033 | -0.347 | 0.729 | Not Supported |
| $\mathbf{H_{02}}$ | Automation → Operational Efficiency | -0.071 | -0.746 | 0.457 | Not Supported |
| $\mathbf{H_{03}}$ | Artificial Intelligence → Operational Efficiency | 0.003 | 0.028 | 0.978 | Not Supported |
| $\mathbf{H_{04}}$ | Digital Marketing → Operational Efficiency | -0.015 | -0.164 | 0.870 | Not Supported |

Dependent Variable: Operational Efficiency

**Source:** Survey Data (2025)

Given the non-significant p-value, the null hypotheses ($H_{01}$, $H_{02}$, $H_{03}$, and $H_{04}$) are not rejected. These imply that cloud computing, automation processes, artificial intelligence applications, and digital marketing do not have a statistically significant influence on operational efficiency within the sampled FinTech SMEs. Although descriptive statistics indicate high levels of digital adoption and

perceived efficiency, the inferential results reveal no measurable predictive relationship. These findings suggest that operational efficiency may be influenced by other structural, managerial, or contextual factors beyond the digital transformation dimensions examined in this study.

### 4.6 Discussion of Findings

The results of the research show that despite digital transformation dimensions, such as cloud computing, automation, artificial intelligence, and digital marketing, adopted by FinTech SMEs in Yaba, do not have a statistically significant direct effect on operational efficiency. This finding is contrary to several empirical findings, Olatunji. *et al*. (2025) and David *et al.* (2021), digital financial technologies considerably increased SMEs' efficiency through the swiftness of transactions and reduction in operational load and costs. *Bhuiyan et al.* (2024) and Mavlutova *et al*. (2023) highlighted that digital transformation increases productivity and boosts cost optimisation. However, current findings corroborate those arguments by Gomez *et al*. (2023), who emphasized that ecosystem processes, informal coordination, and contextual boundaries in Yaba could mediate performance outcomes. Scholarly, the findings contribute to digital transformation theory by challenging its implicit assumption of a linear relationship between technology adoption and efficiency gains. The results demonstrate that digital transformation does not automatically translate into improved operational performance, particularly in contexts characterised by structural and institutional constraints. Drawing on the Resource-Based View (Barney, 1991), the study underscores that digital technologies yield measurable performance outcomes only when they are embedded within valuable, rare, and well-integrated organisational capabilities. This highlights the need to reconceptualise digital transformation as a capability-driven, rather than technology-driven, process.

From a practical perspective, the findings suggest that FinTech managers should move beyond an overreliance on digital infrastructure as a separate solution. Instead, emphasis should be placed on developing internal capabilities, redesigning operational processes, and ensuring alignment between digital initiatives and organisational strategy. Finally, achieving sustainable operational efficiency requires a holistic approach that integrates technological investment with coordinated organisational change, rather than treating digital adoption as an isolated intervention.

## 5. Conclusion and Recommendations

### 5.1 Conclusion

This study examined the effect of digital transformation dimensions, cloud computing, automation, artificial intelligence, and digital marketing, on the operational efficiency of FinTech SMEs in Yaba Tech Hub, Lagos. Although adoption levels were high, regression results indicated no statistically significant direct effect on operational efficiency. These findings challenge dominant assumptions within Digital Transformation Theory that technology adoption inherently produces performance gains (Kraus et al., 2022; Schilirò, 2024). Consistent with the Resource-Based View (Barney, 1991), digital technologies may only generate measurable efficiency improvements when they are embedded as valuable, rare, and strategically managed organisational capabilities. The study therefore concludes that sustainable operational efficiency in FinTech SMEs depends not merely on digital investment, but on strategic alignment, capability development, ecosystem support, and effective process integration within the organisational structure.

### 5.2 Theoretical Implications

Integrating Digital Transformation Theory into the Nigerian FinTech context extends the theory by showing that digital adoption alone does not guarantee improved operational efficiency. Instead, the findings highlight the importance of contextual moderators, such as digital transformation voids (e.g., infrastructural gaps, regulatory inconsistencies, and skill shortages). This suggests that existing theory should move beyond a linear "technology → performance" assumption to a contingency-based perspective, where outcomes depend on environmental and institutional conditions. Furthermore, the results contribute to theory by emphasizing that digital transformation may produce unequal outcomes—strong effects on customer-facing metrics (e.g., engagement, accessibility) but weak or delayed effects on internal operational efficiency. This refines the understanding of how digital value is created and distributed within organisations, particularly in developing economies. The study also strengthens the relevance of institutional theory, indicating that weak institutional backgrounds can constrain the efficiency gains of digital technologies. This provides a basis for integrating Digital Transformation Theory with broader socio-technical and institutional perspectives.

### 5.3 Practical Implications

For FinTech firms in Nigeria, the findings suggest that simply investing in digital tools is insufficient to achieve operational efficiency. Firms should: Invest in complementary capabilities, such as staff digital skills development, process redesign, and cybersecurity systems. Firms should focus on process integration, ensuring that digital solutions are embedded into core operations rather than limited to customer-facing functions. Develop resilience strategies to manage infrastructural challenges, such as unstable internet connectivity and power supply. For policymakers and regulators: The government should strengthen digital infrastructure by providing (reliable internet, power supply) to support seamless FinTech operations, and provide a robust, clear, and consistent regulatory framework to reduce uncertainty and encourage innovation. Sponsor digital literacy and capacity building to enhance the adoption and effective use of FinTech services. Overall, addressing digital transformation voids is critical for translating digital innovation into tangible improvements in operational efficiency within Nigeria's FinTech sector.

### 5.4 Recommendations

FinTech firms in Nigeria should build resilient systems, using multi-cloud infrastructure and USSD/offline options to handle poor connectivity; automate operations by digitising onboarding, employ know your customer (KYC) or sometimes 'know your client', and enhance transaction workflows to reduce manual processes. Train teams in data analytics, cybersecurity, and digital **tools.** Use data actively by tracking KPIs such as transaction time and cost per transaction with real-time dashboards**.** Cybersecurity should be strengthened by implementing multi-factor authentication and regular security audits.

### Limitations and Future Research

This study is subject to several limitations. First, the cross-sectional design limits the ability to draw causal inferences about the relationship between digital transformation and operational efficiency. The relationships observed may evolve, particularly as digital adoption matures within the FinTech sector. Second, the study relies on perceptual and self-reported measures, which may introduce response bias and limit the objectivity of the findings. Third, the focus on Nigerian FinTech firms may constrain the generalisability of the results to other sectors or geographic contexts with different institutional and infrastructural conditions. Additionally, the measurement of digital transformation may not fully capture its multidimensional nature, particularly emerging aspects such as

artificial intelligence and platform ecosystems. Future research should adopt longitudinal designs to capture the dynamic and evolving impact of digital transformation on operational efficiency. There is also a need for comparative studies across countries or industries to examine how varying institutional environments shape these relationships. Further studies could incorporate objective performance data and explore additional moderating variables, such as organisational culture, leadership capabilities, and regulatory quality.

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