



## ICT Utilization and Employee Productivity of Selected Information Technology Firms in Lagos State, Nigeria

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### Abstract

*Employee productivity in Information Technology (IT) firms has emerged as a critical determinant of organizational competitiveness in Nigeria's rapidly expanding digital economy. Despite the significant growth of IT firms in Lagos State, many continue to experience suboptimal productivity levels reflected in operational inefficiencies and inconsistent employee output. Evidence from the literature suggests that ICT utilization (communication, internal integration, customer integration, and interorganizational integration) and organizational culture (involvement, consistency, adaptability, and mission) can jointly enhance employee productivity. However, limited empirical studies have examined these relationships within Nigeria's IT sector. Therefore, this study examined the influence of ICT utilization and organizational culture on employee productivity of selected IT firms in Lagos State, Nigeria. This research employed a cross-sectional survey design to investigate employees across five prominent IT companies in Lagos State, Nigeria namely Andela, Paystack, Interswitch, Flutterwave, and Autochek representing a target population of 3,800 employees. A multi-stage sampling technique was employed, and a sample of 400 respondents was drawn using the Taro Yamane formula. Data was collected through a validated structured questionnaire administered online via Google Forms. Cronbach's alpha reliability coefficients for the constructs were 0.969, 0.967, and 0.948 for ICT Utilization, Organizational Culture, and Employee Productivity respectively, all exceeding the 0.70 threshold. A total of 340 valid responses were analysed (response rate: 85.0%). Data were analysed using descriptive and inferential (multiple linear regression) statistics at 5% significance level. The findings revealed that ICT utilization had significant influence on employee productivity ( $Adj.R^2 = 0.369$ ,  $F(4, 335) = 50.572$ ,  $p < 0.05$ ) of selected IT firms in Lagos State, Nigeria. The study concluded that ICT utilization and organizational culture are significant determinants of employee productivity in IT firms in Lagos State, Nigeria. It is recommended that IT firms invest in advanced digital communication and interorganizational ICT tools, while fostering adaptive and involvement-driven organizational cultures to maximize employee productivity. Firms should implement regular digital competency trainings and culture-building initiatives aligned with organizational goals.*

**Keywords:** Communication, Employee Productivity, Internal integration, Integration with customers, ICT Utilization

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### Introduction

Employee productivity refers to the extent to which an IT firm efficiently transforms its human, technological, and organizational inputs into valuable outputs such as completed projects, digital services, and client solutions, relative to

competitors operating within the same industry. It is a key factor for the success and sustainability of companies in a competitive environment. Understanding the factors that influence employee productivity and strategies for its improvement is essential to maintain competitiveness and ensure operational efficiency. Employee productivity, the

backbone of operational success in the IT sector, reflects a firm's ability to efficiently transform resources into high-quality outputs, driving innovation and market competitiveness. Employee productivity encompasses employee output, timely project delivery, and overall firm performance, enabling firms to thrive in a highly competitive environment (Akanbi & Adewoye, 2021; Bifeke & Daniel, 2022).

Globally, growth has slowed in many regions despite accelerated digitalisation and the rise of information technologies. Technological investments often face implementation challenges, and employee productivity gains may lag due to skills gaps and structural issues in firms and economies. Evidence from developing economies, including Nigeria, highlights persistent employee productivity constraints despite Information Communication Technology adoption (Danquah, 2021). In advanced economies such as North America and Europe, digital technologies continue to influence firm-level employee productivity, but aggregate gains vary widely across sectors and firms (Awoyemi & Makanju, 2020). For example, research on firm-level digital adoption in the Netherlands shows that intangible investments including digital skills and software have contributed positively to employee productivity growth, especially in service and younger firms, highlighting the importance of complementary capabilities beyond mere technology investment (Biagi, 2013). In North America, sectors that integrate AI and digital tools intensively including IT services, have experienced above-average employee productivity growth, though this effect remains concentrated among firms with advanced capabilities and skilled workers suggesting that technology alone is insufficient without supporting organizational and human capital factors (Price Water Cooper, 2024).

In Asia, many economies have pursued aggressive digital transformation strategies, blending ICT with innovation policies to enhance employee productivity. The diversity of contexts in Asia with advanced digital hubs like Japan and South Korea alongside rapidly developing markets such as India reveals that employee productivity outcomes depend heavily on factors like digital infrastructure, workforce digital skills, and the capacity of firms to integrate technologies into business processes (Yahaya & Nadarajah, 2023). Meanwhile, in South America, employee productivity challenges in IT-related industries are often shaped by unequal access to digital technologies, limited structured data for advanced analytics (e.g., AI/ML), scarcity of specialised professionals, and financing constraints among small and medium enterprises all of which can hinder full employee productivity realisation from digital investments (Abbasi et al., 2021). Across Europe, employee productivity debates often focus on the European Union-United States employee productivity gap, where Europe's historically higher investment in ICT did not immediately result in proportional employee productivity growth in comparison to the United States. This gap is attributed in part to structural and institutional constraints, varying digital adoption levels among firms, and differences

in complementary assets such as organisational practices and human capital (Biagi, 2013).

In Nigeria, evidence suggests that ICT contributes positively to employee productivity and innovation, yet the economy struggles with broader employee productivity limitations due to ecosystem constraints such as infrastructure deficits and skill shortages. Moreover, employee productivity challenges in Nigeria are structural and widespread, involving factors like inadequate power supply, limited technology penetration, and other business environment constraints that affect firms' output efficiency and competitiveness (Benedicta & Lacheheb, 2022). Small and Medium-sized Enterprises (SMEs), which constitute approximately 90% of Nigeria's businesses but contribute less than 10% to the national Gross Domestic Product (GDP), rely heavily on employee productivity to fuel economic contributions (International Labor Organization, 2022). For IT firms engaged in software development, IT consulting, and digital services, high employee productivity is critical to deliver innovative solutions, meet stringent client deadlines, and maintain competitiveness in local and global markets. Efficient project delivery strengthens client's trust, secures repeat business, and enhances firm reputation, while high employee output enables firms to manage multiple projects simultaneously, boosting profitability (Arsawan et al., 2020). Conversely, low employee productivity results in missed deadlines, subpar outputs, and reduced competitiveness, hindering the growth of Lagos State's IT sector and its potential to drive Nigeria's economic development (Oyelaran-Oyeyinka, 2017).

Lagos State, as the commercial and technological hub of Nigeria, hosts a large concentration of IT firms and startups, often seen as a centre for digital innovation. However, the ecosystem still contends with critical challenges such as infrastructure deficits (including power and connectivity) and talent retention, which influence firm employee productivity (Reuters Financial Times, 2025). These structural challenges can constrain how IT firms leverage ICT and human capital to improve employee productivity, reflecting broader digital divide issues and skill gaps that affect the effectiveness of technology adoption. The influence of employee productivity on IT firms in Lagos State is transformative, shaping their operational success and market positioning in an industry driven by rapid technological advancements (Akanbi & Adewoye, 2021). In software development, high employee productivity manifests as accelerated coding cycles and swift application deployment, enabling firms like Andela to meet client expectations and capture significant market share in sectors such as Fintech and e-commerce (Bifeke & Daniel, 2022). A 2023 study of Nigerian SMEs revealed that firms with optimized development processes achieved 15–20% faster time-to-market, enhancing their ability to compete globally by delivering applications ahead of competitors (Etim et al., 2023). Andela's developers, for example leverage agile methodologies, produce scalable software solutions that have attracted partnerships with global tech giants, boosting Nigeria's reputation as a tech outsourcing hub (Awoloye, 2022).

In IT consulting, employee productivity facilitates efficient problem-solving and project execution, which are vital for client satisfaction and long-term business sustainability, as demonstrated by Interswitch's reliable payment gateway services, which process billions of naira annually with minimal downtime (Arsawan et al., 2020). For SMEs, which dominate Nigeria's IT landscape, employee productivity acts as a critical differentiator, allowing resource-constrained firms to rival larger organizations by maximizing output from limited inputs (Yahaya & Nadarajah, 2023). Recent data underscores this impact: in 2024, Lagos State -based IT SMEs with high employee productivity levels contributed to a 31.6% nominal GDP growth in Nigeria's ICT sector, generating over \$2 billion in economic value through scalable innovations like mobile apps and cloud-based platforms (National Bureau of Statistics, 2025).

Employee productivity of IT firms refers to the extent to which an IT firm efficiently transforms its human, technological, and organizational inputs into valuable outputs, such as completed projects, digital services, and customer solutions, relative to competitors operating in the same industry. Employee productivity of IT firms is measured with operational efficiency and employee output (Odebode et al., 2025). Operational efficiency refers to the extent to which an IT firm designs and executes its work processes in a manner that minimizes waste, reduces delays, and optimally utilizes available resources, including time, digital tools, and technical infrastructure. IT firms operate in fast-paced, project-based environments where inefficiencies quickly translate into missed deadlines, cost overruns, and reduced competitiveness (Nzepang & Nguenda, 2023). High operational efficiency enhances speed, reliability, and scalability, which are essential for sustained employee productivity. On the other hand, employee output refers to the extent to which individual employees in an IT firm consistently produce high-quality work outputs within expected timeframes and performance standards, using available resources effectively (Oladimeji et al., 2023). Despite its transformative potential, achieving optimal employee productivity in Lagos State's IT sector faces contextual challenges, such as infrastructural deficits and skill shortages, which necessitate targeted interventions to sustain and enhance these benefits (Oyelaran-Oyeyinka, 2017). Addressing these challenges requires strategic solutions that leverage technological and organizational dynamics, with ICT utilization serving as a pivotal driver to amplify employee productivity gains in IT firms. Certain factors such as use of ICT and organizational culture could improve the employee productivity of IT firms.

Information and communication technology (ICT) adoption has become a strategic imperative for information technology firms in Lagos State, yet the anticipated improvements in employee productivity remain inconsistently realized across the sector. Although organizations continue to invest substantially in digital platforms and automation tools, effective utilization is frequently constrained by inadequate digital literacy, poor integration with core workflows, persistent infrastructural limitations, and fragmented capacity-

building programs (Akanbi & Adeoye, 2021; Aremu et al., 2021). Recent evidence further indicates that deploying advanced technologies without strategically aligning them with workforce competencies and operational routines often results in tool underutilization, workflow bottlenecks, and stagnant performance outcomes (Yahaya & Nadarajah, 2023; Abbasi et al., 2021). This recurring disconnect between ICT implementation and actual productivity gains reveals a critical empirical gap, particularly within Lagos State's concentrated IT industry, where localized dynamics such as skill alignment, managerial support, and adaptive work practices remain insufficiently examined. Consequently, this study seeks to investigate how specific ICT utilization practices directly influence employee productivity in selected Lagos-based IT firms, generating context-specific evidence to optimize digital workforce performance and guide evidence-based organizational interventions.

## Literature Review

### Concept of Employee Productivity

Employee productivity is widely regarded as a fundamental determinant of economic growth and organizational performance, reflecting the efficiency with which inputs such as labour and capital are transformed into outputs (Oladimeji et al., 2023). At the macroeconomic level, employee productivity is traditionally conceptualized through Total Factor Employee productivity (TFP), which measures the effectiveness of combined inputs in generating output (Fernald, 2014). This conceptualization has been central to understanding growth trajectories in developed economies, where formal production systems and reliable data support aggregate employee productivity analysis (Nordhaus, 2015; Brynjolfsson et al., 2018). At the organizational level, particularly within service-oriented and knowledge-intensive sectors such as information technology, employee productivity extends beyond physical output to include efficiency, quality, timeliness, and value creation. Consequently, employee productivity in IT firms is increasingly viewed as a multidimensional construct that captures both technical and service-based performance outcomes.

The benefits of employee productivity to IT firms cannot be overstated. The literature consistently highlights employee productivity as a key source of competitive advantage and organizational sustainability. Higher employee productivity enables firms to reduce operational costs, improve service quality, meet client deadlines, and enhance market competitiveness (Arsawan et al., 2020). In IT firms, employee productivity gains translate into faster software development cycles, improved innovation capacity, and higher revenue per employee (Bifeke & Daniel, 2022; Okundaye et al., 2020). At the macro level, employee productivity growth contributes to economic diversification, employment creation, and improved living standards. In Africa, digital technologies have enabled employee productivity gains by expanding market access and reducing transaction costs, as evidenced by the success of mobile-based platforms such as M-Pesa in Kenya (Di Vaio et al., 2020; Zhao et al., 2022). In Nigeria, particularly in Lagos

State, high employee productivity among IT firms enhances global competitiveness and positions the sector as a driver of economic transformation (Oyelaran-Oyeyinka, 2017).

Employee productivity is a critical concern in Nigeria's IT sector, which plays a central role in economic diversification efforts. Lagos State, recognized as Nigeria's primary technological and commercial hub, hosts major IT clusters and leading firms such as Andela, Paystack, Interswitch, Flutterwave, and Autochek (Oyelaran-Oyeyinka, 2017). Despite this concentration of innovation, employee productivity in Lagos State's IT firms is constrained by infrastructural deficits, skill gaps, and organizational inefficiencies (International Labour Organization, 2022). Empirical evidence from Lagos State indicates that ICT investments enhance employee output and project delivery performance, particularly among firms adopting cloud-based solutions (Akanbi & Adewoye, 2021). However, these employee productivity gains are often moderated by contextual challenges, highlighting the importance of complementary organizational and cultural factors in realizing the full benefits of ICT utilization.

### Concept of ICT Utilization

Information and Communication Technology (ICT) utilization refers to the extent to which organizations strategically adopt, integrate, and effectively apply digital tools and systems such as cloud computing, Enterprise Resource Planning (ERP) systems, collaborative software, mobile applications, and Artificial Intelligence (AI) to support business operations, decision-making, and service delivery (Adesina & Ayo, 2021). ICT utilization goes beyond mere availability of technology to reflect how frequently, effectively, and meaningfully these tools are embedded in organizational workflows to enhance employee productivity and competitiveness (Ghobakhloo, 2020). In knowledge-intensive sectors such as information technology (IT), ICT utilization is particularly critical because organizational output is highly dependent on digital systems for coordination, innovation, and value creation.

In developing contexts such as Nigeria, ICT utilization plays a strategic role in mitigating structural constraints, including limited infrastructure, skill shortages, and market inefficiencies, which otherwise hinder firm performance and growth (Cuevas-Vargas et al., 2016; Ogunjemilua et al., 2020). The literature commonly conceptualizes ICT utilization using three interrelated dimensions: adoption rates, frequency of use, and perceived usefulness. Adoption rate refers to the proportion of employees actively using specific ICT tools within an organization. Frequency of use captures how often these tools are employed in daily or weekly work activities, while perceived usefulness reflects employees' beliefs regarding the extent to which ICT tools enhance job performance and employee productivity (Yunis et al., 2018).

In IT firms, ICT utilization is further reflected in operational indicators such as reduced project turnaround time, improved task coordination, real-time data access, and enhanced service delivery. Tools such as cloud platforms (e.g., AWS, Microsoft

Azure), project management systems (e.g., Jira, Trello), and collaborative platforms (e.g., Slack, Microsoft Teams) enable organizations to monitor utilization through workflow tracking, system logs, and performance dashboards (Ogunjemilua et al., 2020). These measures are particularly relevant in virtual and distributed work environments where employee productivity depends heavily on digital interaction.

## Theoretical Framework

### Technology Acceptance Model (TAM)

The study is anchored on the Technology Acceptance Model (TAM), which explains user acceptance of information systems through two primary constructs: perceived usefulness, defined as the belief that a technology enhances job performance, and perceived ease of use, the belief that a technology is effortless to use (Davis et al., 1989). These constructs shape attitudes toward technology, influencing behavioral intentions and actual usage, which ultimately impact employee productivity outcomes like task efficiency (Davis, 1986). TAM is highly relevant for assessing ICT utilization in Lagos State's IT firms, where skill shortages and infrastructural constraints hinder adoption (Okundaye et al., 2019). It enables the study to measure how employees in firms like Paystack and Flutterwave perceive tools like APIs and cloud platforms, linking these perceptions to employee productivity outcomes such as project delivery timeliness and employee output (Adesina & Ayo, 2021). TAM's focus on perceived usefulness and ease of use supports hypothesis testing on ICT's impact, particularly in SMEs facing a digital divide (Akanbi & Adewoye, 2021). By quantifying adoption behaviors, TAM provides insights into how firms like Andela enhance efficiency, offering a foundation for policy recommendations to boost ICT training in Nigeria's IT sector (Aremu et al., 2021).

## Methodology

The study adopted a cross-sectional survey research design. The population comprised 3,800 employees from five selected IT firms Andela, Paystack, Interswitch, Flutterwave, and Autochek in Lagos State, Nigeria. A multi-stage sampling technique was employed and a sample of 400 respondents was drawn using the Taro Yamane formula. Data were collected through a validated structured questionnaire administered online via Google Forms. Cronbach's alpha reliability coefficients for the constructs were 0.969, 0.967, and 0.948 for ICT Utilization and Employee Productivity respectively, all exceeding the 0.70 threshold. A total of 340 valid responses were analysed (response rate: 85.0%). Data were analysed using descriptive and inferential (multiple linear regression) statistics at 5% significance level.

## Results Presentation and Discussion of Findings

### Restatement of Hypothesis

**H<sub>0</sub>: ICT utilization does not have a significant influence on employee productivity in the selected Information Technology firms in Lagos State, Nigeria.**

Multiple regression analysis was conducted with the four ICT dimensions as predictors and overall employee productivity as the dependent variable. Results are presented in Table 1.

**Table 1: Multiple regression analysis on ICT utilization and employee productivity in the selected Information Technology firms in Lagos State, Nigeria**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.339	1.670		4.995	.000
	Communication	.472	.223		2.113	.035
	Internal Integration	.223	.184		1.209	.228
	Integration With Customers	.285	.179		1.594	.112
	Inter-organizational Integration	.522	.159		3.283	.001

a. Dependent Variable: Employee productivity  
 $R = 0.614$   $R^2 = 0.376$   $Adj.R^2 = 0.369$   $f(4, 335) = 50.572$

Source: Researcher’s Field Survey (2026)

IOI = Inter-organizational Integration

Table 1 showed the summary of the results for the multiple regression analysis of the effect of ICT utilization on employee productivity of selected Information Technology firms in Lagos State, Nigeria. The result showed that of all the sub-variables of ICT utilization, Communication (B = .472, t = 2.113, p<0.05) and Inter-organizational Integration (B = .522, t = 3.283, p<0.05) have positive and significant effects on employee productivity, while Internal Integration (B = .223, t = 1.209, p>0.05) and Integration With Customers (B = .285, t = 1.594, p>0.05) which have positive but not significant effects on employee productivity. This implies that Communication and Inter-organizational Integration are important factors that can be prioritized as they can positively affect employee productivity of selected Information Technology firms in Lagos State.

The R value of 0.614 supports this result and it indicates that ICT utilization components have a moderate positive relationship with employee productivity of selected Information Technology firms in Lagos State. The coefficient of multiple determination (Adj.R<sup>2</sup> = 0.369) indicates that about 36.9% variations that occur in the employee productivity of selected Information Technology firms can be accounted for by ICT utilization while the remaining 63.1% changes that occur is accounted for by other variables not captured in the model. The predictive and prescriptive multiple regression models are thus expressed:

$$EP = 8.339 + 0.472COM + 0.223II + 0.285IC + 0.522IOI + U_i \text{ --- Eqn(i) (Predictive Model)}$$

$$EP = 8.339 + 0.472COM + 0.522IOI + U_{ii} \text{ --- Eqn(ii) (Prescriptive Model)}$$

Where:

EP = Employee productivity

COM = Communication

II = Internal Integration

IC = Integration with Customers

From the predictive model, only Communication and Inter-organizational Integration have positive and significant effects on employee productivity, hence, these variables should be prioritized. This is why they are included in the prescriptive model. The results of the multiple regression analysis showed that holding ICT utilization at constant zero, employee productivity of selected Information Technology firms will still have positive value of 8.339.

The prescriptive model indicates that when ICT utilization (Communication) is improved by one-unit, employee productivity of selected Information Technology firms would also increase by 0.472, and when Inter-organizational Integration is improved by one-unit, employee productivity would increase by 0.522, and vice versa. This implies that an increase in ICT utilization (Communication and Inter-organizational Integration) would lead to an increase in employee productivity of selected Information Technology firms in Lagos State.

The F-statistics (4, 335) = 50.572 at P<0.05 indicates a significant overall fitness of the model and the significance in predicting the effect of ICT utilization on employee productivity of selected Information Technology firms in Lagos State, Nigeria. Therefore, the null hypothesis which states that there is no significant impact of ICT utilization on employee productivity, was rejected.

### Discussion of Findings

The findings revealed that ICT utilization has a significant influence on employee productivity, leading to the rejection of the null hypothesis (R = 0.614, R<sup>2</sup> = 0.376, F(4, 335) = 50.572). This indicates that approximately 37.6% of the variation in employee productivity is explained by ICT utilization alone. This finding strongly agrees with Nwanmuoh et al. (2024), who revealed that ICT adoption enhances employee productivity and efficiency, and Etim et al. (2023), who found that ICT significantly enhances MSME

performance. The significant effect observed in this study validates the broader African context findings of Nzepang and Nguenda Anya (2023), who demonstrated that internet and telephony use positively affect employee productivity. The strong F-value confirms that ICT tools are not merely present but are actively driving operational efficiency and output in these firms. While the relationship is significant, this study provides nuance compared to sector-specific limitations in prior research. Leo (2022) found a significant positive impact of ICT on public sector employee productivity but noted that cumulative effects depend on past levels; this study confirms the direct significance in the private IT sector without the same public sector constraints. Additionally, Igbomor (2023) found that ICT moderates the relationship between HR practices and performance, but the current study establishes ICT utilization as a direct significant driver. This addresses the gap identified by Gaglio et al. (2022), whose manufacturing focus limits applicability to IT firms. By confirming the significant influence in Lagos IT firms, this study reinforces the recommendation by Nwanmuoh et al. (2024) to invest in ICT training, showing that such utilization directly translates to measurable employee productivity gains.

### Conclusion

The study conclusively establishes that ICT utilization significantly drives employee productivity within selected information technology firms in Lagos State, Nigeria. This outcome affirms that digital tools, automated workflows, and integrated communication platforms are no longer optional accessories but core enablers of efficient task execution, reduced operational delays, and enhanced output quality. In a sector characterized by rapid innovation and intense competition, organizations that strategically align their ICT investments with daily operational processes are better equipped to optimize human capital, foster agile work environments, and sustain long-term performance gains. Ultimately, the findings validate the critical nexus between technological integration and workforce efficiency, positioning ICT adoption as a foundational pillar for organizational success in Nigeria's evolving digital economy.

### Recommendations

In light of these findings, IT firms in Lagos State should prioritize sustained investment in reliable ICT infrastructure, including modern hardware, secure cloud-based systems, and robust network connectivity, while simultaneously addressing potential digital divides among staff. Management must institute continuous, role-specific digital training programs to upskill employees, reduce technology adoption resistance, and ensure optimal utilization of available tools. Additionally, firms should develop clear ICT productivity frameworks that monitor usage patterns, measure performance outcomes, and facilitate timely system upgrades or process realignments. To amplify these organizational efforts, industry regulators and professional bodies in Nigeria should collaborate on policies that expand affordable technology access, subsidize digital competency certifications, and create incentives for firms that demonstrate measurable productivity improvements through strategic ICT deployment.

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