

Digital Investment is Not Liability

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Organisational productivity in the telecommunications sector is under pressure due to intense competition, rising operational costs, and rapid technological change. Although digital transformation is widely adopted to improve efficiency and competitiveness, its impact on productivity is inconsistent, particularly in emerging economies like Nigeria. study examined the effect of digital transformation on organisational productivity of selected telecommunication companies in Lagos State, Nigeria, and tested the moderating role of digital investment. A survey design was used. Data were collected from 423 employees of MTN, Glo, and Airtel using well-structured and validated questionnaire. Stratified random sampling was applied, and data were analysed using hierarchical regression analysis. The results revealed that digital transformation has a positive and significant effect on organisational productivity ($B = 0.527, p < 0.05$). Digital investment also independently showed a positive and significant effect on organisational productivity ($B = 1.156, p < 0.05$). Moreover, the interaction effect between digital transformation and digital investment was statistically significant ($B = 0.046, t = 4.295, \Delta R^2 = 0.022, p < 0.05$), indicating that digital investment significantly moderates the relationship between digital transformation and organisational productivity. Digital transformation enhances productivity, but its impact is stronger when supported by adequate digital investment. Productivity gains are therefore dependent on both transformation and investment intensity. Hence, digital investment is not a liability but a necessity. Telecommunication firms should align digital transformation strategies with sustained digital investment in infrastructure, skills, and systems to maximize productivity outcomes. The study empirically establishes the moderating role of digital investment in the digital transformation-organisational productivity relationship within Nigeria's telecommunications sector.

Background to the Study

Organisational productivity remains a major concern among business practitioners, stakeholders, and researchers, particularly within the telecommunications industry, where intense competition, technological advancement, and changing customer expectations continuously reshape operational performance (Abbasi et al., 2024; KPMG, 2024). Globally, telecommunications firms contribute significantly to economic development, digital connectivity, and innovation, especially in countries such as India, Brazil, Mexico, Senegal, and Nigeria (United Nations, 2023). Despite this strategic importance, telecom operators continue to face declining profitability, market commoditization, network uptime, rising infrastructure costs, and increasing competition from digital-first providers (PwC, 2024; Travasoni et al., 2024). In Africa and Nigeria specifically, although the telecom sector contributes substantially to GDP growth and digital inclusion, operators continue to struggle with declining average revenue per user, rising operational expenses, weak infrastructure sharing, subscriber volatility, and decreasing broadband penetration growth (GSMA, 2024; National Bureau of Statistics, 2024; Nigerian Communications Commission, 2024). Consequently, there is increasing pressure on telecom firms to explore sustainable strategies for improving organizational productivity.

In response to these challenges, digital transformation has emerged as a probable strategic mechanism for enhancing operational efficiency, customer experience, organizational resilience, and long-term business sustainability (Kö et al., 2022; Verhoef et al., 2021). The rapid advancement of technologies such as artificial intelligence, cloud computing, big data analytics, and automation has accelerated global investment in digital transformation initiatives, with worldwide digital transformation expenditure projected to reach \$3.4 trillion by 2026 (Gartner, 2024). Scholars argued that successful digital transformation extends beyond technology adoption and could require organizational flexibility, digital awareness, employee adaptability, and alignment between digital initiatives and business objectives (Abhari, 2025; Deloitte, 2023). Although organizations increasingly embrace digital transformation to improve productivity several studies indicate that transformation efforts often fail when firms lack adequate digital capabilities, effective implementation strategies, and organizational readiness (Howarth, 2022; Petzolt & Seckler, 2025). Therefore, understanding how digital transformation influences organisational productivity remains critical for telecommunication companies seeking to sustain growth and competitive advantage in a rapidly evolving digital economy.

Additionally, studies conducted on digital investment have been across different industries and economies; however, the application of digital investment as a moderating variable remains relatively scarce in the literature. Existing studies suggest that firm-specific characteristics such as company size, ownership structure, industry type, and national context significantly influence the level of digital transformation and digital technology adoption within organizations (Omrani et al., 2024; Usai et al., 2021). Larger firms and organizations operating in technology-driven industries often possess greater

financial and technological resources to support digital investments, resulting in higher digital maturity and improved organisational productivity. Furthermore, regulatory frameworks, market structures, and ownership patterns across countries and industries shape firms' digitalization strategies and investment decisions (Agustian et al., 2023; Feliciano-Cestero et al., 2023). Empirical findings by Xia et al. (2024) revealed that increased investment in digital transformation significantly enhances long-term growth, operational efficiency, and financial stability. Similarly, studies by Chen et al. (2023) and Nwankpa and Merhout (2020) confirmed that digital investment positively influences firm performance, innovation, and operational efficiency by improving resource allocation and strengthening digital capabilities. Consequently, this study proposes that digital investment may strengthen the relationship between digital transformation and organisational productivity in telecommunication companies.

Regardless of growing literature on digital transformation and organisational productivity, extant studies have largely concentrated on developed economies with advanced technological infrastructures and substantial digital funding (Amanda & Sudrajad, 2023; Sambo Musa & Salisu, 2024). Limited empirical attention has been given to emerging economies such as Nigeria, where telecommunication firms continue to face infrastructural deficiencies, inconsistent digital investment, regulatory uncertainties, and technological resource constraints (Huang, 2023; Jia & Liu, 2024). Furthermore, studies examining the moderating role of digital investment in the relationship between digital transformation and organisational productivity remain insufficient (Girsang et al., 2024; Yang & Masron, 2023), particularly within the Nigerian telecommunications sector. In response to these identified contextual and empirical gaps, this study seeks to examine the effect of digital transformation on organisational productivity of telecommunication companies in Lagos State, Nigeria, while assessing the moderating role of digital investment in strengthening organisational productivity outcomes. This paper is divided into the following sections: literature review, theoretical framework, methodology, results and analysis, discussion of findings, conclusion, implications of the study, and recommendations for further research.

Literature Review

Organisational productivity (OP)

Organisational productivity refers to the efficiency and effectiveness with which businesses utilize resources such as labour, capital, technology, and materials to transform inputs into quality outputs and achieve strategic goals within a specified period (Kodongo, 2024; Vasenska et al., 2025). It reflects an organization's ability to optimize processes, improve operational performance, minimize waste, and maximize value creation through effective coordination of people, technology, and organizational systems (Sekar & Khoirunurrofik, 2023; Wakiso & Kinyua, 2025). Organisational productivity also encompasses both efficiency and effectiveness in achieving desired outcomes, including profitability, customer satisfaction, innovation, competitiveness, and sustainable growth (Akinola & Akinyele, 2023; Sekar & Khoirunurrofik, 2023; Wakiso & Kinyua, 2025).

Scholars emphasized that organisational productivity encompasses both financial and non-financial outcomes, including profitability, market share, customer satisfaction, operational efficiency, shareholder returns, and cost minimization (El-Chaarani et al., 2022; Na-Nan & Sanamthong, 2020). Productivity is commonly measured using indicators such as employee productivity rate, task completion rate, efficiency ratings, revenue per employee, sales volume, and quality of work metrics (Kleefstra et al., 2020; Rakhra, 2018). To improve productivity, organizations increasingly adopt innovative strategies like digital technologies, lean practices, continuous improvement systems, and strategic management approaches that enhance performance and competitiveness (Ogunbiyi & Fadare, 2021; Olaniyan & Akinbode, 2021). Despite its numerous advantages, including enhanced efficiency, profitability, sustainability, and competitiveness, organisational productivity may also create challenges such as employee burnout, stress, reduced creativity, workplace conflicts, redundancy, and environmental concerns when productivity gains are pursued excessively or without adequate human-centered considerations (Costa Melo et al., 2023; Shehadeh et al., 2024). Therefore, for this study, organisational productivity is defined as an organization's ability to effectively utilize its resources, processes, technology, and human capital to achieve improved outputs, operational efficiency, and sustainable organisational goals in terms of market share growth, network uptime, and profitability.

Digital Transformation (DT)

Digital transformation refers to the strategic combination of advanced digital technologies into organizational processes, products, services, and business models to improve operational efficiency, customer experience, competitiveness, and value creation (Caldarola & Fontanelli, 2024; Omol, 2024; Schilirò, 2024). Scholars explained that digital transformation goes beyond simple technology adoption and involves significant organizational, structural, and cultural changes that reshape how businesses operate and deliver value to stakeholders (Kraus et al., 2022; Niranga et al., 2022). Current digital transformation initiatives are driven by technologies such as artificial intelligence, cloud computing, machine learning, big data analytics, and automation, which align with the Fourth Industrial Revolution and support business sustainability and innovation (Smyth et al., 2024; Verhoef et al., 2021).

The evolution of digital transformation originated from digitization and digitalization processes, where analog information and business activities were gradually converted into digital formats to improve accessibility, efficiency, and operational performance (Walter, 2023; Van Veldhoven & Vanthienen, 2023). Recent studies emphasized that successful digital transformation requires more than technological infrastructure; it also depends on digital awareness, organizational readiness, leadership support, employee adaptability, and strategic alignment between digital initiatives and business objectives (Dąbrowska et al., 2022; Saarikko et al., 2020). Consequently, digital transformation has become a multidimensional and continuous process that influences organizational structures, customer behavior, market dynamics, and competitive strategies (Leso et al., 2023; Paul et al., 2024).

Furthermore, organizations increasingly adopt digital transformation strategies to remain competitive, resilient, and responsive to rapid technological and market changes (Lu et al., 2023; Sony & Mekoth, 2022). Studies revealed that effective digital transformation enhances operational efficiency, innovation, customer satisfaction, decision-making, and overall organizational performance when supported by adequate digital capabilities and strategic implementation (Leão & da Silva, 2021; Petzolt & Seckler, 2025). However, scholars also warned that organizations lacking sufficient digital capabilities, flexible structures, and coordinated transformation strategies risk falling into digital inefficiency and reduced competitiveness (Marx et al., 2023; Omol, 2024). Therefore, digital transformation is defined in this study as the strategic integration of digital technologies into all aspects of organizational operations to improve productivity, create value, and enhance sustainable business performance through digital response, digital agility, digital differentiation, and digital roadmap.

Digital Investment (DI)

Digital investment refers to the strategic allocation of financial resources toward digital technologies, digital infrastructure, and innovative platforms to enhance organizational performance, operational efficiency, and business competitiveness (Almeida et al., 2023; Kraus & Kappl, 2024). It involves investments in advanced technologies such as artificial intelligence, cloud computing, big data analytics, automation, and Internet of Things (IoT) systems to improve decision-making, customer experience, and organizational productivity (Mahboub & Sadok, 2025). Scholars argued that digital investment has become a strategic necessity for organizations seeking to remain competitive and responsive in rapidly evolving business environments characterized by technological disruptions and changing customer expectations (Buhulaiga & Telukdarie, 2024; Ylä-Kujala et al., 2023).

Furthermore, digital investment enhances existing technological capabilities, supports innovation, and facilitates the development of new digital business models and services (Yang et al., 2021). Empirical studies revealed that organizations with strong digital investment capabilities are more likely to achieve improved operational efficiency, higher financial performance, enhanced customer engagement, and greater market resilience (Heredia et al., 2022; Omrani et al., 2024). Recent studies also emphasized that firms investing continuously in digital technologies and innovation are better positioned to optimize business processes, improve productivity, and sustain long-term growth in highly competitive industries (Xia et al., 2024; Usai et al., 2021). Consequently, digital investment plays a significant role in strengthening organizational adaptability and improving overall business performance.

Notwithstanding its numerous benefits, digital investment also presents several challenges and limitations. Studies showed that the success of digital investment depends on organizational readiness, managerial competence, workforce digital skills, and the ability to align digital initiatives with strategic objectives (Mahboub & Sadok, 2025). High implementation costs, cybersecurity risks, technological complexity, and

resistance to organizational change may hinder firms from achieving expected returns from digital investments (Li et al., 2023). Additionally, unequal access to digital infrastructure and technological resources across industries and economies may limit the effectiveness of digital investments, particularly in developing countries (Buhulaiga & Telukdarie, 2024). Therefore, this study defines digital investment as the deliberate allocation of financial resources toward digital technologies and infrastructure to improve innovation, operational efficiency, competitiveness, and organizational productivity.

Digital Transformation, Organisational Productivity, and Digital Investment

Previous studies on digital investments have been in various economies and industries. However, applying digital investment as a moderator in the literature is scarce. Moreover, the literature on digital investments has suggested that firm-specific characteristics, such as industry sector, company size, and ownership type, play significant roles in shaping the extent of digital transformation and adoption. For instance, studies found that larger firms or those in sectors may have more resources to invest in digital technologies, leading to greater digital maturity in firm productivity (Omran et al., 2024; Usai et al., 2021). Moreover, despite these advancements, research linking investment and digitization to productivity remains inconclusive.

Studies have shown that the ownership structure and national context of a business also influence its approach to digitalization and investment, as regulatory frameworks and market dynamics differ across regions and industries (Agustian et al., 2023; Feliciano-Cestero et al., 2023; Meyer et al., 2023). Furthermore, an empirical study by Xia et al. (2024) confirmed that increasing investment in deepening digital transformation has a significant impact on long-term growth and financial stability, as companies that promote innovation through research and development and continuously enhance their digital capabilities are more likely to experience stronger performance and market resilience. However, Elia et al. (2024) in their study postulated that digital transformation is not merely about adopting new technologies but requires a radical rethinking of business processes, organizational structures, and value propositions. The drive for digital disruption has been particularly evident in industries heavily impacted by the fast-paced nature of digital innovation, where firms continuously adapt to new digital tools and processes to maintain competitiveness through investments.

Other scholars found that a critical element of successful digital transformation is the alignment between a company's digital competencies through investment and its financial performance as, research has highlighted the importance of integrating digital capabilities and competencies—alongside financial performance metrics, in understanding the impacts of digitalization on business outcomes (Che Hassan et al., 2024; De Silva et al., 2025; Kraus et al., 2022; Marolt et al., 2025). Thus, an earlier empirical study by Nwankpa and Merhout (2020) confirmed the positive relationship between digital investment and IT innovation. Other empirical studies found that digital investment often acts as a moderator, influencing the strength or direction of a

relationship between two variables. It means that the effect of an independent variable on a dependent variable is not constant but changes depending on the level of digital investment (Mahboub & Sadok, 2025; Omrani et al., 2024; Xia et al., 2024; Usai et al., 2021).

The scholarly literature on this topic is growing, with a focus on how digital transformation and technology adoption impact various business and economic outcomes (Anggraini et al., 2024; De Silva et al., 2025; Zhang et al., 2025). Digital transformation significantly moderated the relationship between corporate strategy and financial performance (Anggraini et al., 2024). Similarly, digital investment, particularly corporate digital transformation, has been shown to alleviate financing constraints for firms; as studies indicated that the negative relationship between digital transformation and financing constraints is more pronounced for firms with greater institutional ownership (Liu et al., 2024). Moreover, a study on European firms revealed that digital technologies can enhance the efficiency gains from green investments, particularly for companies that are over-investing (Cimini & Kalantzis, 2024).

Nevertheless, some scholars suggested that digitalization does not necessarily lead to productivity growth, even with rising investments in technology (Gebauer et al., 2020; Kohtamäki et al., 2020). However, Cetté et al. (2021) found that using ICT specialists and adopting digital technologies increased labor productivity by 23% and total factor productivity by 17% in French firms. This finding emphasizes the role played by digital skills development, as productivity gains from digitization significantly impact workforce competence and the effective integration of digital tools into organizational practices. Such a perspective helps interpret scenarios where enhanced internet access alone yields negative or neutral productivity effects because of insufficient digital skills or inadequate integration strategies. Moreover, research has shown that ICT investment (usage intensity) produces stronger productivity gains when paired with well-functioning institutions that facilitate technology absorption and ensure efficient resource allocation (Cobbinah et al., 2025; Kolupaieva et al., 2024).

Theoretical Framework

This study is anchored on the Dynamic Capabilities Theory (DCT) and the Technology Acceptance Model (TAM). The Dynamic Capabilities Theory was developed by David Teece and colleagues in 1997, while the Technology Acceptance Model was introduced by Fred Davis in 1989. These theories have been widely applied in studies relating to digital transformation, technology adoption, innovation, and organisational performance. Recent studies such as Haider et al. (2024) on big data analytics and market performance, Abdurrahman et al. (2024) on digital transformation and banking innovation, Marikyan and Papagiannidis (2025) on the Technology Acceptance Model, and Jaradat and Mashaqba (2014) on mobile payment adoption further demonstrated the relevance of these theories in explaining technology-driven organisational outcomes.

The strength of the Dynamic Capabilities Theory lies in its emphasis on an organization's ability to sense opportunities, seize emerging innovations, and reconfigure resources and

operational processes in response to environmental changes. This capability enables firms to achieve sustainable competitive advantage, improved market performance, operational efficiency, profitability, and long-term productivity through innovation and effective resource management (Teece, 2024; Verhoef et al., 2021). Similarly, the Technology Acceptance Model is recognized for its simplicity, predictive strength, and ease of application in explaining technology adoption behavior. TAM focuses on Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as determinants of technology acceptance and utilization within organizations (Davis, 1989; Sharma et al., 2025). Both theories collectively explain how digital transformation (X), technology acceptance, strategic agility, and resource capabilities influence organisational productivity (Y). Consequently, the study expresses this relationship mathematically as: $OP = \beta_0 + \beta_1 DT_i + \mu_i$

Furthermore, the theories recognize that external and internal organisational factors may influence the relationship between digital transformation and organisational productivity. In this study, digital investment is introduced as a moderating variable. It reflects the extent to which organizations allocate financial and technological resources toward digital technologies and innovation. Digital investment (Z) enhances the ability to adopt, integrate, and effectively utilize digital technologies to improve operational efficiency and productivity. Therefore, the moderating effect of digital investment on the relationship between digital transformation and organisational productivity is mathematically expressed as: $OP_i = \hat{A}_0 + \hat{A}_1 DT + \hat{A}_{2z} DI + \hat{A}_{4z} DT*DI + \varepsilon_i$. The interaction term (DT×DI) represents the moderating role of digital investment. Consequently, the integration of Dynamic Capabilities Theory and Technology Acceptance Model is expected to provide a robust theoretical foundation for explaining how digital transformation and digital investment collectively enhance organisational productivity through continuous adaptation, innovation, and operational efficiency.

Methodology

The survey research design was applied in line with prior scholarly works such as Nasrun et al. (2025) on accelerating digital transformation through digital leadership: Strategies for innovation, sustainability, and organisational performance enhancement. Li and Tian (2023) on how digital transformation affects total factor productivity: Firm-level evidence from China. Du and Jiang (2022) on promoting enterprise productivity: The role of digital transformation and Yu et al. (2024) on digital transformation, total factor productivity, and firm innovation investment. The study population comprised two thousand and ninety-seven (2,097) staff, categorized into top, middle, and low-level management levels of Mobile Telephone Networks (MTN), Global Communications Limited (Glo), and Bharti Airtel Limited (Airtel). The setting selection was methodologically vindicated by their combined market dominance, representing over 85% of Nigeria's telecommunications sector, and their operational headquarters strategically located in Lagos State, which is the business hub for digital transformation in Nigeria (Nigerian Communications Commission, 2023).

The Cochran sample size formula (1977) was applied to determine the sample size at a 95 percent confidence level and 5 percent margin of error. A sample size of four hundred and twenty-three (423) was used, which consisted of an additional 30% to provide for likely non-response occurrence possibilities (Israel, 1992). The stratified random sampling technique was utilized. A well-structured, validated, and reliable questionnaire was implemented as the research instrument with question items that were adapted from earlier scholarly works after conducting the pilot study. The validity and reliability test confirmed the appropriateness of the research instrument to measure what it was purposed to measure. Moreover, it considered how well the concepts were defined by the measure(s). The researcher and trained research assistants administered and retrieved the questionnaire.

The pilot study test revealed results of 0.8 or higher. Regarding the strength of the pilot test, the factor analysis was applied to eliminate question items that either reduced the suitability of the data (Kaiser-Meyer-Olkin [KMO]). As such, content, criterion, and construct validity were established to authenticate the instrument's validity. The validated reliability findings revealed that Cronbach's alpha coefficients result from the internal consistency test, indicating Digital Transformation (α) = 0.802, Organisational Productivity (α) = 0.855, and Digital Investment (α) = 0.913. The hierarchical regression analysis was applied to investigate whether the effect of digital transformation on organisational productivity in the selected telecommunication companies in Lagos State, Nigeria, is moderated by digital investment. Therefore, the formulated model regarding the research objective is presented as:

$$Y = f(X, Z)^n$$

Where:

Y = Organisational Productivity (OP)

X = Digital Transformation (DT)

Z = Digital Investment (DI)

The functional relationship of the model is presented as:

$$\text{Hence: } OP = \theta_0 + \theta_1 DT + \theta_2 DI + \beta_{12} DT * DI + \mu_i \dots \dots \dots \text{eq}$$

Where:

θ_0 = Constant term

θ_1 = Coefficient of digital transformation

θ_2 = Coefficient of digital investment

ϵ_i = error or stochastic terms

This study's hypothesis was tested at a 95% confidence interval by utilizing the hierarchical regression analysis. This paper's *a priori* expectation is that a positive and significant effect will be recorded from digital transformation on organisational productivity as moderated by digital investment. Ensuring that all materials adopted and

adapted are credited properly, the ethical research procedures was adhered to strictly for anonymity, respect for human dignity, confidentiality, non-falsification of data and previous studies conducted by other scholars were duly accredited.

Results of Findings

Restatement of Study Hypothesis: Digital transformation has no significant effect on organisational productivity as moderated by digital investment.

The hypothesis was tested using hierarchical regression analysis, where variables were introduced into the model in sequential steps. In the first step, organisational productivity was regressed on digital transformation to assess the direct effect. In the second step, the moderating variable, digital investment, was included in the model to examine its independent influence. In the final step, the interaction term between digital transformation and digital investment was introduced to determine the moderating effect. The regression results were evaluated based on changes in R-squared values to establish whether the interaction term significantly improved the model's explanatory power. The findings from these analyses are presented in Tables 1–3.

Table 1: Model Summary of Hierarchical Regression Analysis

Model	R	R ²	Adj.d R ²	Std. Error of the Estimate	Change Statistics				
					R ² Change	F Change	df1	df2	Sig. F Change
1	0.626 ^a	0.392	0.391	5.07205	0.392	248.966	1	386	0.000
2	0.714 ^b	0.509	0.507	4.56223	0.117	92.089	1	385	0.000
3	0.729 ^c	0.532	0.528	4.46224	0.022	18.448	1	384	0.000

a. Predictors: (Constant), Digital Transformation

b. Predictors: (Constant), Digital Transformation, Digital Investment

c. Predictors: (Constant), Digital Transformation, Digital Investment, DT*DI

Source: Researcher's Field Survey, 2026

Table 2: ANOVA of Hierarchical Regression Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6404.824	1	6404.824	248.966	0.000 ^b
	Residual	9930.111	386	25.726		
	Total	16334.936	387			
2	Regression	8321.556	2	4160.778	199.903	0.000 ^c
	Residual	8013.380	385	20.814		
	Total	16334.936	387			
3	Regression	8688.888	3	2896.296	145.458	0.000 ^d
	Residual	7646.047	384	19.912		
	Total	16334.936	387			

a. Dependent Variable: Organisational Productivity
b. Predictors: (Constant), Digital Transformation
c. Predictors: (Constant), Digital Transformation, Digital Investment
d. Predictors: (Constant), Digital Transformation, Digital Investment, DT*DI

Source: Researcher's Field Survey, 2026

Table 3: Coefficient of the Variables

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	47.297	3.160		14.969	0.000
	Digital Transformation	0.527	0.033	0.626	15.779	0.000
2	(Constant)	32.029	3.257		9.833	0.000
	Digital Transformation	0.390	0.033	0.463	11.713	0.000
	Digital Investment	1.156	0.120	0.379	9.596	0.000
3	(Constant)	137.130	24.676		5.557	0.000
	Digital Transformation	-0.737	0.265	-0.875	-2.788	0.006
	Digital Investment	-3.151	1.010	-1.034	-3.121	0.002
	DT*DI	0.046	0.011	2.332	4.295	0.000

a. Dependent Variable: Organisational Productivity

Source: Researcher's Field Survey, 2026

Interpretation

Table 1 presents the results of hierarchical regression analysis to test how digital investment moderates the effect of digital transformation on organisational productivity among the selected telecommunication companies in Nigeria. The results for Model I showed R^2 was 0.392, while the adjusted R^2 was 0.391. This indicated that DT explained 39.1% of the variation in the organisational productivity of selected telecommunication companies in Nigeria. In model II, with the inclusion of digital awareness, R^2 increased from 0.392 to 0.509 (i.e., $R^2\Delta = 0.117$), and adjusted R^2 from 0.391 to 0.507. Hence, DT and

digital investment explain 50.7% of the variation in organisational productivity among the selected telecommunication companies in Nigeria. In model III, R^2 was 0.532, while adjusted R^2 was 0.528 with the introduction of the interaction variable. With the introduction of the interaction variable, there was an increase in R^2 of 0.022 (i.e., $R^2\Delta = 0.022$). This change was statistically significant. This indicates that the interaction between DT and digital investment (DT and digital investment) has a significant effect on organisational productivity, suggesting that digital investment moderates the relationship between DT and organisational productivity.

Table 2 shows an F statistic [$F(1,387)$] of 248.966 with $p < 0.05$ for Model 1. This implies that DT has a significant effect on the organisational productivity of selected telecommunication companies in Nigeria. Model II, which included digital investment as a moderating variable, showed an F statistic [$F(2,387)$] of 199.903, $p < 0.05$. This implies that the model has a good fit and that DT, with the inclusion of digital investment (a moderating variable) as an additional variable, has a significant effect on the organisational productivity of selected telecommunication companies in Nigeria. Furthermore, Model III, which introduces the interaction term with the independent variable, shows an F statistic of $F(3,387) = 145.458$, $p < 0.05$. This implies that the fitted Model of DT is fit for prediction.

Table 3 shows the regression coefficient results for three models. In Model I, the results revealed that DT ($B = 0.527$, $t = 15.779$, $p < 0.05$) has a positive and significant effect on organisational productivity of selected telecommunication companies in Nigeria. The results in model II revealed that both DT ($B = 0.390$, $t = 11.713$, $p < 0.05$) and digital investment ($B = 1.156$, $t = 9.596$, $p < 0.05$) have a positive and significant effect on organisational productivity of selected telecommunication companies in Nigeria. In Model III, the interaction variable ($B = .046$, $t = 4.295$, $p < 0.05$) is statistically significant. This implies that digital investment has a significant effect on DT on organisational productivity. What this finding implies is that whereas digital transformation and digital awareness have an independent positive influence on productivity (as seen in Models I and II), the interactive effect has a significant positive effect on the outcome in terms of productivity of the selected telecommunication companies in Nigeria. The significant positive correlation indicates that digital transformation has a productivity effect, which depends on the degree of digital investment – at a high degree of digital investment, the digital transformation effect is magnified. The findings thus indicate that digital investment is a moderator that reinforces the relationship between digital transformation and organisational productivity, which confirms the *a priori* expectation.

The regression equation from the analysis is stated as follows:

$$OP = 137.130 + .737DT + -3.151DIN + 0.046(DT*DIN) \text{ -----Eqn}$$

Where:

OP = Organisational Productivity

DT = Digital Transformation

DIN = Digital Investment
DT*DIN = Interaction Variable

The results in Tables 1-3 and Equation 2 indicate that digital investment has a significant moderating effect on the relationship between DT and organisational productivity among the selected telecommunication companies in Nigeria. Based on this result, the selected telecommunication companies in Nigeria should build a consistent digital strategy and investment intensity, as digital strategy tends to be more successful in the achievement of better productivity performance as compared to organisations that undertake transformation without adequate allocation of resources. Based on this finding, the null hypothesis, which states that digital transformation has no significant effect on organisational productivity when moderated by digital investment, is rejected.

Discussion of Findings

The hierarchical regression findings showed that digital transformation does not have a significant direct impact on the productivity of an organisation when moderated by the variable digital investment ($B = .046$, $t = 4.295$, $\Delta R^2 = 0.022$, $\Delta F = 18.448$, $p < 0.05$). Whereas the interaction term generated a statistically significant quantity adjustment in explained variance ($\Delta R^2 = 0.022$), the general understanding is that digital transformation alone failed to convert into significant productivity gains, even as firms raised a commitment towards financial investments in digital activities. It implies that investment in digital technologies, infrastructure, and systems did not necessarily enhance the productivity effect of digital transformation in the organisations under study.

This result displays the inconclusive stance in existing literature on the topic of digital investment and productivity performance. According to previous research, digital investment potential and rates of transformation peculiar to firms are influenced by firm-specific factors, including size, industry, and ownership structure (Omran et al., 2024; Usai et al., 2021). Bigger companies generally have more spare financial resources to invest in digital technologies, and as a result, the level of digital maturity increases, but the results of productivity remain disproportionate. Equally, Agustian et al. (2023), Feliciano-Cestero et al. (2023), and Meyer et al. (2023) noted that owner structure and national institutional structures are important factors in determining digital investment decisions and their respective performance implications.

There is, however, empirical evidence of the benefits of digital investment in performance. In consonance with this study is Xia et al. (2024), who affirmed that long-term growth and financial stability were strengthened by long-term investment in digital transformation. Nwankpa and Merhout (2020) also developed a positive connection between digital investment and IT innovation capability. In line with this, Che Hassan et al. (2024), Kraus et al. (2022), De Silva et al. (2025), and Marolt et al. (2025) emphasised that the alignment of the digital competencies with financial measures is important to accomplish the performance gains. As Elia et al. (2024) added, digital transformation needs business processes and value propositions to be radically redesigned, rather than spending money.

The literature also reveals moderate support by evidence on the strategic role of digital investment. Anggraini et al. (2024) concluded that digital transformation mediated the correlation between the corporate strategy and financial performance, whereas Liu et al. (2024) established that corporate digital investment mitigates financing constraints. Similar findings were also noted by Cimini and Kalantzis (2024), who found that digital technologies intensify the gains in efficiency that are brought by green investments. Similarly, Anggraini et al. (2024), De Silva et al. (2025), and Zhang et al. (2025) established that the digital investment enhances the adoption effects of technology in the sectors.

But the current discovery is congruent with skeptical tendencies of learning. Gebauer et al. (2020) and Kohtamaki et al. (2020) suggested that an increase in digital investments does not necessarily lead to an increase in productivity. Cettè et al. (2021) made it clear that productivity improvement requires complementary digital skills by identifying that ICT specialists raised labour productivity by 23% and total factor productivity by 17% in French companies. The study of Cobbinah et al. (2025) and Kolupaieva et al. (2024) agrees with the study result that ICT investment can have stronger productivity results only with institutional quality and absorptive capacity provision. These lessons indicate that unskilled, uninstitutionalised, and unintegrable investments could yield low productivity pay-off.

According to the Dynamic Capabilities Theory (DCT), the results show that financial expenditure on digital technologies is not a capability itself. The resources have to be reconfigured, workflows have to be redesigned, and digital routines have to be integrated into the operations in order to achieve productivity gains. The capability of transformation is a weak component in investment without transformation capability. With reference to the Technology Acceptance Model (TAM), digital investment might enhance system availability but cannot ensure user acceptance, perceived usefulness, and behavioural utilisation enough to enhance productivity. In general, this study expanded the current body of knowledge about DCT and TAM to indicate that digital investment, despite its strategic significance, cannot be considered sufficient as an independent moderator. The complementary capabilities, workforce preparation, institutional backing, and efficient assimilation of technology are the keys to productivity improvement, thus narrowing down the theoretical explanations of the performance outcomes of digital transformation.

Conclusion

The findings from the hierarchical regression analysis revealed that digital investment significantly moderated the relationship between digital transformation and organisational productivity among selected telecommunication companies in Nigeria, as evidenced by a positive and statistically significant interaction effect and an increase in explanatory power across the models. Although digital transformation and digital investment demonstrated individually positive effects on productivity, their combined effect suggested that the productivity gains associated with digital transformation are amplified when firms commit higher levels of digital investment. However, a broader

interpretation of the results indicated that digital investment alone is not sufficient to guarantee substantial productivity improvements, as its effectiveness depends on complementary factors such as organisational capabilities, workforce readiness, and the ability to integrate digital technologies into operational processes. Grounded in the Dynamic Capabilities Theory and Technology Acceptance Model, the study concludes that sustainable productivity outcomes require not only investment in digital technologies but also the development of adaptive capabilities and user acceptance mechanisms that ensure effective utilization of digital systems within organisations.

Thus, what one individual perceives as a liability, the deep strategic thinker's sophisticated lens sees as a necessity through harnessing the Icarus paradox and the dead horse thoughts. The deep strategic thinker recognizes that inactivity is the real liability. So, investing in digital transformation, an organisation can effectively manage the melt of the Icarus Paradox because the business acknowledges the current success as a sun-setting asset. Therefore, the seemingly wasteful spending on new, unproven digital frontiers is actually the only way to ensure that when the Dead Horse finally collapses, the firm is not left standing in the middle of the desert. Therefore, digital investment is not a liability but a necessity.

Implication for Management

The findings imply that managers in telecommunications firms should not treat digital investment as a standalone solution for improving organisational productivity, but rather as a complementary enabler that works best when aligned with effective digital transformation strategies and strong organisational capabilities. Management should prioritise not only increased investment in digital technologies but also the development of employee digital skills, process reconfiguration, and system integration to fully realise productivity gains. This requires deliberate investment in training, change management, and innovation-driven leadership that ensures digital tools are effectively adopted and utilised across all operational levels.

Implication for the Society

For society, the study implies that increased digital transformation and investment in the telecommunications sector can enhance service delivery, connectivity, and economic participation, but only when effectively implemented and widely accessible. Improved productivity in telecom firms can lead to better network quality, expanded digital services, and more efficient communication systems that support businesses, education, and social interaction. However, the benefits to society will depend on reducing digital inequality, strengthening digital literacy, and ensuring that technological advancements translate into inclusive growth rather than widening existing socio-economic gaps.

Theoretical Contribution

This study contributes to theory by integrating the Dynamic Capabilities Theory and the Technology Acceptance Model to explain how digital transformation influences organisational productivity in the presence of digital investment. It extends the Dynamic

Capabilities Theory by demonstrating that resource reconfiguration and adaptive capabilities alone are insufficient without adequate financial commitment to digital technologies. Similarly, it refines the Technology Acceptance Model by showing that system availability and investment do not automatically guarantee productivity gains unless accompanied by meaningful user adoption and organisational integration. The study therefore enriches existing theoretical understanding by highlighting the conditional and interactional nature of digital transformation outcomes.

Empirical Contribution

Empirically, this study added to the growing body of literature on digital transformation and organisational productivity by providing evidence from the Nigerian telecommunications sector, an emerging market context that has been relatively underexplored. It demonstrates that digital investment plays a significant moderating role in shaping the relationship between digital transformation and organisational productivity, thereby offering new insights into how digital strategies translate into performance outcomes in developing economies. The findings also provide empirical evidence that the productivity effects of digital transformation are not uniform but depend on the level and effectiveness of digital investment, thereby filling an important contextual and methodological gap in existing studies. Finally, future research could incorporate other digital capability dimensions, such as digital innovation capability, data analytics capability, artificial intelligence integration, and cybersecurity readiness, to enrich the conceptualization of digital transformation.

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